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# LIFT AMERICA: REVITALIZING OUR NATION'S INFRASTRUCTURE AND ECONOMY

## VIRTUAL HEARING

BEFORE THE

## COMMITTEE ON ENERGY AND COMMERCE
## HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

MARCH 22, 2021

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SUBMITTED MATERIAL

H.R. 1848, the Leading Infrastructure for Tomorrow's America Act, submitted by Mr. Pallone[1]


[1]The legislation has been retained in committee files and is available at https://docs.house.gov/meetings/IF/IF00/20210322/111362/BILLS-1171848ih.pdf.

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# LIFT AMERICA: REVITALIZING OUR NATION'S INFRASTRUCTURE AND ECONOMY

**MONDAY, MARCH 22, 2021**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
WASHINGTON, DC.

The committee met, pursuant to call, at 11:01 a.m., via Cisco Webex online video conferencing, Hon. Frank Pallone, Jr. (chairman of the committee) presiding.

Members present: Representatives Pallone, Rush, Eshoo, DeGette, Doyle, Schakowsky, Butterfield, Matsui, Castor, Sarbanes, McNerney, Welch, Tonko, Clarke, Schrader, Cárdenas, Ruiz, Peters, Dingell, Kuster, Kelly, Barragán, Blunt Rochester, Soto, O'Halleran, Rice, Craig, Schrier, Trahan, Fletcher, Rodgers (committee ranking member), Burgess, Latta, Guthrie, McKinley, Griffith, Bilirakis, Johnson, Long, Bucshon, Hudson, Walberg, Carter, Palmer, Dunn, Curtis, Lesko, Pence, Crenshaw, Joyce, and Armstrong.

Staff present: Billy Benjamin, Systems Administrator; Jacquelyn Bolen, Health Counsel; Jeffrey C. Carroll, Staff Director; Jacqueline Cohen, Chief Environment Counsel; Parul Desai, FCC Detailee; Jennifer Epperson, Counsel; Adam Fischer, Professional Staff Member; Waverly Gordon, General Counsel; Tiffany Guarascio, Deputy Staff Director; Anthony Gutierrez, Professional Staff Member; Caitlin Haberman, Professional Staff Member; Perry Hamilton, Clerk; Anne Marie Hirschberger, FERC Detailee; Alex Hoehn-Saric, Chief Counsel, Communications and Consumer Protection; James Johnson, Policy Coordinator; Zach Kahan, Deputy Director, Outreach and Member Service; Rick Kessler, Senior Advisor and Staff Director, Energy and Environment; Mackenzie Kuhl, Digital Assistant; Brendan Larkin, Policy Coordinator; Dustin J. Maghamfar, Air and Climate Counsel; Aisling McDonough, Policy Coordinator; Dan Miller, Professional Staff Member; Elysa Montfort, Press Secretary; Meghan Mullon, Policy Analyst; Joe Orlando, Policy Analyst; Lino Pena-Martinez, Policy Analyst; Kaitlyn Peel, Digital Director; Tim Robinson, Chief Counsel; Chloe Rodriguez, Clerk; Nikki Roy, Policy Coordinator; Andrew Souvall, Director of Communications, Outreach, and Member Services; Medha Surampudy, Professional Staff Member; Terry Sydney, Policy Coordinator; Rebecca Tomilchik, Policy Analyst; Kimberlee Trzeciak, Chief Health Advisor; Tuley Wright, Senior Energy and Environment Policy Advisor; David Brodian, Minority Detailee, Communications and Technology; Sarah Burke, Minority Deputy Staff Director; Michael Cameron, Minority Policy Analyst, Consumer Pro-

tection and Commerce, Energy, Environment; Jerry Couri, Minority Deputy Chief Counsel for Environment; Diane Cutler, Minority Detailee, Oversight and Investigations; William Clutterbuck, Minority Staff Assistant; Theresa Gambo, Minority Financial and Office Administrator; Marissa Gervasi, Minority Counsel, Oversight and Investigations; Grace Graham, Minority Chief Counsel, Health; Caleb Graff, Minority Deputy Chief Counsel, Health; Brittany Havens, Minority Professional Staff Member, Oversight and Investigations; Jack Heretik, Minority Press Secretary; Nate Hodson, Minority Staff Director; Sean Kelly, Minority Press Secretary; Peter Kielty, Minority General Counsel; Emily King, Minority Member Services Director; Bijan Koohmaraie, Minority Chief Counsel; Tim Kurth, Minority Chief Counsel, Consumer Protection and Commerce; Mary Martin, Minority Chief Counsel, Energy and Environment; Brandon Mooney, Minority Deputy Chief Counsel for Energy; Kate O'Connor, Minority Chief Counsel, Communications and Technology; Clare Paoletta, Minority Policy Analyst, Health; Brannon Rains, Minority Professional Staff Member, Consumer Protection and Commerce; Kristin Seum, Minority Counsel, Health; Kristen Shatynski, Minority Professional Staff Member, Health; Olivia Shields, Minority Communications Director; Alan Slobodin, Minority Chief Investigative Counsel, Oversight and Investigations; Peter Spencer, Minority Senior Professional Staff Member, Energy; Michael Taggart, Minority Policy Director; Evan Viau, Minority Professional Staff Member, Communications and Technology; and Everett Winnick, Minority Director of Information Technology.

Mr. PALLONE. The Committee on Energy and Commerce will now come to order. And today, the committee is holding a hearing entitled "LIFT America: Revitalizing our Nation's Infrastructure and Economy." And, of course, due to the COVID–19 public health emergency, today's hearing is being held remotely. All Members and witnesses will be participating via videoconferencing. And as part of our hearing, microphones will be set on mute for purposes of eliminating inadvertent background noise. Members and witnesses will need to unmute their microphones each time they wish to speak. Documents for the record can be sent to Rebecca Tomilchik at the email address we provided to staff, and all documents will be entered into the record at the conclusion of the hearing.

So I am going to start by recognizing myself for 5 minutes for an opening statement.

**OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY**

And as I said, today we begin the process of rebuilding and revitalizing our economy by modernizing our Nation's infrastructure. Over the last year, we have seen the devastating results of inaction: major power outages, water disruptions, healthcare facilities stretched to the limit, and communities left behind due to the digital divide.

The LIFT America Act, which was introduced last week by all 32 committee Democrats, will help build back a better economy. It invests a total of $312 billion in clean and efficient energy, safe

drinking water, expanded access to broadband, brownfields clean-up, and improving our Nation's healthcare infrastructure. This legislation will serve as the blueprint moving forward, and it provides us an opportunity to work together in a bipartisan fashion to deliver a robust and comprehensive infrastructure package. And I am hopeful that we can work together to find bipartisan solutions.

So I want to stress—and I said this to our ranking member—I mean, this is a beginning, you know. We introduced this as Democrats, but we would like to have Republican input into this, you know, before anything moves forward. And there are a lot of bipartisan provisions included in the overall bill in, you know, measures that were introduced by Republicans, so the bill itself does have a number of Republicans initiatives in it.

But be that as it may, we look at this as a work in progress. The LIFT America Act will help us combat the climate crisis by investing more than $69 billion in clean energy and energy efficiency. We include funding to modernize our electric grid to accommodate more renewable energy and make it more resilient, funding to help rapidly deploy new technologies aimed at reducing emissions, and funding for energy efficiency. And, you know, we worked a lot on energy efficiency and resiliency in that energy package, a lot of which was included in the omnibus at the end of the year.

We also invest more than $41 billion in the deployment of electric vehicle infrastructure, including $12.5 billion to accelerate domestic manufacturing of batteries, power electronics, and other technologies for use in plug-in vehicles. Collectively, these investments will help us take an important step in combating the climate crisis while also rebuilding our economy, creating good-paying jobs, and providing much-needed relief to consumers on their energy bills.

We also invest more than $51 billion to protect Americans' drinking water. The legislation extends and increases funding for the State Revolving Loan Fund and other safe water programs targeting lead service lines, water systems resiliency, and water systems security. We also established a new $2.5 billion grant program to help filter toxic PFAS chemicals, or forever chemicals, out of water supplies in affected communities and ensure that water systems in U.S. territories will have access to resources they need.

We also further fund the Brownfields Program, which has successfully helped communities, including many environmental justice communities, clean up contaminated sites, remove public health threats, and prepare the sites for development.

And the LIFT America Act also makes significant investments in the expansion of broadband internet services. We invest $80 billion for the deployment of secure and resilient high-speed broadband. And this allows for 100 percent of broadband deployment across the country, closing the digital divide. Over the last year, we have seen how essential internet connectivity is, and this investment will lead to stronger small businesses and more jobs.

And the legislation also invests $15 billion for the implementation of Next Generation 9–1–1 services that allow callers to send text messages, images, or videos to 9–1–1 in times of emergency. Again, very much a bipartisan initiative. And there is $9.3 billion

for broadband affordability and adoption to ensure that everyone can afford internet services.

And, finally, the LIFT America Act invests $30 billion in our Nation's health infrastructure. The COVID–19 pandemic has exposed an alarming number of preexisting weaknesses in our Nation's healthcare infrastructure, and the pandemic has also stretched our health infrastructure to the breaking point. And this funding will be used to upgrade hospitals and community health centers, improve clinical laboratory infrastructure, support the Indian Health Service, and increase the overall capacity for community-based care in America.

So I don't think there is any better way to stimulate the economy for the future than to modernize our badly aging infrastructure, and I obviously want to work on this together as much as we can over the next few weeks.

[The prepared statement of Mr. Pallone follows:]

## PREPARED STATEMENT OF HON. FRANK PALLONE, JR.

Today, we begin the process of rebuilding and revitalizing our economy by modernizing our Nation's infrastructure. Over the last year, we've seen the devastating results of inaction: major power outages, water disruptions, healthcare facilities stretched to the limit, and communities left behind due to the digital divide.

The LIFT America Act, which was introduced last week by all 32 committee Democrats, will help build back a better economy. It invests a total of $312 billion in clean and efficient energy, safe drinking water, expanded access to broadband, Brownfield cleanups, and improving our Nation's healthcare infrastructure.

This legislation will serve as the blueprint moving forward, and it provides us an opportunity to work together in bipartisan fashion to deliver a robust and comprehensive infrastructure package. I'm hopeful that we can work together to find bipartisan solutions—after all, there are a lot of bipartisan provisions included in this overall bill.

The LIFT America Act will help us combat the climate crisis by investing more than $69 billion in clean energy and energy efficiency. We include funding to modernize our electric grid to accommodate more renewable energy and make it more resilient, funding to help rapidly deploy new technologies aimed at reducing emissions, and funding for energy efficiency.

We also invest more than $41 billion in the deployment of electric vehicle infrastructure, including $12.5 billion to accelerate domestic manufacturing of batteries, power electronics, and other technologies for use in plug-in vehicles.

Collectively, these investments will help us take an important step in combating the climate crisis, while also rebuilding our economy, creating good-paying jobs and providing much needed relief to consumers on their energy bills.

We also invest more than $51 billion to protect Americans' drinking water. The legislation extends and increases funding for the State Revolving Loan Fund and other safe water programs targeting lead service lines, water system resiliency, and water system security. We also establish a new $2.5 billion grant program to help filter toxic PFAS chemicals, or forever chemicals, out of water supplies in effected communities and ensure that water systems in U.S. territories will have access to the resources they need.

We also further fund the Brownfields Program, which has successfully helped communities, including many environmental justice communities, clean up contaminated sites, remove public health threats, and prepare the sites for development.

The LIFT America Act also makes significant investments in the expansion of broadband internet access. We invest $80 billion for the deployment of secure and resilient high-speed broadband that will expand access nationwide. This major investment will allow for 100 percent broadband deployment across the country, closing the digital divide. Over the last year we've seen how essential internet connectivity is, and this investment will lead to stronger small businesses, more jobs and revitalized economies in communities that have simply been left behind for far too long.

The legislation also invests $15 billion for the implementation of Next Generation 9–1-1 services that allow callers to send text messages, images, or videos to 9–1-1 in times of emergency.

We also include $9.3 billion for broadband affordability and adoption to ensure that everyone can afford internet services and have the knowledge and tools to use the internet to meet their needs.

Finally, the LIFT America Act invests $30 billion in our Nation's health infrastructure. The COVID–19 pandemic has exposed an alarming number of pre-existing weaknesses in our Nation's healthcare infrastructure. The pandemic has also stretched our health infrastructure to the breaking point. This funding will be used to upgrade hospitals and community health centers, improve clinical laboratory infrastructure, support the Indian Health Service, and increase the overall capacity for community-based care in America.

There is no better way to stimulate our economy for the future than to modernize our badly aging infrastructure. I encourage my Republican colleagues to join us in this pursuit to revitalize our economy, create millions of new jobs, combat climate change, and ensure no community is left behind. Let's get to work.

Mr. PALLONE. So, with that, I will yield back, and I will recognize Mrs. Rodgers, the ranking member of the committee, for 5 minutes.

## OPENING STATEMENT OF HON. CATHY MCMORRIS RODGERS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mrs. RODGERS. Good morning, Mr. Chairman. Good morning, and to all my colleagues, I will start by reflecting on what life was like before the pandemic. Just over a year ago, our economy was booming. It was the hottest job market in half a century after a decade of people asking "Where are the jobs?," wages were rising. More jobs were available than people looking for work. People were coming off the sidelines. More people, including a record number of women and people with disabilities, were coming off the sidelines. This economic boom was driven by lifting the regulatory burden as opposed to more government mandates and requirements. As a result, there was optimism again. People were hopeful, not fearful.

Today, we should be leading to replicate this success. The hard-working people of this country are anxious for the days when we had hope and optimism driven by jobs, which brings me to this Progressive wish list which is before us today. It is the complete opposite of what will deliver results. It is more regulations and mandates and less freedom to innovate and create jobs.

The LIFT Act was first introduced in 2017 with a price tag of $85 billion. Today, it is a whopping $300 billion for the Government to regulate the cars we drive and how we heat our homes and businesses. This is not the American way. It is another example of how Speaker Pelosi wants to take us back to the Dark Ages, rolling blackouts, uncertainty as to whether the lights will come on when we turn on a light switch, people having to buy generators to ensure heat in their homes.

The LIFT Act will hurt our energy security, affordability, and reliability. It establishes a multibillion-dollar slush fund for the Green New Deal to subsidize the left's mission to nationalize California's downfall. It fails to include solutions Republicans are focused on to secure cleaner American energy, to unleash private investment, and remove barriers for new energy infrastructure and natural gas pipelines, nuclear licensing, and clean, renewable hydropower.

On broadband infrastructure, I will leave it to former FCC Commissioner Michael O'Rielly to explain how this bill wastes billions

without actually closing the digital divide and even setting rural America back further.

Overall, I hope that we can have an honest debate on how this bill forces a regulatory regime and higher costs on Americans who have struggled enough in the worst economic crisis in our lifetime. For our economy to boom again, we should be lifting the regulatory burden. If the majority is sincere about turning this partisan bill bipartisan, we stand ready to engage. We are bringing solutions to the table to secure our clean energy future and boost broadband connectivity. I would offer I am ready. We should be working together rather than holding these virtual hearings where we are all guilty of just making our own points and not listening. I long for the day when we can work to counter the forces that keep us from building trust, better relationships, and workable solutions. May this committee lead something new and lead the way. Thank you.

[The prepared statement of Mrs. Rodgers follows:]

## PREPARED STATEMENT OF HON. CATHY MCMORRIS RODGERS

Good morning.

I'll start by reminding everyone of what life was like before the pandemic. Our economy was booming. It was the hottest job market in half a century.

After a decade of people asking, "where are the jobs?..." wages were rising, more jobs were available than people looking for work, and women drove the labor force comeback.

More people—including a record number of people with disabilities—were coming off the sidelines. This was because we lifted the regulatory burden.

Despite Speaker Pelosi's best efforts to protect the status quo, Republicans delivered on our promises. As a result, there was optimism again in America.

Today, we should be leading to replicate this success. The hardworking people of this country are anxious for those days to return, to reopen, get back to work, and provide for their families

Which brings me to the Progressive wish list before us today. It's the complete opposite of what we know will deliver results. It's more regulations and mandates, and less freedom to innovate and create jobs.

The LIFT Act was first introduced in 2017 with a price tag of $85 billion. Today, it's a whopping $300 billion for the Government to regulate the cars we drive and how we heat our homes and businesses.

This is not the American way. It's another example of how Speaker Pelosi wants to take us back to the Dark Ages.

The LIFT Act will hurt our energy security, affordability, and reliability. It establishes a multibillion-dollar slush fund for the Green New Deal to subsidize the Left's mission to nationalize California's downfall.

It fails to include solutions Republicans are focused on to Secure Cleaner American Energy. To unleash private investment and remove regulatory barriers for new energy infrastructure in natural gas pipelines, nuclear licensing, and clean, renewable hydropower.

On broadband infrastructure, I'll leave it to Former FCC Commissioner Michael O'Rielly to explain how the Majority is preparing to waste billions without actually closing the digital divide and even setting rural America back even further.

Overall, I hope we can have an honest debate on what this bill is about. It forces a new regulatory regime and higher costs on Americans who have already struggled for survival in the worst economic crisis we've seen in our lifetime.

For their sake, to quote "build back better," we should be lifting the regulatory burden. If the Majority is sincere in wanting to turn this partisan bill bipartisan, we stand ready to engage in good faith.

Energy and Commerce Republicans have already introduced several packages of bills to do just that, securing our clean energy future and boosting broadband connectivity.

That's how we ensure our economy booms again.

Thank you.

Mrs. RODGERS. And I am going to yield the remainder of my time to whoever——

Mr. GUTHRIE. Brett Guthrie.

Mrs. RODGERS. Brett Guthrie. Sorry about that.

Mr. GUTHRIE. Thank you, Ranking Member Republican Leader. I want to thank you for yielding.

In order for lessons to be learned from this pandemic on how to strengthen our public health infrastructure, it would be a wasted opportunity not to examine what areas need improvement after being tested from the pandemic of a century and finding solutions to enhance our public health infrastructure. I am pleased the chairman has said that we want to work together with these bills that have been put forward, as he said, from the Democrat perspective.

The current text of the bill is essentially copied and pasted from a 2019 bill. And since the 2019 bill was filed, Congress has provided billions and billions of dollars because of the pandemic in discretionary spending and even more in mandatory spending for States, Federal, and local public health projects. This includes workforce data systems, lab equipment, and some of which we will still spend more than—the moneys 2 years more from now to be spent, according to the CBO. We do need to work together not to authorize duplicate streams of funding but to identify what we need to do as we move forward.

I appreciate the gentlelady for yielding, and I yield back.

[The prepared statement of Mr. Guthrie follows:]

PREPARED STATEMENT OF HON. BRETT GUTHRIE

Thank you for yielding. There are a lot of lessons to be learned from this pandemic on how to strengthen our public health infrastructure. It would be a wasted opportunity to not examine what areas need improvement after being tested from the pandemic of a century and finding solutions to enhance our public health infrastructure. I would like to work together with the majority on well thought out policies.

That's why I am so disappointed the majority put forward bill text on the public health side that was essentially copied and pasted from a 2019 bill. It's unacceptable—and quite frankly lazy—to take this nearly recycled text from before the COVID–19 pandemic and just bump up the funding numbers. My constituents sent me here to be a thoughtful steward of their hard-earned taxpayer money, and the legislation before us flies in the face of that. Congress has provided billions and billions of dollars in discretionary spending and even more in mandatory spending toward Federal, State, and local public health infrastructure projects. This includes workforce, data systems, and laboratory equipment, some of which will still be spent more than two years from now according to CBO. And yet the Democrats want to authorize duplicative streams of funding for nearly identical initiatives, without even bothering to truly understand the need.

We have some time until the COVID–19 money has been fully obligated and spent. This luxury of time will allow us to work together to assess where the gaps are and what will be necessary to maintain the systems we need in a sustainable way. I urge my counterparts to work with us to better understand the needs of our State and local health departments instead of "checking a box" and throwing money at a problem. We must do better than that so we are more prepared for future public health emergencies.

Mr. PALLONE. Thank you.

So what we are going to do now is allocate 5 minutes to each side before we go to our witnesses. And so the Democrats divided it amongst the chairs of jurisdiction. They will get 1 minute each, and then I believe that the Republicans have divided it between two, so they will get like 2½ minutes each.

So, with that, I am going to go through the Democratic 5 minutes and recognize first Mr. Rush, chairman of the Subcommittee on Energy. But each of you guys only have 1 minute.

Mr. Rush.

## OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. Well, thank you, Mr. Chairman. And I want to begin by thanking you for your tenacious leadership in introducing the Leading Infrastructure for Tomorrow's America Act, the LIFT Act. And as chairman of the Energy Subcommittee, this important bill is the top priority for me, especially considering the bill's strong support from all 32 committee members on the Democratic side.

The LIFT America Act makes critical investments to combat the climate crisis, expand broadband internet access, and revitalize America's lagging healthcare infrastructure. This bill also makes a serious and sizable investment to modernize our grid after recent grid failures, improve energy efficiency, and rejuvenate our communities, all while driving job creation. Much-needed investment in these areas will support our Nation in building back better, a top priority——

Mr. PALLONE. Bobby, I have got to interrupt you. Otherwise, the others aren't going to have a chance.

Mr. RUSH. I yield the balance of my time, Mr. Chairman.

[The prepared statement of Mr. Rush follows:]

### PREPARED STATEMENT OF HON. BOBBY L. RUSH

Mr. Chairman, I would like to begin by thanking you for your tenacious leadership in introducing the Leading Infrastructure for Tomorrow's America Act. As the Chairman of the Energy Subcommittee, this important bill is a top priority for me, especially considering the bill's strong support from all 32 Democratic Committee members.

The LIFT America Act makes critical investments to combat the climate crisis, expand broadband internet access, and revitalize America's aging healthcare infrastructure. This bill also makes a serious and sizeable investment to modernize our grid after recent grid failures, improve energy efficiency, and rejuvenate our communities, all while driving job creation.

Much-needed investments in these key areas will support this Nation in building back better—a top priority for both this body and the communities we serve.

And with that, Mr. Chairman, I yield back.

Mr. PALLONE. All right. Thank you. Next, we are going to go to Chairwoman Eshoo.

## OPENING STATEMENT OF HON. ANNA G. ESHOO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Ms. ESHOO. Good morning, colleagues. Over the past year, our country has really undergone profound changes because of COVID–19, and it has laid bare a glaring shortcoming that our Nation's public health infrastructure is outdated and unprepared for crisis.

Today's legislation invests over $36 billion to renovate and modernize public health departments, local hospitals, community health centers, the Indian Health Service, and the public health labs. The bill rebuilds our health system after a year from hell.

As chairwoman of the Health Subcommittee, I am proud that the legislation counteracts our Nation's chronic underfunding of public health and closes the disparities in public health infrastructure and data systems between regions and the IHS.

I am very pleased that two of my bills are included, one that will upgrade thousands of legacy call centers, emergency call centers, and the other protects municipal broadband, which expands access to broadband and offers higher speeds at lower prices. This would really be a vitamin B shot in the arm.

PREPARED STATEMENT OF HON. ANNA G. ESHOO

Over the past year our country has undergone profound changes due to COVID–19 which has laid bare a glaring shortcoming that our Nation's public health infrastructure is outdated and unprepared for crisis.

Today's legislation invests over $36 billion to renovate and modernize public health departments, local hospitals, community health centers, the Indian Health Services and public health labs.

The bill rebuilds our health system after a year from hell.

As chairwoman of the Health Subcommittee, I'm proud that the legislation counteracts our Nation's chronic underfunding of public health and closes the disparities in public health infrastructure and data systems between regions and the IHS.

I'm very pleased that two of my telecom bills are included. The Next Generation 9–1–1 Act provides $15 billion to upgrade thousands of legacy call centers, and the Community Broadband Act protects municipal broadband which expands access to broadband and offers higher speeds at lower prices.

Mr. PALLONE. Anna, I am going to have to interrupt you too.

Ms. ESHOO. I yield back.

Mr. PALLONE. All right.

Next, we have Mr. Doyle.

**OPENING STATEMENT OF HON. MIKE DOYLE, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF PENNSYLVANIA**

Mr. DOYLE. Thank you, Mr. Chairman, for holding the hearing. The LIFT America Act is a transformational investment in the future of our Nation. We have been talking about closing the digital divide for as long as I have been on this committee. For far too many Americans, broadband is unavailable, too slow, or too expensive. This legislation will change all of that by delivering on the promise of universal high-speed broadband for all. We upgrade our Nation's 9–1–1 system, giving our first responders more effective and reliable tools. We make massive investment in upgrading our Nation's water and infrastructure.

Good to see Ernie Moniz and Tom Wheeler here. I will yield back.

PREPARED STATEMENT OF HON. MIKE DOYLE

Mr. Chairman, thank you for holding this hearing.

The LIFT America Act is a transformational investment in the future of our Nation.

We have been talking about closing the digital divide for as long as I have been on this committee—for far too many Americans broadband is unavailable, too slow, or too expensive.

This legislation would change all of that—by delivering on the promise of universal high-speed broadband for all.

The bill would also upgrade our Nation's 9–1–1 systems—giving our first responders more effective and reliable tools to help us in our moments of crisis.

This bill makes a massive investment in upgrading our Nation's water and energy infrastructure—to protect our children, to upgrade our grid, and so much more.

It also invests now in our public health infrastructure—so that we can face the next public health crisis stronger and more prepared.

It's good to see Ernie Moniz and Tom Wheeler back before us.

I look forward to the testimony of our witnesses and I yield back.

Mr. PALLONE. Thank you, Mr. Doyle. Short as always.

And then last is Mr. Tonko.

**OPENING STATEMENT OF HON. PAUL TONKO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK**

Mr. TONKO. Thank you, Mr. Chair.

The LIFT America Act includes important contributions from E&C's subcommittee perspectives. It reauthorizes several drinking water programs, including the Drinking Water State Revolving Fund. It is funded at increasing levels and reaches $5.5 billion annually. This long overdue investment is responsive to EPA's sixth Drinking Water Infrastructure Needs Survey, which found over $470 billion is needed to maintain the Nation's drinking water infrastructure over the next 20 years. LIFT also authorizes $22.5 billion for lead service line replacements. The bill creates a new EPA grant program to reduce emissions from ports and reauthorizes EPA's Brownfields Program at increasing levels, reaching $550 million for fiscal year 2026. It is all about creating jobs and securing a stronger economic development.

Thank you, and I yield back.

PREPARED STATEMENT OF HON. PAUL TONKO

Thank you, Mr. Chairman. The LIFT America Act includes important contributions from the Environment and Climate Change Subcommittee.

It reauthorizes several drinking water programs, including the Drinking Water State Revolving Fund. The SRF is funded at increasing levels and reaches $5.5 billion annually.

This long overdue investment is responsive to EPA's 6th Drinking Water Infrastructure Needs Survey, which found over $470 billion is needed to maintain the Nation's drinking water infrastructure over the next 20 years.

LIFT also authorizes $22.5 billion for lead service line replacements through the SRF with priority given to systems serving disadvantaged communities.

The bill creates a new EPA grant program to reduce emissions from ports and reauthorizes EPA's Brownfields Program at increasing levels, reaching $550 million for fiscal year 2026.

These are critically needed infrastructure investments that will protect public health and our environment while creating jobs and supporting economic development.

I look forward to today's hearing and our future efforts to invest in these programs. I yield back.

Mr. PALLONE. Thank you, Chairman Tonko.

So now we are going to recognize the minority for 5 minutes to be evenly divided between Mr. Latta and Mr. McKinley, and I will recognize Mr. Latta at this point.

**OPENING STATEMENT OF HON. ROBERT E. LATTA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO**

Mr. LATTA. Well, thank you, Mr. Chairman.

During the several Congresses that Republicans led this committee, we have been working with you all to pass substantive bipartisan policies that move the country forward. We are seriously

disappointed we have not been able to reach the same consensus we have had in the past years, and the importance of bipartisanship has been seemingly forgotten.

The issues before us today should not be partisan. They impact Americans in each of our districts, regardless of their political party, and we owe it to them to work together on their behalf. Republicans on this committee recently reintroduced the Boosting Broadcast Connectivity Agenda to help Americans get broadband more quickly, and not a single one of those proposals is included in the legislation before us today.

The same goes for broadband mapping, which has historically been a bipartisan issue. Acting FCC Chairwoman Rosenworcel, who has several times stated "no money before maps," is now saying that it could take up to a year to complete the maps. Yet, here we are today evaluating legislation that pushes $80 billion out the door before the maps are completed. We have made this mistake before, and it appears we could make it again if this legislation proceeds.

Furthermore, it has long been a bipartisan effort to upgrade our 9–1–1 networks to NextGen 9–1–1. In fact, we have been working with you and your staff diligently over last several years on legislation to authorize this program. But in this legislation, you threw away all the bipartisan work. On top of that, I am not convinced that the $15 billion in this bill for NG 9–1–1 will actually accomplish the goal of an interoperable nationwide 9–1–1 network. I could go on, but I will leave it there for now. I am truly disturbed by the actions.

It is clear that this legislation is a partisan wish list. We must strategically and smartly fund programs that have real impact only after evaluating what we have done already in order to see if it is working or not. Unfortunately, this bill does not do that at all but instead throws money thoughtlessly at every problem in hopes that it will be fixed. I can tell you right now that isn't how we make long-lasting solutions.

Mr. Chairman, at this time, I am going to yield the balance of my time to my colleague, the gentleman from West Virginia, Mr. McKinley.

[The prepared statement of Mr. Latta follows:]

PREPARED STATEMENT OF HON. ROBERT E. LATTA

Thank you, Mr. Chairman.

During several Congresses that Republicans led this committee, we were able to work with you all to pass substantive, bipartisan policies to move this country forward.

I am extremely disappointed that we have not been able to reach the same consensus we have had in years past, and the importance of bipartisanship has been seemingly forgotten.

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I yield the remainder of my time to my colleague Mr. McKinley.

Mr. PALLONE. Thank you.

Mr. McKinley is recognized.

## OPENING STATEMENT OF HON. DAVID B. MCKINLEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WEST VIRGINIA

Mr. MCKINLEY. Thank you, Mr. Latta, and thank you, Chairman Pallone.

This massive partisan—partisan—bill seeks to further carry out Biden's environmental agenda, and part of that includes the infrastructure needed for electric vehicles. Look, I am one of those engineers that you mentioned earlier as a civil engineer, that they would be great on the infrastructure, but I am fascinated by the injection of political timelines and ideology into an engineering decision.

Fundamentally transforming our entire transportation away from the dependable internal combustion engine is one thing, and I don't really have a serious problem long term on that, but performing open-heart surgery on such a crucial component of our economy should demand more than an academic exercise. Congress needs to grasp the economic consequences.

So I will ask a number of questions like: How do we ensure a stable and resilient electric grid? What is the impact on jobs in refineries, pipelines, and drilling? How do we develop a domestic battery supply chain? Will America have a reliable source for lithium, cobalt, nickel, and other critical minerals? How do we replace the gasoline tax that will be lost for road maintenance? What about the time lost in recharging stations? What about accounting for the lack of trade-in values for people trying to get rid of their internal combustion engine? They are going to pay—nurses and schoolteachers are going to have to pay 100 percent? Is this another unfunded government mandate? Or what about addressing the increase in landfill waste from batteries and renewable energy pieces?

Wouldn't this transition be less stressful if it occurred using free market forces? Wouldn't that be a novel thing in Washington, to use the free market approach. Not unexpectedly, California and Massachusetts already are banning the sale of cars with internal combustion engines as early as 2035.

So, Mr. Chairman, this debate is no longer the same as legislating against plastic straws and Styrofoam. This is real world, what we are talking about, people's jobs, economy and communities. Congress should find the answers to questions like I have just phrased before we move headlong into something so transformative.

Thank you, Mr. Chairman, and I yield back.

PREPARED STATEMENT OF HON. DAVID B. MCKINLEY

Thank you, Mr. Chairman. this massive, partisan bill seeks to further carry out Biden's environmental agenda, and part of that includes the infrastructure needed for electric vehicles.

As an engineer, I'm fascinated by the injection of political timelines and ideology into this process.

Fundamentally transforming our entire transportation sector away from the dependable internal combusion engine is one thing but performing open heart surgery on such a crucial component of our economy should demand more than an academic exercise. Congress needs to grasp the consequences.

So I will have questions like:

- How to ensure a stable and resilient electric grid;
- The impact on jobs in refineries, pipelines, and drilling;
- How to develop the domestic battery supply chain;
- Will America have a reliable source for lithium, cobalt, nickel, and other critical minerals;
- How to replace the gas tax used for road maintanence;
- What about the time lost in recharging stations;
- Accounting for the lack of trade-in value for internal combustion vehicles;
- Is this another unfunded mandate?
- Or addressing the increase in landfill waste from batteries and renewable energy sources;
- Wouldn't this transition be less stressful if it occurred using free market forces?

Not unexpectedly, California and Massachusetts already plan to ban the sale of cars with internal combustion engines as early as 2035.

So this debate is no longer the same as legislation involving plastic straws and Styrofoam.

Congress should find answer to questions like these, before rushing headlong into something so transformative.

Thank you and I yield back.

Mr. PALLONE. Thank you. So I just want to remind Members that, pursuant to committee rules, all Members' written opening statements shall be made part of the record. So that is the end of our opening statements, but please submit written statements if you like.

And now I am going to introduce our witnesses. I just want to give a little background on each of them. First is the Honorable Ernest Moniz. He is president and chief executive officer of Energy Futures Initiative and, of course, the former Secretary of the U.S. Department of Energy. Then there is Dr. Tom Frieden, who is president and CEO of Resolve to Save Lives, an initiative of vital strategies, and he is former Director also of the Center for Disease Control and Prevention. We have the Honorable Michael O'Rielly, who is a principal of MPOrielly Consulting, LLC, and former Commissioner of the Federal Communications Commission, and the Honorable Tom Wheeler, visiting fellow at the Brookings Institution, senior fellow at Harvard Kennedy School, and of course, former Chairman of the Federal Communications Commission.

So I want to thank all of you for joining us today. We are definitely looking forward to your testimony, and we will start with Dr. Moniz, who is recognized for 5 minutes at this time. Thank you.

**STATEMENTS OF ERNEST J. MONIZ, PH.D., PRESIDENT AND CHIEF EXECUTIVE OFFICER, ENERGY FUTURES INITIATIVES, AND FORMER SECRETARY, DEPARTMENT OF ENERGY; TOM FRIEDEN, M.D., PRESIDENT AND CHIEF EXECUTIVE OFFICER, RESOLVE TO SAVE LIVES, AND FORMER DIRECTOR, CENTERS FOR DISEASE CONTROL AND PREVENTION; MICHAEL P. O'RIELLY, PRINCIPAL, MPORIELLY CONSULTING, LLC, VISITING FELLOW, HUDSON INSTITUTE, AND FORMER COMMISSIONER, FEDERAL COMMUNICATIONS COMMISSION; AND TOM WHEELER, VISITING FELLOW, BROOKINGS INSTITUTION, SENIOR FELLOW, HARVARD KENNEDY SCHOOL, AND FORMER CHAIRMAN, FEDERAL COMMUNICATIONS COMMISSION**

**STATEMENT OF ERNEST J. MONIZ, Ph.D.**

Dr. MONIZ. Thank you, Mr. Chairman, Ranking Member Rodgers, members of the committee, for this opportunity to discuss the LIFT America Act. Coming on the heels of the disaster in Texas, this hearing and the LIFT America Act's focus on improving the Nation's energy infrastructure is very timely. We made energy infrastructure an early priority in my tenure as Energy Secretary with development of the Quadrennial Energy Review, and I am pleased to see close alignment with the LIFT America Act.

The urgency of upgrading our energy infrastructure in a changing climate is painfully clear. The weather patterns of the past are not adequate to inform those of the future, and this profoundly affects infrastructure planning.

In looking ahead to infrastructure needs, it is useful to note a number of technologies that will drive major infrastructure needs.

Electricity and the grid: A reliable and resilient grid is the infrastructure on which others depend.

Electrification of other economic sectors, especially transportation and a continental scale charging infrastructure.

Large-scale carbon management: CCUS and gigaton scale and several carbon dioxide removal pathways will depend on large-scale carbon management infrastructures.

Fuels that complement fuel electricity: A low carbon fuel will be needed, and hydrogen is the most likely candidate, requiring yet another major infrastructure.

In this opening statement, I will highlight only a few of the observations and recommendations in my written testimony. Electricity grid modernization must reach multiple objectives, but transmission buildout is challenging. Permitting could be streamlined in a number of ways in a broad stakeholder process, such as harnessing existing rights-of-way, and Congress could initiate a review of Federal policy on wholesale market design.

Electric vehicle infrastructure must be scaled up rapidly in the next 3 to 5 years, consistent with social equity. Battery supply is also a critical need. Incentives for domestic battery manufacturing and IP protection in an area of intense international competition

are critical. Battery supply considerations illustrate the importance of supply chains for critical metals and minerals, such as lithium and cobalt, suggesting development of sustainable domestic mining. Offshore wind is a good example of the importance of infrastructure planning to enable a critical low-carbon pathway and create lots of good jobs. New Federal policy for transmission system buildout could include expanding DOE's loan program funding to enable offshore wind, extending investment tax credits, and reinstating 48C, advanced energy manufacturing tax credits. Decarbonization of port infrastructure operations through electrification or use of hydrogen or other net-zero carbon fuels should be integral to infrastructure modernization.

For the natural gas system to be leveraged as part of the clean energy transition, its emissions must be reduced to meet climate policy targets. Greatly reducing methane emissions deserves full commitment from industry. Hydrogen is a clean energy carrier with multiple applications across every sector of the economy. The infrastructures needed for hydrogen market formation tend to be highly regional. Finding synergies with other infrastructure needs for achieving deep decarbonization could lower the overall development costs of a hydrogen-fueled economy. Federal and State governments should work together to incentivize early mover hydrogen $CO_2$ hubs perhaps through approved multistate regional compacts. Carbon capture utilization and storage will be an essential element in any portfolio of actions for meeting a mid-century net-zero goal. Congressional action to encourage repurposing of existing rights-of-way to allow for $CO_2$ pipelines to colocate with other infrastructures would be beneficial. DOE's CarbonSAFE program could be enhanced and accelerated to advance geologic storage hubs. New business models could encompass creation of third-party carbon management entities, perhaps a $CO_2$ utility model transitioning firms and workers with expertise in managing fossil fuel production and processing.

Energy infrastructures are also increasingly dependent on digital technologies, making broadband access a critical part of modernizing those infrastructures. Smart cities and communities should focus on the digital backbone infrastructure, integrated smart electricity and telecommunications systems linked to Big Data sensors, real-time modeling, and artificial intelligence capabilities.

In concluding, I will note two broad themes. First is unequivocal support for a focus on good jobs as part of any successful climate action and clean energy infrastructure plan. At EFI, we have partnered with the AFL–CIO to form the Labor Energy Partnership. Without attention to jobs, we will face unnecessary headwinds in reaching our climate goals.

Second, we strongly support a regional focus for solutions to climate change and the associated energy infrastructure needs. A one-size-fits-all approach to policy and financial support will likely impede, not accelerate, progress towards deep decarbonization.

Mr. Chairman, Ranking Member Rodgers, members of the committee, the LIFT America Act is a very important and necessary step towards supporting the infrastructure we need for deep decarbonization of energy systems and for building resilience into

our infrastructures in anticipation of increasingly extreme weather patterns. I look forward to your questions.

[The prepared statement of Dr. Moniz follows:]

**Testimony of Secretary Ernest Moniz before the House Committee on Energy and Commerce**

**"Energy Infrastructure Modernization is Critical for Addressing Climate Change, Energy Security, and Jobs"**

**March 22, 2021**

Mr. Chairman, ranking member Rodgers, members of the Committee, thank you for the opportunity to testify today and to discuss the LIFT America Act.

Coming on the heels of the disaster in Texas, this hearing and the LIFT America Act's focus on improving the nation's energy infrastructure, is very timely. The recent events in Texas serve as a wakeup call for many things Congress should consider and address as it works to help modernize the nation's energy infrastructure.

The Texas experience puts an exclamation point on a broad range of domestic and global activities and actions now underway. As we all know, the Biden Administration has re-joined the Paris Agreement and is working to develop a new NDC for the United States. In addition, roughly 130 of 196 nations around the world have committed to or are actively considering net zero emissions targets by mid-century. More than half of the U.S population lives in a state or city with an emissions reduction target of 80% or greater by midcentury. Also, the European Union is developing a carbon border adjustment policy scheduled to be released this summer. And finally, the COVID pandemic serves as a constant and critical reminder of the ongoing need for jobs and the almost unparalleled need to support an economic recovery plan.

**Text Box 1. QER 1.1 Highlighted Gas/Electric Infrastructure Interdependencies**

**The Big Chill: A Disruptive Event Made Worse by Infrastructure Interdependencies[1]**

The "Big Chill" of 2011 illustrates the complicated relationship between natural gas and electric power, which had compounding effects during a period of extreme weather.

During the first week of February 2011, the U.S. Southwest was hit by an arctic cold front that was unusually severe in terms of its low temperatures, gusting winds, geographic extent, and duration. From January 31 to February 4, temperatures in Texas, New Mexico, and Arizona were the coldest experienced within the region since 1971. Dubbed the "Big Chill" in the media, it overwhelmed the routine preparations for cold weather that had been put in place by electric generators and natural gas utilities located in those states.

Within the Electric Reliability Council of Texas (ERCOT) Interconnection, starting in the early morning hours of February 2, the cold temperatures and wind chill caused a significant number of outages at generating plants, with approximately one-third of the total ERCOT generating fleet unavailable at the lowest point of the event. With electricity demand soaring because of the cold weather, ERCOT and some utilities in New Mexico instituted rolling blackouts to prevent collapse of their electric systems. For the Southwest as a whole, 67 percent of electric generator failures (by megawatt-hour) were due directly to weather-related causes, including frozen sensing lines, frozen equipment, frozen water lines, frozen valves, blade icing, and low-temperature cutoff limits on equipment.

Gas producers and pipelines were also affected in Texas, New Mexico, and Arizona. Natural gas production was diminished due to freeze-offs and the inability to reach gas wells (due to icy roads) to remove produced water and thereby keep them in operation. When rolling electricity blackouts hit gas producers and gas pipelines, it had the effect of causing further losses to natural gas supply. The ERCOT blackouts or customer curtailments caused or contributed to 29 percent of natural gas production outages in the Permian Basin and 27 percent of the production outages in the Fort Worth Basin, principally as a result of shutting down electric pumping units or compressors on gathering lines. As a result of all these factors, natural gas deliveries were affected throughout Texas and New Mexico. More than 30,000 customers experienced natural gas outages at some point during this period.

The majority of the problems experienced by the many generators that tripped, had their power output reduced, or failed to start during the event were attributable, either directly or indirectly, to the cold weather itself. However, at least another 12 percent of these problems were attributed afterward to the interdependencies between gas and electricity infrastructures (such as lost electricity generation due to natural gas curtailments to gas-fired generators and difficulties in fuel switching).

[1] Federal Energy Regulatory Commission and North American Electric Reliability Corporation. "Report on Outages and Curtailments During the Southwest Cold Weather Event of February 1-5, 2011: Causes and Recommendations." August 2011. http://www.ferc.gov/legal/staff-reports/08-16-11-report.pdf. Accessed February 2, 2015.

We made energy infrastructure an early priority in my tenure as Secretary at DOE with the drafting and publication of the first installment of the Quadrennial Energy Review, or QER, which was focused on energy infrastructures, including shared infrastructures. This installment made 63 recommendations for building a smarter, cleaner electric grid; promoting workforce training and development; reducing emissions from natural gas systems; supporting the re-investment into our critical waterborne transport systems; and enabling improved siting and permitting issues that are critical steps for deploying innovative systems to the market. By the end of my tenure, 29 of QER1.1's 63 recommendations had been implemented fully, with 21 more underway. It is worth noting that that the first installment of the QER included a section specifically focused on the 2011 cold snap in Texas and New Mexico, emphasizing the growing interdependencies of the electricity and natural gas infrastructures, borne out by events in Texas 10 years later (see Text Box 1).

The second installment of the QER focused specifically on the grid: "Transforming the Nation's Electricity System". This installment evaluated the centrality of the electric grid to the nation's economic health, national and energy security, and the social lives of our citizens. It recommended flexible financing for developing a clean, modernized grid; ensuring the electric grid is prepared for growing risks of anthropogenic climate change and cyber-attacks; building capacity at the federal, state, and local levels to support the grid's regulatory and policy requirements; and maximizing consumer equity and economic value of the system.

I am pleased to see that some of the provisions of the LIFT America Act align with QER recommendations, including the establishment of a Strategic Transformer Reserve and the natural gas infrastructure grant program. A summary of recommendations from both QER installments has been entered into the record as attachments to this testimony. The non-profit Energy Futures Initiative (EFI) that I founded with two colleagues from DOE has continued work on some of the QER recommendations, in particular the development and release of the annual U.S. Energy & Employment Report.

Only four years have passed since we issued the last installment of the QER in January 2017 but the urgency of upgrading our energy infrastructure in service of a deeply decarbonized economy has become even clearer. The advances in climate science and the realities of extreme weather call for action, as advocated by this committee with the LIFT America Act and other initiatives, such as the CLEAN Future Act introduced earlier this month.

In looking ahead to infrastructure needs, it is useful to focus on a number of technologies that will almost certainly play major roles in a deeply decarbonized economy:

- ***Electricity and the grid:*** The electric sector is leading the way on decarbonization and will continue in that role. A reliable and resilient grid will also continue to be the central infrastructure on which other infrastructures depend. How that grid is configured will have to be matched to the mix of critical generation and storage technologies: variable renewables wind and solar, batteries and long duration storage, advanced nuclear technologies (fission and fusion), fossil power plants with carbon capture, utilization, and sequestration (CCUS).
- ***Electrification of other economic sectors, especially transportation:*** Momentum has continued to build for electric vehicles (EV), a fact that is underscored by recent announcements from major automakers. An elaborate continental scale charging infrastructure will be needed. In turn, vehicles connected to the grid might make a major contribution to grid services.
- ***Large scale carbon management:*** CCUS at gigaton scale from power plants and industrial facilities will require a major $CO_2$ pipeline infrastructure and significant hubs for geological $CO_2$ storage. In addition, reaching net zero emissions – and eventually net negative emissions – throughout the economy will require carbon dioxide removal (CDR) from the atmosphere and upper ocean layers. Many CDR pathways – direct air capture (DAC)biomass energy with CCS (BECCS), and in-situ mineralization – will depend on large scale carbon management infrastructures.
- ***"Fuels" to complement clean electricity:*** It is very unlikely that efficiently decarbonizing the economy can be fully achieved through electrification only. A low-carbon fuel will be needed, and the general view today is that hydrogen is the most likely candidate. This will require yet another major infrastructure for the use of hydrogen – a highly flexible fuel that could assume the critical role currently played by natural gas -- in multiple sectors over the next decades. Blue hydrogen (i.e., made from natural gas with the emitted CO2 undergoing CCUS) will also utilize the large-scale carbon management infrastructure in addition to the hydrogen infrastructure needed for green hydrogen (i.e., made by electrolysis of water).

While only a partial list, this set of new infrastructure needs has a clear connection to decarbonization while maintaining the reliability and resilience of the grid and supporting the significant economic activity and essential services that are currently associated with conventional fuel use. These critical needs cannot be met without a major commitment to infrastructure, and the LIFT America act sets us on that pathway.

## The Central Role of Electricity

First and foremost, the recent Texas experience underscores the critical and central role electricity plays in our lives, the economy, and the nation's security. No systems in Texas were fully operational without electricity, the "uber" infrastructure.

This experience, the rolling blackouts in California due to the Western heat wave last August and numerous other weather-driven catastrophes, drive home an essential consideration going forward: energy infrastructures, especially the grid, are very exposed to the *impacts of climate change*. As we increase our focus on the electrification of several sectors and subsectors—a key decarbonization strategy—the Texas experience and this exposure reminds us that the reliability and resilience of the grid is a critical consideration and need. Research, development, and demonstration of grid resilience technologies will be critically important to preserving reliability, an essential role of the federal government.

It also drives home another key point: climate change means that the weather patterns of the past are not adequate to inform those of the future. This changed risk profile affects infrastructure from design, to investment, to buildout, to insuring the system. As we increase electrification of key sectors, we must thoughtfully approach these requirements for, and risks to, a modernized electric grid. In addition, increased electrification of other parts of the economy necessitates a substantial buildout of the grid system, from transmission lines to substations and transformers, to distribution systems and EV charging stations, all the way to heat pumps for homes.

Another critical part of the future grid will be a set of technologies that supply large scale, long duration storage to support wind and solar generation. As seen in Figure 1, in 2017, California had 90 days with little to no wind, sometimes 10-11 days in a row. Deployed grid-scale battery storage has a duration of around four hours.

**Figure 1. California Wind Generation for Each Day of 2017 Compared to 2019 Storage Capacity**

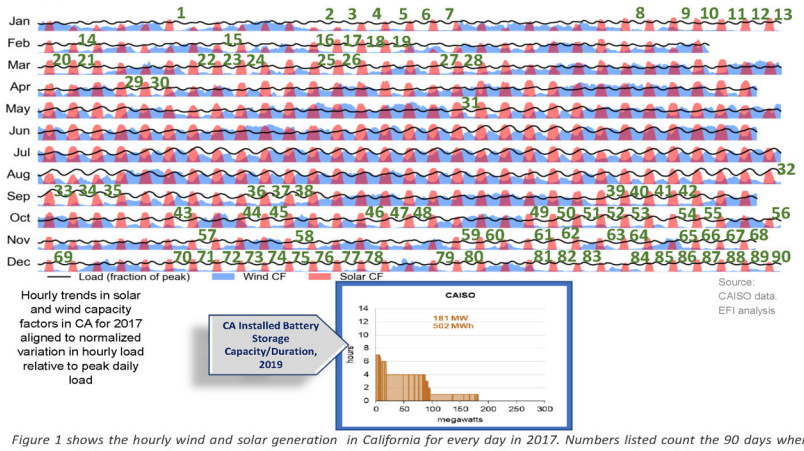



*Figure 1 shows the hourly wind and solar generation in California for every day in 2017. Numbers listed count the 90 days where there was little to no wind generation in the state. The inset shows the installed battery storage capacity and duration in California, which is currently insufficient to provide long term storage during multi-day periods of low wind generation.*

Even with continued innovation, batteries will likely be used for intraday storage needs. We need innovation in long duration storage—days, weeks, and seasonal—complemented by different generation technologies (such as advanced nuclear and CCS) and market structures that support clean firm power as well.

**Modernizing the Existing Electricity Grid Infrastructure**. As noted, the electric grid is the "uber infrastructure" -- the backbone of our economy and social interactions, central to meeting health and safety needs, and critical to our national security. It touches everything and will be a critical enabler of, and contributor to, decarbonization. Due to its outsized importance, combined with emerging trends, electric grid modernization must meet multiple objectives: providing clean, reliable service to growing demand; promoting social equity and inclusion; ensuring resilient performance in the face of a changing climate and increasing cyber threats; integrating distributed sources of clean electricity; and supporting broad connectivity throughout the system to enable smarter cities and communities.

Managing an electric grid that is the size and complexity of the U.S. system is a major challenge. There are already 642,000 miles of high voltage transmission lines and 6.3 million miles of distribution lines in the U.S.[1] As the US transitions to a clean energy future, the electric grid will require many billions of dollars of investment over the coming years.

Connecting renewable energy from remote areas to urban centers, for example, will require a significant transmission system buildout. Expanding the role of federal power marketing authorities in building out new transmission could help add long-distance bulk transmission capacity. EFI and Energy and Environmental Economics (E3) completed a study last year on decarbonizing New England's economy and electric grid. The study found that by mid-century, electricity demand would grow by 60-90% from current levels. This would require massive investments in the associated buildout of the grid infrastructure, especially to access more Canadian hydropower and to accommodate a massive new offshore wind development.

There are several actions that could facilitate the deployment of new transmission that will be necessary for deep decarbonization. Permitting could be streamlined in a number of ways in a broad stakeholder process: a pre-approval optional process for state and local authorities; centralizing certain kinds of transmission permitting in a single authority (such as FERC); harnessing existing rights of way for rail, pipelines, interstate highways, and other infrastructure so as to minimize eminent domain requirements and public opposition; tailoring permitting procedures for new kinds of infrastructure like CO2 transport/DAC; empowering decisionmakers to resolve intragovernmental dispute; conducting multiagency reviews in parallel rather than sequentially; and ensuring Tribal sovereignty/input.

Modernizing the grid will also depend on updating today's electricity market design. The current wholesale electricity market design is increasingly challenged to reconcile the integration of intermittent generation sources with the need to ensure reliability by maintaining clean firm power generation. Moving to a net zero electricity generation regime will further amplify these challenges. Rectifying this problem could involve redesigning the electricity market to better accommodate existing subnational and proposed national decarbonization policy initiatives, lower barriers to new technology, encourage demand-side participation, value more attributes of resources, and better meet reliability needs. Congress could initiate a review of federal policy on wholesale market design.

**Electric Vehicle Infrastructure**. Over a quarter of US emissions come from the transportation sector, the nation's largest emitting sector; on-road vehicles comprise 23% of US emissions. Moving to a mid-century net-zero economy will require electrification of nearly all light-duty vehicles, as well as significant percentages of other transportation subsectors.

Foreign and domestic manufacturers have announced substantial investments in electric vehicles, with General Motors, for example, committing to discontinuing new internal combustion models by 2035. Infrastructure options and associated policy support will likely have to accommodate battery electric vehicles and plug-in hybrids, hydrogen fuel cell vehicles and vehicles that run on biofuels. Emissions-free liquid fuels likely will

[1] Quadrennial Energy Review, Department of Energy, 2015.

garner some market share, and policies to improve fuel economy of new models and encourage mode-switching will continue to be important.

On a global scale, the IEA Sustainable Development Scenario estimates an increase in EVs from five million in 2019 to about 140 million by 2030. This would require a rapid scaleup from the current global battery manufacturing capacity of 193 GWh (41 of which are in the U.S.) by an order of magnitude. Likewise, public chargers would need to scale by orders of magnitude to numbers in the millions by 2030, compared to around 100,000 today. It would also require vastly more supply of cobalt and lithium, supplies of which currently depend on imports. There is also global competition for these critical supplies of mineral and metals, as well as a concentration in China of the processing needed, for lithium-ion batteries.

To support this enormous demand growth – essential for meeting climate imperatives -- EV infrastructure must be scaled up rapidly in the next three to five years. This buildout includes supply infrastructure, private and public chargers, as well as the electricity system and building upgrades needed to accommodate them. Additional infrastructure will be needed to support vehicle-to-grid integration and managed charging, which can mitigate the potential impacts of vehicle charging on electricity demand.

Federal policy will be necessary to accelerate the development and deployment all three types of EV infrastructure at a pace sufficient to meet deep decarbonization targets. Supply infrastructure could be supported by a combination of incentives, such as rebates and grant programs; or mandates, such as inclusion in state energy plans or building codes. Federal programs for zero-emissions vehicles have been designed around biofuels, and some of these programs can be reoriented to reflect the growing dominance of EVs in the energy transition. As the Federal government incentivizes and supports buildout of an EV charging network, a core design element must include serving areas where individual home charging stations are not possible (e.g., urban areas with predominantly on-street parking).

It is also crucial to ensure that EV infrastructure is deployed equitably. In the past, vehicle electrification incentives have benefited people at higher incomes, due to EV's higher upfront costs and the requirements of at-home charging; new policies can shift this dynamic as EVs become cheaper and more widespread.

Battery supply is also a critical need. Federal incentives like the DOE Advanced Technology Vehicles Manufacturing Loan Program have already supported the growth of domestic battery manufacturing, funding battery factories for Tesla and Nissan. More incentives will be important, as well as RD&D investment to reduce battery cost and improve performance. IP protection is also essential to create the necessary environment for innovation and investment.

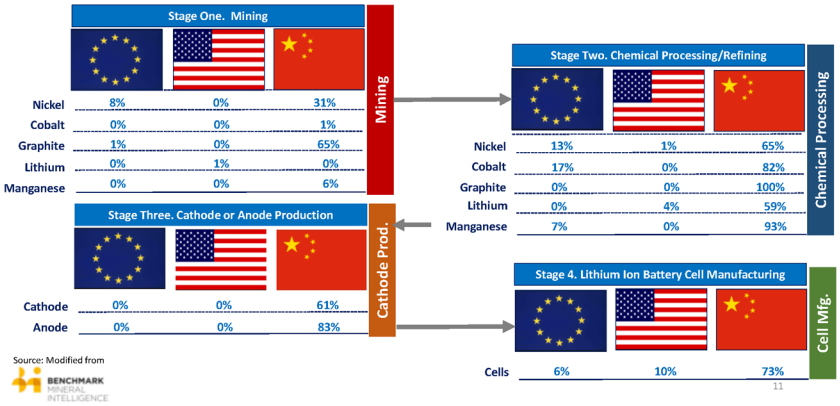
Battery supply considerations must also accommodate supply chains for the metals and minerals necessary to manufacture batteries, such as lithium and cobalt; domestic net-zero mining, and the buildout of the infrastructure needed for battery manufacturing itself, will become essential (a more detailed discussion of these issues is found on page 10). This will be an area of increasing global competition, and support for domestic supply chains and protection of the intellectual property of innovators will be essential.

The metals and minerals supply chain requires development of a framework for sustainable domestic mining, as well as RD&D on new sources for these materials. Innovation can also help develop substitutes, as well as batteries with lesser critical material needs. Policies that establish producer responsibility for used batteries can encourage the development of new technologies, chemistries, and systems. Innovation could enable cost reduction, reduce dependence on imports of critical metals and minerals, and open the door to the development of new battery technologies.

EFI is undertaking research on supply chain issues, with a focus on expanding domestic supplies of metals and minerals. New domestic sources of lithium are already being explored, and innovation could develop alternatives and/or additional supply, such as geothermal brines in places like California's Salton Sea. More domestic mining would allow for a bigger push to make battery supply chains more environmentally sustainable, as well as provide a bulwark against the frequent price fluctuations of these commodities. Innovation could also make improvements further down the supply chain, by reducing the quantities of critical

materials required and increasing recycling options and opportunities. Figure 2 shows the steps in EV battery production for the EU, US and China, and the relative shares of each country/region in supplying those steps.

**Figure 2. Select Processes for Key Metals and Minerals Need for EV Battery Production: EU, US and China Shares, 2019**




**Offshore Wind: Renewable Electricity with Major Infrastructure and Supply Chain Needs.** Offshore wind (OSW) is poised to significantly contribute to decarbonizing the power sector by 2035, boosting the reliability and resiliency of a modernized national electric grid infrastructure. It provides a good example of the importance of infrastructure planning to enable a critical low-carbon pathway and create lots of good jobs.

Offshore wind projects face significant barriers to adoption, however, including: 1) long and uncertain permitting processes that increase costs and threaten access to tax incentives for project investment; 2) high costs and insufficient financial incentives to build transmission lines to connect offshore wind to shore; and 3) potential opposition from local stakeholders including property owners who have raised sight and noise concerns, and fishermen who are concerned about impacts on their businesses. Reducing these barriers can unlock tremendous investment in clean energy and promoting domestic supply chains will ensure the investment and job creation is made in America. In developing offshore wind infrastructure, the US has an opportunity to support high-paying domestic jobs in the steel, manufacturing, and utility sectors.

It is critical that any offshore wind policy -- perhaps with a phase-in period for domestic content -- be designed to encourage a build out our domestic supply chain capabilities to support this new industry. Current commitments for Atlantic Coast wind development total 32GW—about three percent of total current U.S. capacity. This capacity could require deployment of about 4,000 turbines, creating tens of thousands of new jobs. About 20 GW of projects are in various stages of planning and development, implying up to $68 billion in capital investments, not including necessary investments in supporting infrastructure, shipping and port capacity, or workforce development.[2]

[2] Special Initiative on Offshore Wind, "Supply Chain Contracting Forecast for U.S. Offshore Wind Power," March 2019.

New federal policy for transmission system build-out could include expanding DOE's Loan Program funding to include offshore wind transmission network infrastructure and associated upgrades of coastal grid infrastructure, including public-private partnerships. Congress could also expand the investment tax credit to include transmission components from offshore collector platforms to onshore substation points of interconnection.

Other policies to encourage development of domestic supply chains could include reinstating the 48C Advanced Energy Manufacturing Tax Credit program to help spur development of a robust U.S. manufacturing capacity for American-made offshore wind turbines, nacelles, blades, subsea cables, and other equipment. In addition to domestic supply of steel and component parts, policies to encourage domestic supply base of critical metals and minerals for offshore wind turbines and structures could both preserve and increase jobs across the supply chain. A reinstated 48C tax credit would also benefit many other clean energy technologies.

Building out seaport facilities and related marine infrastructure is an important part of OSW implementation and the domestic supply chain. There are several financial incentives pathways that could incentivize the buildout of port facilities. One pathway is to expand the Maritime Administration's Port Infrastructure Development Grants Program, Small Shipyards Grant Program, and America's Marine Highway Program. A second pathway would be to increase funding for BUILD grants to upgrade U.S. ports for offshore wind installations, including heavy-duty cranes, turbine assembly areas, lay-down yards, deep draft berth and multi-modal transport connections. Decarbonization of port infrastructure operations, through electrification, or use of hydrogen or other net zero carbon fuels, should be integral to infrastructure modernization and should be strongly incentivized.

Building out the shipping fleet needed to construct, transport, and maintain offshore wind turbines is another opportunity for creating good paying American jobs. The government could provide financial incentives, grants, and loan guarantees for U.S. shipbuilders' construction of vessels that will install and provide maintenance to OSW farms, transmission platforms, and seabed cables. These incentives may require some short-term Jones Act waivers as the domestic fleet is built.

EFI is working within the Labor Energy Partnership (LEP) with the AFL-CIO to further delineate key issues, develop an analytical agenda and pursue in-depth study of domestic supply chain. This in-depth study will seek to understand how the domestic supply chain for offshore wind can create robust and competitive global supply chains for this new industry. The analysis will map out the network of existing domestic companies, potential technology clusters, and timelines, and will catalogue incentives that are needed to ensure that public investments in offshore wind result in maximizing domestic, high-quality job creation.

### Cross-Sectoral Technology Options with Infrastructure Needs

Net zero targets around the world—including what might be included in the new US NDC—are placing additional policy, innovation, infrastructure, and competitive pressures on all major economic sectors – transportation, electricity, buildings, industry, and agriculture – to deeply decarbonize.

In this regard, the US industrial sector is one of the most difficult sectors to decarbonize. The industrial sector and many subsectors, e.g., refining, chemicals, steel, cement, iron, and ammonia production, are essential to the US economy, its export markets, and jobs. The US iron and steel industry for example, while a major emitter, supported almost two million US jobs and $523 billion in economic output in 2019. The industrial sector is also a major consumer and producer of hydrogen and in many instances relies on both natural gas and oil as feedstocks or fuels for a range of processes.

Decarbonization options for the industrial sector include some electrification and increased efficiency, as well as carbon capture and sequestration and increased use of hydrogen—a clean energy carrier that can support the decarbonization of many critical sectors. Policy support for the buildout of the associated infrastructures that could be compatible, co-located or re-purposed, will reduce their emissions while helping to enable the ongoing economic benefits of these industries and ensuring they meet new requirements of export markets that may include the calculation of embedded emissions.

This buildout would also support the decarbonization of other sectors – the power sector, for example, could use both CCUS infrastructure as well as hydrogen -- with an end state that could include a green hydrogen future, supported by natural gas and blue hydrogen with CCUS. Policy incentives, infrastructure investment, and market formation regulatory support will aid in this buildout that could ultimately support zero emissions industry, transportation, and power generation. Key cross-sectoral technologies and infrastructures include natural gas, hydrogen and CCUS, discussed in detail in this section of my testimony.

**Improving and Transitioning Existing Natural Gas Infrastructure.** Natural gas has become a major part of the U.S.—and global—energy mix over the last three decades, displacing higher emitting fuels and lowering greenhouse gas emissions. As many regions of the country begin to shift their policy targets toward net zero emissions, the emissions from natural gas, including methane emissions, must be reduced, or eliminated. I understand there are major proponents of "keeping it in the ground". Responsible actions, however, acknowledge that natural gas currently provides the fuel needed for clean firm power (recall the 90 days with no wind in California), and is an essential fuel for industry, a major energy consuming sector that is difficult to decarbonize.

There are significant opportunities to leverage the natural gas system's infrastructure to accelerate economywide decarbonization. Natural gas fired generation provides the electric grid with firm, dispatchable power. It also enables a lower-cost transition. EFI's study of New England showed that the cost of reaching a deeply decarbonized electric grid by midcentury was cut in half when natural gas with carbon capture and storage is included as a technology pathway. In many projected futures, a renewables-heavy electric grid would dispatch power from natural gas units only to maintain reliability and resilience.

EFI is currently assessing the global future of natural gas in a deeply decarbonized world, including the critical issues of supporting economic development. Initial findings from workshops held with think tanks in key world regions suggest that all regions have a significant interest in reducing emissions, and there are competing priorities that must also be considered. There is an emerging consensus that there will be a role for natural gas in a decarbonized global economy, specifically as an enabler of—and complement to—intermittent renewables for power generation, as a near-term "transition fuel" for fuel switching (especially away from coal and oil in power generation), as a feedstock in industry and for sectors that require high temperature process heat, and as a backup fuel in multiple end-use sectors.

For the natural gas system to be leveraged as part of the clean energy transition, however, its emissions must be reduced to meet climate policy targets. While there is a significant amount of debate around the current emissions from the gas sector, it is critical that the system's owners and operators monitor, detect, and eliminate methane leaks and other direct and indirect emissions associated with its operations. New standards to regulate methane leakage are possible within existing authorities. Also, the Interior Department could update its regulations for methane emissions from infrastructures on federal lands; EPA can revise its rules on methane under the Clean Air Act; and FERC could consider the establishment of new end-to-end standards for methane leakage for all gas ultimately entering interstate commerce or seeking LNG export authorization. EFI is evaluating opportunities to create an improved data and analysis framework for better modeling methane leakage from the natural gas infrastructure, as a foundation for future policy and regulations to manage its emissions.

Natural gas, as noted, is also an essential fuel for the U.S. industrial sector, that currently has few options for mitigating CO2 emissions. Also, as noted, key industries – chemicals, plastics, iron, and steel—use natural gas as a fuel for process heat, and to produce the hydrogen used in a range of other industrial processes. These industries represent a major portion of U.S. GDP and employ hundreds of thousands of workers, across many regions of the country. Many of these industries will also be essential making the cement and steel needed for the grid, roads carrying EVs, and highly efficient buildings. Greatly reducing methane emissions along the supply chain deserves full commitment from industry.

Congress could also take a carrot-and-stick approach, pairing this regulation with financial support to offset rate impacts of gas pipeline improvements, as recommended in the QER. This policy could also specifically target improvements in communities that have a disproportionate pollution burden through carve-outs or

other measures. In tandem with these programs, the federal government could also work to improve methodologies for measuring and estimating fugitive methane emissions.

Federal policy could also help propel innovation in natural gas infrastructure. Incentives for improvements could be strengthened if the improvements are particularly novel or effective at reducing emissions. Federal funding for RD&D could also help transform natural gas infrastructure for the net-zero world, including regional demonstration projects for hydrogen/natural gas blending or incentives for biogas.

U.S. LNG production and exports also have significant infrastructure needs, including ports and pipelines. Destinations for U.S. LNG include Brazil, Japan, South Korea, Mexico, India, the EU, and several other countries and regions. In many cases, this has supported climate change mitigation by gas substitution for coal. Analysis by the International Energy Agency concluded that coal to gas fuel switching reduced global emissions from the power sector by four percent. In China reduced emissions from its power sector by eight percent in 2018 alone and in the US by 14% that year.

**Hydrogen: Both a Transition Option and an End State**. Hydrogen is a clean energy carrier with multiple applications across every sector of the economy. Clean hydrogen could play an essential role in a low carbon economy as a zero-carbon "fuel" and was identified as one of ten technologies with significant breakthrough potential in EFI's 2019 report, "*Advancing the Landscape of Clean Energy Innovation.*" EFI analysis in 2019 also concluded that hydrogen was one of four cross-cutting clean energy pathways that could help California meet its mid-century net zero targets.

There is significant interest among investors, utilities, oil and gas companies, and heavy industry to be part of the hydrogen solution. Opportunities for clean hydrogen end uses include industrial processes, heavy transportation, and power generation. Hydrogen from natural gas steam methane reforming (SMR) processes are already mature and meet almost all current domestic hydrogen demand. Producing "blue hydrogen" by capturing the carbon emitted via this hydrogen production approach is an off-the-shelf clean hydrogen solution. Using clean electricity to produce "green hydrogen" is also commercially available but requires further innovation to reduce costs.

The infrastructures needed for hydrogen market formation tend to be highly regional. Potential large-scale consumers, such steel, and power generation, tend to be in close proximity, and are already supported by the pipelines, power lines, roads, and other infrastructures needed for the clean energy transition. Finding similar synergies with other infrastructure needs for achieving deep decarbonization, including carbon capture and storage from a range of facilities, could lower the overall development costs of a hydrogen-fueled economy at the same time they provide pathways for a net zero future. These potential "hubs" could be formed in regions where various users of hydrogen across industrial, transport and energy markets are co-located and could benefit from shared infrastructure.

As with carbon capture and sequestration, large hydrogen users may have the business expertise and capital availability to support an end-to-end hydrogen supply chain for their own uses. For clean hydrogen to scale, however, new infrastructure investments will likely be required to enable market hubs where several producers and consumers are co-located and benefit from economies of scale.

Figure 3 offers a snapshot of where joint CCUS-hydrogen market hubs might form based on existing industrial clusters that are major GHG emitters, produce or consume hydrogen, have substantial fossil-generated power generation, and potential sequestration sites for captured $CO_2$. Within one hub, there could be a mix of blue hydrogen and CCUS for different categories of industrial plants.

**Figure 3. Potential for Co-location of Hydrogen and CCUS Hubs**

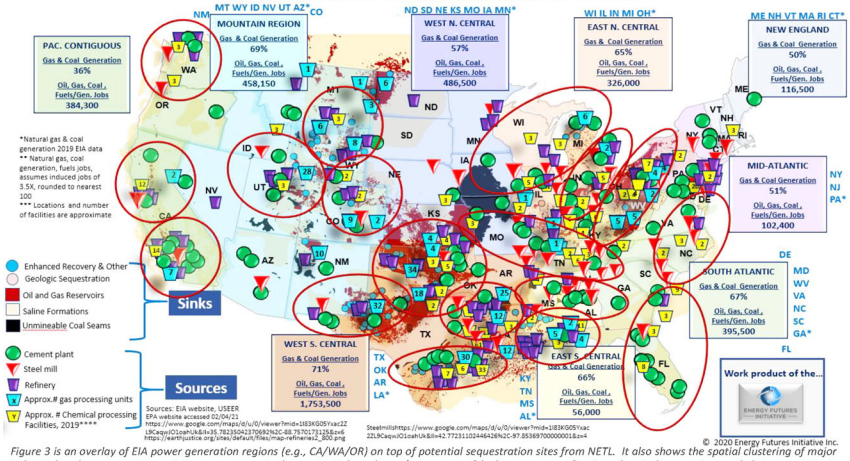



*Figure 3 is an overlay of EIA power generation regions (e.g., CA/WA/OR) on top of potential sequestration sites from NETL. It also shows the spatial clustering of major industrial and power sector emissions sources, actual or potential producers/consumers of hydrogen, e.g., refineries, chemical processing, and their proximity to geological formations that are suitable for permanent geologic storage of captured $CO_2$. The clusters represent opportunities for potential CCUS/hydrogen hubs that could share a range of infrastructures, indicated by the larger red circles.*

The formation of hydrogen hubs may develop along a similar path to natural gas distribution systems, requiring policy enablers, regulatory frameworks, and new business models. EFI is investigating the policies needed for hydrogen market formation in the United States, actively working with major stakeholders to profile current investments in clean hydrogen across the emerging hydrogen value chain: production, transport, and end use. This will help EFI to develop regional case studies to evaluate the specific opportunities and challenges of building out hydrogen infrastructure and markets. Federal and state governments should work together to incentivize early-mover hydrogen-$CO_2$ hubs, perhaps through approved multi-state regional compacts.

Federal financial incentives will be a key part of developing hydrogen infrastructure. These could include tax incentives for production, installation of supply infrastructure, purchase of hydrogen-fueled vehicles, or use in industrial and commercial contexts. Infrastructure-specific incentives will be key to solving the chicken-and-egg problem of hydrogen supply. Another form of incentive could be use of public procurement power, such as purchase targets for fuel-cell vehicles. A carbon border adjustment for energy-intensive goods could also encourage industrial producers to be early hydrogen adopters.

Federally funded innovation will also be key to developing a hydrogen economy. One possible path forward toward hydrogen hubs is the establishment of a federally assisted demonstration program, which would create two to three hubs that could be used as examples for the rest of the country. Expanded RD&D could reduce cost of blue or green hydrogen production, and further develop new configurations like nuclear-powered production. Innovation could also be important to developing alternative forms of hydrogen carriers.

**CO2 Transportation and Storage**. Carbon capture utilization and storage (CCUS) will be an essential element in any portfolio of actions for meeting a mid-century net zero goal. As one indicator of scale – the EFI study of the California decarbonization policies and plans found that CCUS could contribute to a reduction of around 60

MMTCO2, representing nearly 30% of the State's 2030 emissions reduction target. Scaling CCS projects nationwide will require significant quantities of CO2 that must be captured and transported for geologic storage or other disposition. CO2 transport and storage also will be required to support carbon removal technologies including biomass with carbon capture and storage (BECCS), Direct Air Capture (DAC), and in-situ carbon mineralization.

Very large carbon management projects, such as at some power generation facilities or large industrial emitters, may deploy CCUS as a single, wholly owned and operated project. Many other CCUS and direct carbon capture projects, however, will need to rely upon the economies of a large-scale carbon management hub, where CO2 transport and storage is provided by a 3rd party deployment of a spoke-and-hub architecture. Congressional action can provide needed stimulus for the formation of such regional CO2 hub infrastructures.

Building a CO2 pipeline infrastructure raises the challenges of obtaining rights of way and the complexity of permitting. The EFI analysis of CCUS deployment opportunities in California showed that project permitting is one of the most significant impediments to progress for new CCS project developers. CCS projects involve permitting for at least two processes (capture and storage) and each process may include multiple—and up to a dozen—state and federal agencies that may not be familiar with CCS permitting processes. $CO_2$ transportation needs add to the complexity when projects have widely separated source and sink. Congressional action to encourage repurposing of existing rights of way to allow for CO2 pipelines to co-locate with other infrastructures would be beneficial. Policy direction to improve coordination of permitting, such as the provisions of the proposed USEIT Act, also would be very beneficial. Finally, additional financing incentives, such as an expanded application of the DOE Title XVII loan guarantee program or new financial incentives such as those in the SCALE Act, could accelerate the pace of buildout of $CO_2$ pipeline infrastructure.

In addition to pipeline infrastructure, the other key element of $CO_2$ infrastructure is the buildout of geologic storage hubs. The DOE Carbon Storage Assurance Facility Enterprise (CarbonSAFE) program has supported the characterization studies needed to assess the feasibility of storage hub locations. This work could be accelerated with additional funding and expanded in scope to enable the build out of several of the CarbonSAFE sites into regional storage hubs. The September 2019 EFI Report, Clearing the Air, discussed in more detail the opportunity to expand and accelerate the storage hub concept.

Finally, creating a large-scale CO2 management infrastructure will require the development of new business models and regulatory frameworks. The creation of 3rd party carbon management entities – perhaps a CO2 utility model - provides a substantial new business opportunity for firms with expertise and experience in managing fossil fuel production and processing; the 3rd party could be organized as a regulated utility due to the non-competitive nature of shared transportation and storage infrastructure. New regulatory structures, with an emphasis on encouraging deployment on a regional scale, also will be needed. Management of liability, particularly in cases where the entity managing the CO2 storage is different from the entity that generated the CO2, will be critical. The monitoring, reporting and verification (MRV) requirements of the current EPA Class VI permitting program may need to be supplemented with some form of an insurance pool to address liability for CO2 leakage from third party sequestration sites that are managing CO2 from multiple sources. An insurance pool could more appropriately balance risks between generators of CO2 and owner/operators of CO2 storage sites, lowering an impediment to project finance and development.

### Other Cross-cutting Needs for Expediting Clean Energy Infrastructure Buildout

There are other issues, policies and potential options that should be considered in the context of infrastructure incentives and policies to aid in the clean energy transition. These include protection of global supply chains and incentives for building domestic capacity; the growing interdependencies of key infrastructures; broadband access; the generic need for expedited infrastructure siting; and cyber-security.

**Protecting Global Supply Chains, Building Domestic Options.** Increased electrification, new clean energy technologies, LNG exports to allies, and COVID have raised issues about the security of global supply chains and the need to focus on creating, building, and reinvigorating domestic options. As noted, electrification and

the buildout of transmission lines, and variable renewable generation technologies, will mean dramatic increases in demand for steel, EV battery manufacturing, the mining, processing, and refining of key metals and minerals including lithium, cobalt, manganese, and nickel, and cathode and anode production. And this demand growth is not occurring in a vacuum. Net zero targets are increasing demand—and competition—for steel, EVs, batteries, and other key materials and technologies around the world.

The need to address these issues was underscored by President Biden's Executive Order 14017, America's Supply Chains, which notes that "More resilient supply chains are secure and diverse—facilitating greater domestic production, a range of supply, built-in redundancies, adequate stockpiles, safe and secure digital networks, and a world-class American manufacturing base and workforce. Moreover, close cooperation on resilient supply chains with allies and partners who share our values will foster collective economic and national security and strengthen the capacity to respond to international disasters and emergencies."

Figure 3 underscores some of the critical issues that drive the need for such an order and highlights key areas of focus for building up domestic supply chain infrastructures. From an energy perspective, the EO focuses on two key areas: batteries and industrial supply chain needs. Creating domestic options for both batteries and critical industry needs should be considered essential components of a clean energy future.

Protecting global supply chains, growing domestic industries and options, and investing in innovation, are all critical to providing the energy and associated infrastructures for a clean energy future. This should, in fact, inform and broaden the definition of both energy infrastructure and energy security to help ensure policymakers are providing adequate direction and incentives to support the supply chains and industries needed for a clean energy future

Policies that could enhance US capacity in these areas include:

- protection of global supply chains for minerals/metals needed for wind, solar and batteries;
- support for new domestic, environmentally responsible mining activities for key minerals/metals, including associated infrastructure;
- an increase in the capacities, capabilities, and associated infrastructures needed for key mineral chemical processing/refining and battery manufacturing; and
- the promotion of humane mining conditions around the world.

**Infrastructure Interdependencies.** The Texas experience also highlights the growing interdependencies of critical infrastructures and points to a key need going forward. In the case of the Texas deep freeze, it was the electricity, gas, and water infrastructures. These three infrastructures—and other critical infrastructures—do not sit neatly together in law, regulation, oversight and, relevant to today's discussion, within either committee or federal agency jurisdictions. This needs significant analysis to identify changes in policy and program structures that might be needed to accommodate the new realities of clean energy systems and the interdependencies of critical infrastructures.

**Broadband Access.** Energy infrastructures are also increasingly dependent on digital technologies, making broadband access a critical part of modernizing those infrastructures. In fact, the COVID-19 pandemic has demonstrated just how dependent we are on internet access in all facets of modern life. The increasing IT connectivity of energy systems could also help accelerate the low-carbon transition, facilitating digital infrastructures that allow for more efficient energy use and integration of new kinds of resources. Increased public investment can mitigate existing inequities in broadband access and close the gap to universal deployment. There are also possible synergies between broadband and energy infrastructure: pursuing the physical improvements and expansions required for each system in parallel can create opportunities for cost savings and more efficient permitting.

**Infrastructure Siting Challenges.** In addition, the urgency of climate change and the need for a range of new infrastructures begs siting questions and the speed at which new infrastructure can be built. The list of delays in siting key energy infrastructures is long and includes the Northern Pass Project, Cape Wind, the Winder

Catcher project, Sun Zia and the Clean Line Energy project that we worked on at DOE when I was Secretary.[3] There are existing rights of way, e.g., for railroads, interstate highways, gas and oil pipelines, and existing electricity transmission that might be re-purposed to help expedite the siting of new clean energy infrastructures. It is possible that such re-purposing could also be monetized, aiding in reducing financial losses to industries that have relied on revenues from conventional energy. Coal transport, for example, has been a significant source of revenue for freight rail, but coal demand has declined significantly over the last several years; with federal support and guidance, railroad rights of ways might be valuable for more rapidly siting new infrastructures needed for a clean energy future. An examination of existing authorities and the development of new authorities to support the re-purposing or multi-purposing of existing rights of way could help accelerate the transition to a clean energy future.

**Cyber-Security**. Ensuring cybersecurity must be a fundamental consideration when modernizing and expanding U.S. energy infrastructures. The modern energy system—including the electric grid, natural gas systems, on-road and air transport, and manufacturing—will become increasingly dependent upon cyber-physical systems. As the energy system becomes smarter through the integration of information and operational technologies, the risks posed by cyber-attacks will increase. There are, however, also opportunities to engineer cybersecurity into the future energy infrastructure in a way that supports decarbonization, operational resilience, and security. This will include developing intrusion detection systems into critical components, expanding our capability to monitor and track the supply chains for critical components, embedding cybersecurity into training across the entire workforce, building on our strong information sharing programs between the government and private sector and among industry itself. The recently revealed SolarWinds attack shows how cybersecurity must be applied along the entire supply chain for infrastructures. These and other measures should be integrated into how we build energy infrastructure in the United States.

## Transitioning Conventional Energy Jobs to the Clean Energy Jobs of the Future

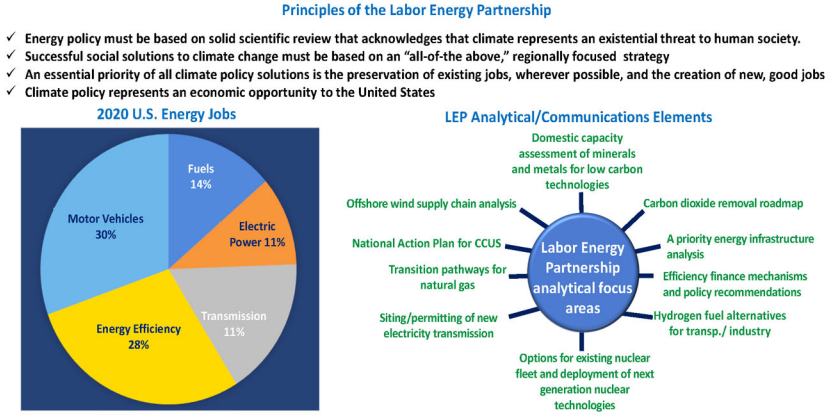
Another significant activity we are engaged in that relates directly to the topic of today's hearing is the establishment of the Labor Energy Partnership (LEP). Last Earth Day, the Energy Futures Initiative (EFI) and the AFL-CIO formed the LEP. This is a joint effort of both organizations to develop a framework the 21st Century energy system that creates and preserves quality jobs while addressing the climate crisis.

The LEP's four guiding principles demonstrate its approach to a range of issues, including grid modernization, offshore wind, CCUS, and hydrogen. These principles are: 1) Energy policy must be science-based; 2) We need an "all-of-the-above" energy strategy that is regionally focused, flexible, and preserves optionality; 3) preserving jobs, while creating new ones, is essential to climate policy; and 4) there are significant economic opportunities in the development and deployment of clean technologies and infrastructure. Figure 4 below highlights these principles as well as the 10 areas of analytical and outreach focus that guide the activities of the LEP. It also shows the distribution of energy jobs in 2020.

The Labor Energy Partnership is currently analyzing the policies needed to site and permit new electricity infrastructure projects in the near-term. It is also evaluating policy solutions to ensure rapid development of offshore wind resources along the east and west coasts, and in the Great Lakes region. In line with its wholistic approach to policy analysis, the LEP is considering local economic impacts, the opportunity to onshore the offshore wind manufacturing and supply chains, the social equity and environmental justice concerns, and the lessons learned from the existing global market.

[3] https://www.greentechmedia.com/articles/read/9-transmission-projects-laying-the-paths-for-cross-country-clean-energy

**Figure 4. US Energy Jobs by Sector; the Labor Energy Partnership**




In addition to its work with the AFL-CIO, the Energy Futures Initiative, in partnership with the National Association of State Energy Offices, conducts an annual energy jobs survey that we started at DOE when I was Secretary. The previous Administration discontinued this survey. Understanding its importance, EFI and NASEO have sustained this critical work and released a five-year trend analysis of energy jobs last year. The data in this summary analysis (all pre-COVID) indicated that energy jobs were created at twice the rate of overall jobs in the economy, a critical consideration as we work on COVID recovery.

Special attention needs to be paid to conventional energy jobs and providing the training and cross-walking to clean energy jobs. Again, offshore wind provides an example. The skills of oil and gas workers who have experience with building and maintaining offshore drilling platforms can be transferred to offshore wind platform construction and maintenance. CCUS offers another opportunity to apply the subsurface and pipeline construction and maintenance knowledge and skills of oil and gas workers to work on large scale decarbonization infrastructures. This underscores some of the key reasons why we formed the Labor Energy Partnership with the AFL-CIO last year.

## Transforming our Energy Systems: Regional Infrastructure Options are Critical

Last, and perhaps most important for the members who represent varied constituencies across the country, we need to encourage and provide policy support for regional solutions to climate change and the associated infrastructure needs. EFI has undertaken multiple projects on regional decarbonization, including reports on California and New England (in collaboration with E3), and a forthcoming report on New York City (along with ICF and Drexel University). The resources, infrastructures, emissions profiles, innovation, and policy needs vary greatly by region of the country—a "one size fits all" approach to policy and financial support will likely impede, not accelerate progress towards deep decarbonization. EV charging infrastructures will, for example, look very different in both rural and urban areas, where the typical "suburban EV model mindset" and its associated infrastructure will have little relevance.

Access to broadband offers another example, affecting the degree to which a city, town or region could be considered for any policy support as a "smart community". Smart Community initiatives must be understood and guided by digitization as the foundation for economic growth and entrepreneurial activity. While important to focus on initial apps (e.g., smart streetlights), a critical focus should be ensuring the buildout and protection of the digital backbone infrastructure that is the basis for an entrepreneurial economy in cities and communities. This backbone starts with the integrated cutting-edge smart electricity and telecommunications systems linked to big data, sensors, real-time modeling, and artificial intelligence capabilities. The backbone infrastructure will provide unforeseen entrepreneurial advances in the smart city/community and act as a magnet for talent. In addition, all these issues and considerations must accommodate regional, state, and local needs and differences, including urban and rural differences.

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Mr. Chairman, Ranking Member Rodgers, members of the Committee, I appreciate the opportunity to testify today on critical energy infrastructure issues. The Lift America Act is a very important and necessary step towards supporting the infrastructure we need for deep decarbonization of energy systems and consuming sectors and for building resilience into our infrastructures in anticipation of increasingly extreme weather patterns. I look forward to your questions.

**ATTACHMENT A TESTIMONY OF SECRETARY ERNEST MONIZ, 03/22/21**

QER 1.1 and 1.2 Recommendations Related to Infrastructure Development

This memo summarizes a subset of recommendations from the first and second QERs that directly relate to clean energy infrastructure deployment and infrastructure resilience. An appendix includes the entirety of the recommendations from both QERs, color coded to highlight relevant recommendations included in this roll-up.

### QER 1.1: Transforming U.S. Energy Infrastructure in a Time of Rapid Change

#### Increasing the Resilience, Reliability, Safety, and Asset Security of TS&D Infrastructure

- Develop comprehensive data, metrics, and an analytical framework for energy infrastructure resilience, reliability, safety, and asset security.
- Establish a competitive program to accelerate pipeline replacement and enhance maintenance programs for natural gas distribution systems.
- Support the updating and expansion of state energy assurance plans.
- Establish a competitive grant program to promote innovative solutions to enhance energy infrastructure resilience, reliability, and security.

#### Smart Grid of the Future

- Provide grid modernization R&D, analysis, and institutional support.
- Conduct a national review of transmission plans and assess barriers to their implementation.
- Provide state financial assistance to promote and integrate TS&D infrastructure investment plans for electricity reliability, affordability, efficiency, lower carbon generation, and environmental protection.

#### Improving Shared Transport Infrastructures

- Assess energy component transportation.

#### Integrating North American Energy Markets

- Partner with Canada and the Arctic Council on energy delivery to remote areas.
- Promote Caribbean energy TS&D infrastructure.

#### Addressing Environmental Aspects of TS&D Infrastructure

- Expand R&D programs at DOE on cost-effective technologies to detect and reduce losses from natural gas TS&D systems.
- Work with states to promote best practices for regulating and siting CO2 pipelines.
- Enact financial incentives for the construction of CO2 pipeline networks.

#### Siting and Permitting of TS&D Infrastructure

- Allocate resources to key Federal agencies involved in the siting, permitting, and review of infrastructure projects.
- Prioritize meaningful public engagement through consultation with Indian Tribes, coordination with state and local governments, and facilitation of non-Federal partnerships.
- Enact statutory authorities to improve coordination across agencies.
- Adopt Administration proposals to authorize recovery of costs for review of project applications.

### QER 1.2 Transforming the Nation's Electricity System

- **Protect the Electricity System as a National Security Asset.**
    - Amend Federal Power Act authorities to reflect the national security importance of the Nation's electric grid.
    - Collect information on security events to inform the President about emergency actions, as well as imminent dangers.

  - Adopt integrated electricity security planning and standards.
  - Assess natural gas/electricity system infrastructure interdependencies for cybersecurity protections.
- **Increase Financing Options for Grid Modernization.**
  - Expand DOE's loan guarantee program and make it more flexible to assist in the initial deployment of innovative grid technologies and systems.
- **Increase Technology Demonstrations and Utility/Investor Confidence.**
  - Significantly expand existing programs to demonstrate the integration and optimization of distribution system technologies.

### Maximize Economic Value and Consumer Equity

- **Increase Electricity Access and Improve Electricity-Related Economic Development on Tribal Lands.**
  - Support the achievement of full tribal land electrification
  - Support advanced technology acceleration and economic development opportunities for tribal lands.
- **Strengthen Rural Electricity and Broadband Infrastructure.**
  - Leverage utility broadband build-out to expand public broadband access in rural areas
  - Increase opportunities for small and rural utilities to utilize the Department of Agriculture's electricity financing programs.

### Enable a Clean Electricity Future

- **Address a Range of Power Plant Siting Issues.**
  - Evaluate and develop generation-siting best practices
  - Modernize electricity transmission permitting procedures.

### Grid Operations and Planning for Electricity System Reliability, Security, and Resilience

- **Support Industry, State, Local, and Federal Efforts to Enhance Grid Security and Resilience.**
  - Develop uniform methods for cost-benefit analysis of security and resilience investments for the electricity system
  - Provide incentives for energy storage
  - Support grants for small utilities facing cyber, physical, and climate threats
  - Support mutual assistance for recovering from disruptions caused by cyber threats
  - Support the timely development of standards for grid-connected devices
  - Require states to consider the value of DER, funding for public purpose programs, energy and efficiency resource standards, and emerging risks in integrated resource or reliability planning under the Public Utility Regulatory Policies Act.
- **Encourage Cost-Effective Use of Advanced Technologies that Improve Transmission Operations.**
  - Promote deployment of advanced technologies for new and existing transmission.

### Enhancing Electricity Integration in North America

- **Increase North American Cooperation on Electric Grid and Clean Energy Issues.**
  - Increase U.S. and Mexican cooperation on reliability
  - Advance North American grid security
  - Modernize international cross-border transmission permitting processes.

# APPENDIX: Full Recommendations from Both QERs

The following are the full suite of recommendation from QER 1.1 and QER 1.2, color coded as follows:

- **Green**: directly related to supporting clean energy infrastructure deployment (including reducing emissions from fossil energy infrastructure)
- **Blue**: related to improving infrastructure resilience and reliability; when both resilience and clean energy deployment are relevant, the recommendation is color coded green
- **Gray**: may not be directly relevant to clean energy infrastructure or resilience

## QER 1.1: Transforming U.S. Energy Infrastructure in a Time of Rapid Change

### Increasing the Resilience, Reliability, Safety, and Asset Security of TS&D Infrastructure

**Develop comprehensive data, metrics, and an analytical framework for energy infrastructure resilience, reliability, safety, and asset security.** DOE, in collaboration with the Department of Homeland Security and interested infrastructure stakeholders, should develop common analytical frameworks, tools, metrics, and data to assess the resilience, reliability, safety, and security of energy infrastructures.

**Establish a competitive program to accelerate pipeline replacement and enhance maintenance programs for natural gas distribution systems.** DOE should establish a program to provide financial assistance to states to incentivize cost-effective improvements in the safety and environmental performance of natural gas distribution systems through targeted funding to offset incremental costs to low-income households and funding for enhanced directed inspection and maintenance programs.

**Support the updating and expansion of state energy assurance plans.** DOE should undertake a multi-year program of support for state energy assurance plans, focusing on improving the capacity of states and localities to identify potential energy disruptions, quantify their impacts, share information, and develop and exercise comprehensive plans that respond to those disruptions and reduce the threat of future disruptions.

**Establish a competitive grant program to promote innovative solutions to enhance energy infrastructure resilience, reliability, and security.** DOE should establish a program to provide competitively awarded grants to states to demonstrate innovative approaches to TS&D infrastructure hardening and enhancing resilience and reliability. A major focus of the program would be the demonstration of new approaches to enhance regional grid resilience, implemented through the states by public and publicly regulated entities on a cost-shared basis.

**Analyze the policies, technical specifications, and logistical and program structures needed to mitigate the risks associated with loss of transformers.** As part of the Administration's ongoing efforts to develop a formal national strategy for strengthening the security and resilience of the entire electric grid for threats and hazards (planned for release in 2015), DOE should coordinate with the Department of Homeland Security and other Federal agencies, states, and industry on an initiative to mitigate the risks associated with the loss of transformers. Approaches for mitigating this risk should include the development of one or more transformer reserves through a staged process.

**Analyze the need for additional or expanded regional product reserves.** DOE should undertake updated cost-benefit analyses for all of the regions of the United States that have been identified as vulnerable to fuel supply disruptions to inform subsequent decisions on the possible need for additional regional product reserves.

**Integrate the authorities of the President to release products from regional petroleum product reserves into a single, unified authority.** Congress should amend the trigger for the release of fuel from the Northeast Home Heating Oil Reserve and from the Northeast Gasoline Supply Reserve so that they are aligned and properly suited to the purpose of a product reserve, as opposed to a crude oil reserve.

## Smart Grid of the Future

**Provide grid modernization R&D, analysis, and institutional support.** DOE should continue to pursue a multi-year, collaborative, and cost-shared research and development, analysis, and technical assistance program for technology innovation that supports grid operations, security, and management; and for analyses, workshops, and dialogues to highlight key opportunities and challenges for new technology to transform the grid.

**Establish a framework and strategy for storage and grid flexibility.** DOE should conduct regional and state analyses of storage deployment to produce a common framework for the evaluation of benefits of storage and grid flexibility, and a strategy for enabling grid flexibility and storage that can be understood and implemented by a wide range of stakeholders.

**Conduct a national review of transmission plans and assess barriers to their implementation.** DOE should carry out a detailed and comprehensive national review of transmission plans, including assessments on the types of transmission projects proposed and implemented, current and future costs, consideration of interregional coordination, and other factors. A critical part of this review should be to assess incentives and impediments to the development of new transmission.

**Provide state financial assistance to promote and integrate TS&D infrastructure investment plans for electricity reliability, affordability, efficiency, lower carbon generation, and environmental protection.** In making awards under this program, DOE should require cooperation within the planning process of energy offices, public utility commissions, and environmental regulators within each state; with their counterparts in other states; and with infrastructure owners and operators and other entities responsible for maintaining the reliability of the bulk power system.

**Coordinate goals across jurisdictions.** DOE should play a convening role to bring together public utility commissioners, legislators, and other stakeholders at the Federal, state, and tribal levels to explore approaches to integrate markets, while respecting jurisdictional lines, but allowing for the coordination of goals across those lines.

**Value new services and technologies.** DOE should play a role in developing frameworks to value grid services and approaches to incorporate value into grid operations and planning. It should convene stakeholders to define the characteristics of a reliable, affordable, and environmentally sustainable electricity system and create approaches for developing pricing mechanisms for those characteristics. The goal should be to develop frameworks that could be used by the Federal Energy Regulatory Commission, state public utility commissions in ratemaking proceedings, Regional Transmission Organizations in their market rule development, or utilities in the operation and planning of their systems.

**Improve grid communication through standards and interoperability.** In conjunction with the National Institute of Standards and Technology and other Federal agencies, DOE should work with industry, the Institute of Electrical and Electronics Engineers, state officials, and other interested parties to identify additional efforts the Federal Government can take to better promote open standards that enhance connectivity and interoperability on the electric grid.

**Establish uniform methods for monitoring and verifying energy efficiency.** Through its Uniform Methods Project, DOE should accelerate the development of uniform methods for measuring energy savings and promote widespread adoption of these methods in public and private efficiency programs.

## Modernizing U.S. Energy Security Infrastructures in a Changing Global Marketplace

**Update SPR release authorities to reflect modern oil markets.** Congress should update SPR release authorities to allow the SPR to be used more effectively to prevent serious economic harm to the United States in case of energy supply emergencies.

**Invest to optimize the SPR's emergency response capability.** DOE should analyze appropriate SPR size and configuration, and, after carrying out detailed engineering studies, DOE should make infrastructure investments to the SPR and its distribution systems to optimize the SPR's ability to protect the U.S. economy in an energy supply emergency.

**Support other U.S. actions related to the SPR and energy security infrastructures that reflect a broader and more contemporary view of energy security.** The United States should continue to consult with allies and key energy trading partners on energy security issues, building on the G-7 principles on energy security.

**Support fuels diversity through research, demonstration, and analysis.** DOE and the Department of Defense should continue research and demonstration activities to develop biofuels that are compatible with existing petroleum fuel infrastructure, especially in aviation and for large vehicles. DOE should provide technical support to states, communities, or private entities wishing to invest in infrastructure to dispense higher-level ethanol blends. DOE should ensure adequate support for data collection and analysis on fuels, like propane, that play an important role in the Nation's diverse energy mix and where delivery is challenged by changing TS&D infrastructures.

**Undertake a study of the relationship between domestic shipping and energy security.** The relevant agencies should conduct a study of the economic, engineering, logistics, workforce, construction, and regulatory factors affecting the domestic shipping industry's ability to support U.S. energy security. The Secretary of Transportation should ensure that the National Maritime Strategy includes a consideration of the energy security aspects of maritime policy in its discussion and recommendations.

## Improving Shared Transport Infrastructures

**Enhance the understanding of important safety-related challenges of transport of crude oil and ethanol by rail and accelerate responses.** Key activities at DOE and DOT should be strongly supported.

**Further analyze the effects of rail congestion on the flow of other energy commodities, such as ethanol and coal.** DOE, STB, and the Federal Energy Regulatory Commission should continue to develop their understanding of how rail congestion may affect the delivery of these energy commodities.

**Analyze the grid impacts of delayed or incomplete coal deliveries.** In assessing these issues, DOE and other relevant agencies should examine whether a minimum coal stockpile for electricity reliability should be established for each coal-fired unit.

**Address critical energy data gaps in the rail transport of energy commodities and supplies.** Congress should fund the President's FY 2016 Budget Request for the EIA to address critical energy transportation data gaps and continued data sharing with the STB.

**Support alternative funding mechanisms for waterborne freight infrastructure.** The Administration should form an ongoing Federal interagency working group to examine alternative financing arrangements for waterborne transportation infrastructure and to develop strategies for public-private partnerships to finance port and waterway infrastructure.

**Support a new program of competitively awarded grants for shared energy transport systems.** A new grant program—Actions to Support Shared Energy Transport Systems, or ASSETS—should be established and supported at DOT, in close cooperation with DOE. This program should be dedicated to improving energy transportation infrastructure connectors. A Federal investment in ASSETS would likely mobilize additional and significant non-Federal investment, based on typical TIGER cost shares.

**Support public-private partnerships for waterborne transport infrastructure.** Developing a set of shared priorities for investment ensures that public and private sector needs are met.

**Coordinate data collection, modeling, and analysis.** DOE should lead an interagency effort with DOT, the Department of Agriculture, the Army Corps of Engineers, and the Coast Guard—in cooperation with other relevant agencies with data regarding marine, rail, and other energy transport modes—to improve and coordinate their respective data collection, analytical, and modeling capabilities for energy transport on shared infrastructures.

**Assess the impacts of multi-modal energy transport.** DOE, working with DOT and the Army Corps of Engineers, should conduct a one-time comprehensive needs assessment of investment needs and opportunities to upgrade the Nation's energy-related shared water transport infrastructure.

**Assess energy component transportation.** DOE, in coordination with relevant agencies, should examine routes for transportation of energy system-related equipment, materials, and oversized components. The assessment would include the capacity of the Nation's transportation infrastructure systems to safely accommodate more frequent and larger shipments where analyses indicate such transport will be required.

## Integrating North American Energy Markets

**Continue advances that have been made in the North American energy dialogue.** The United States, Canada, and Mexico should encourage further business exchanges and regular minister-level engagement.

**Increase the integration of energy data among the United States, Canada, and Mexico.** Provide resources for the EIA to collaborate with its Canadian and Mexican counterparts to systematically compare their respective export and import data, validate data, and improve data quality. In addition, efforts should be taken to better share geographic information system data to develop energy system maps and review forward-looking assessments and projections of energy resources, flows, and demand.

**Undertake comparative and joint energy system modeling, planning, and forecasting.** Enhance comparative and joint modeling, planning, and forecasting activities among U.S., Canadian, and Mexican energy ministries and related governmental agencies. The current scale of activities has aided bilateral and individual goals; however, increasing trilateral engagement on planning, modeling, or forecasting activities would capture greater efficiencies and enhance each country's ability to reach economic, security, and environmental goals. DOE's Offices of Energy Policy and Systems Analysis and International Affairs would lead modeling workshops with their Canadian and Mexican counterparts to share methodologies and collaborate on North American analysis.

**Establish programs for academic institutions and not-for-profits to develop legal, regulatory, and policy roadmaps for harmonizing regulations across borders.** In partnership with universities, qualified not-for-profits, and relevant U.S. energy regulatory authorities, state/provincial, local, and national energy regulations will be compared to identify gaps, best practices, and inconsistencies with regulations in Canada and/or Mexico with the goal of harmonization.

**Coordinate training and encourage professional interactions.** This should involve the technical staff in government agencies of the three North American countries that share similar responsibilities to evaluate and implement cross-border energy projects.

**Partner with Canada and the Arctic Council on Arctic energy safety, reliability, and environmental protection.** Joint work should emphasize research and information sharing on the effects of spills and the effectiveness of countermeasures, the identification and mobilization of the resources necessary to mitigate the effects of a pollution incident, and the development of international guidelines for preparedness and response in this logistically challenging region.

**Partner with Canada and the Arctic Council on energy delivery to remote areas.** This should be done through promoting and disseminating the work of the Remote Community Renewable Energy partnership.

**Promote Caribbean energy TS&D infrastructure.** As part of a larger Caribbean strategy, the United States should support the diversification of energy supplies, including actions to facilitate the introduction of cleaner forms of energy and development of resilient energy TS&D infrastructure in the Caribbean.

## Addressing Environmental Aspects of TS&D Infrastructure

**Improve quantification of emissions from natural gas TS&D infrastructure.** Congress should approve the $10 million requested in the FY 2016 Budget to help update Greenhouse Gas Inventory estimates of methane emissions from natural gas systems. DOE and EPA should undertake a coordinated approach, building on stakeholder input, to ensure that new research and analysis is targeted toward knowledge gaps unaddressed by other researchers.

**Expand R&D programs at DOE on cost-effective technologies to detect and reduce losses from natural gas TS&D systems.** DOE should leverage its R&D efforts in this area to facilitate broader air quality benefits.

**Invest in R&D to lower the cost of continuous emissions monitoring equipment.** To further improve safety and reduce emissions from natural gas systems, additional R&D—as proposed in the FY 2016 Budget—is needed to reduce costs and enable deployment of continuous emissions monitoring technologies.

**Support funding to reduce diesel emissions.** To protect workers and nearby communities through further reductions in diesel particulate matter emissions from ports and rail yards, the Administration proposed, and Congress should provide, funding for the Diesel Emissions Reduction Act and other related programs.

**Collaborate on R&D on the beneficial use and/or disposal of dredging material.** The Army Corps of Engineers and other appropriate Federal agencies should undertake collaborative R&D on treating and then either beneficially using or disposing of dredging material.

**Improve environmental data collection, analysis, and coordination.** DOE should work with other Federal agencies to improve data and analysis on the environmental characteristics and impacts of TS&D infrastructures.

**Work with states to promote best practices for regulating and siting CO2 pipelines.** Building on successful state models for CO2 pipeline siting, DOE, in cooperation with Federal public land agencies, should take a convening role to promote communication, coordination, and sharing of lessons learned and best practices among states that are already involved in siting and regulating CO2 pipelines or that may have CO2 pipeline projects proposed within their borders in the future.

**Enact financial incentives for the construction of CO2 pipeline networks.** Congress should enact the Administration's proposed Carbon Dioxide Investment and Sequestration Tax Credit, which would authorize $2 billion in refundable investment tax credits for carbon capture technology and associated infrastructure (including pipelines) installed at new or retrofitted electric generating units that capture and permanently sequester CO2.

## Enhancing Employment and Workforce Training

**Support an energy-job skills training system through the interagency Skills Working Group.** The training system should include new curricula, apprenticeship programs, industry-based credentialing standards, and innovative online learning systems.

**Expand support for an open-source learning community to develop, facilitate, and expand use of state-of-the art courses in energy-related fields.** These efforts should work to maintain and improve the National Training and Education Resource platform.

**Coordinate efforts to accelerate the development of high-quality energy and manufacturing curricula and apprenticeship programs.** DOE should coordinate with existing Department of Labor and National Science Foundation programs.

**Facilitate national credentials for energy occupations.** DOE should support and facilitate an industry-led process of defining needed skills in a number of emerging occupations.

**Facilitate the transition of military veterans into the energy sector.** DOE should work with the Departments of Labor and Defense and stakeholders to standardize the applicability of Military Occupation Codes to civilian jobs in energy sectors.

**Establish an interagency working group to reform existing energy jobs data collection systems.** DOE should convene a group with the Departments of Labor and Commerce to provide complete and consistent definitions and quantification of energy jobs across all sectors of the economy.

## Siting and Permitting of TS&D Infrastructure

**Allocate resources to key Federal agencies involved in the siting, permitting, and review of infrastructure projects.** Federal agencies responsible for infrastructure siting, review, and permitting have experienced dramatic appropriations cuts and reductions in staff. Many of the components of the overall effort to improve

the Federal siting and permitting processes have been stymied in recent years by appropriations shortfalls. Congress should fully fund these priorities.

**Prioritize meaningful public engagement through consultation with Indian Tribes, coordination with state and local governments, and facilitation of non-Federal partnerships.** Early and meaningful public engagement with affected residential communities, nonprofit organizations, and other non-Federal stakeholders through the NEPA process and other forums can reduce siting conflicts. Federal agency coordination with state and local governments and government-to-government consultation with affected Indian Tribes should remain a Federal Government priority. When possible, Federal agencies should co-locate energy infrastructure environmental review and permitting staff from multiple Federal agencies' regional and field offices.

**Expand landscape- and watershed-level mitigation and conservation planning.** When adverse impacts to the Nation's landscape cannot be avoided or minimized any further, Federal agencies should seek innovative approaches to compensate for adverse project impacts commensurate with the scope and scale of the project and effects to resources. Through mitigation planning at a landscape, ecosystem, or watershed scale, agencies can locate mitigation activities in the most ecologically important areas.

**Enact statutory authorities to improve coordination across agencies.** Congress should authorize and fund the Interagency Infrastructure Permitting Improvement Center in DOT, as set forth in Section 1009 of the Administration's draft legislation for the GROW AMERICA Act.

**Adopt Administration proposals to authorize recovery of costs for review of project applications.** Consistent with the proposal in the President's FY 2016 Budget Request, additional flexibility for certain agencies to accept funds from applicants would be appropriate and could expedite the Federal permitting and review process.

## QER 1.2 Transforming the Nation's Electricity System

1. **Protect the Electricity System as a National Security Asset.** The Federal Power Act provides a statutory foundation for an electricity reliability organization to develop reliability standards for the bulk power system. Pursuant to this authority, the Federal Energy Regulatory Commission (FERC) has certified the North American Electric Reliability Corporation (NERC) as the electric reliability organization. Under this arrangement, NERC and FERC have put into place a comprehensive set of binding reliability standards for the bulk power system over the past decade, including standards on cybersecurity and physical security. However, the Federal oversight authority is limited: FERC can approve or reject NERC-proposed reliability standards, but it cannot author or modify reliability standards.

   The nature of a national security threat, however, as articulated in the Fixing America's Surface Transportation Act (FAST Act), stands in stark contrast to other major reliability events that have caused regional blackouts and reliability failures in the past. In the current environment, the U.S. grid faces imminent danger from cyber attacks, absent a discrete set of actions and clear authorities to inform both responses and threats. Widespread disruption of electric service because of a transmission failure initiated by a cyber attack at various points of entry could undermine U.S. lifeline networks, critical defense infrastructure, and much of the economy; it could also endanger the health and safety of millions of citizens. Also, natural gas plays an increasingly important role as fuel for the Nation's electricity system; a gas pipeline outage or malfunction due to a cyber attack could affect not only pipeline and related infrastructures, but also the reliability of the Nation's electricity system.

   - **Amend Federal Power Act authorities to reflect the national security importance of the Nation's electric grid.** Grid security is a national security concern—the clear and exclusive purview of the Federal Government. The Federal Power Act, as amended by the FAST Act, should be further amended by Congress to clarify and affirm the Department of Energy's (DOE's) authority to develop preparation and response capabilities that will ensure it is able to issue a grid-security emergency order to protect critical electric infrastructure from cyber attacks, physical incidents, electromagnetic pulses (EMPs), or geomagnetic storms. In this regard, Federal authorities should include the ability to address two-way flows that create vulnerabilities across the entire system. DOE should be supported in its development of exercises and its facilitation of the penetration testing necessary to fulfill FAST Act emergency authorities. In the area of cybersecurity, Congress should provide FERC with authority to modify NERC-proposed reliability standards—or to promulgate new standards directly—if it finds that expeditious action is needed to protect national security in the face of fast-developing new threats to the grid. This

narrow expansion of FERC's authority would complement DOE's national security authorities related to grid-security emergencies affecting critical electric infrastructure and defense critical electricity infrastructure. This approach would maintain the productive NERC-FERC structure for developing and enforcing reliability standards, but would ensure that the Federal Government could act directly if necessary to address national security issues.

- **Collect information on security events to inform the President about emergency actions, as well as imminent dangers.** DOE should collect targeted data on critical cyber, physical, EMP, and geomagnetic disturbance events and threats to the electric grid to inform decision making in the event of an emergency or to inform the anticipatory authorities in the FAST Act. DOE should concurrently develop appropriate criteria, processes, and definitions for collecting these targeted data using a dedicated information protection program to safeguard utility data consistent with FERC rules. Reporting will be done on a confidential basis. Updating will be required to address evolving threats. DOE will coordinate the development of analytical data-surveillance and data-protection tools with the National Labs, states, universities, industry, Federal agencies, and other organizations as appropriate.

- **Adopt integrated electricity security planning and standards.** FERC should, by rule, adopt standards requiring integrated electricity security planning on a regional basis to the extent consistent with its statutory authority. Such requirements would enhance DOE's effectiveness in carrying out its responsibilities and authorities to address national security imperatives and new vulnerabilities created by (1) two-way flows of information and electricity and (2) the transactive role of customers and key suppliers (such as those providing stored fuel for strategic generators). Important national security considerations warrant careful consideration of how generation, transmission, distribution, and end-user assets are protected from cybersecurity risks. Vulnerabilities of distribution and behind the-meter assets, which may provide an increasing number of potential entry points for access to utility control systems, are threats that can adversely affect the operation of the transmission system; for these vulnerabilities, a careful review of protections is required. To adequately address and support the security requirements of the FAST Act and DOE's implementation of the FAST Act, this review should be performed on an integrated basis, rather than separating the review into bulk power system and other assets.

  To ensure that there are no unnecessary vulnerabilities associated with state-to-state or utility-to utility variations in protections, integrated electricity security planning should be undertaken to cover the entire United States, including Alaska, Hawaii, and U.S. territories. FERC should consider having existing regional organizations undertake such planning, as it deems appropriate. FERC should evaluate whether the costs of implementing security measures identified in the integrated electricity security plan are appropriate for regional cost allocation, where such measures are found to enhance the security of the regional transmission electric system.

  To the extent necessary, appropriate statutes should be amended to clearly authorize FERC to adopt such integrated electricity security planning requirements. However, FERC should immediately begin to advance this initiative to the maximum extent possible under its current authority by initiating a dialogue, including discussions with DOE and state authorities, and driving consensus on integrated electricity security plans.

- **Assess natural gas/electricity system infrastructure interdependencies for cybersecurity protections.** DOE, pursuant to FAST Act authorities and in coordination with FERC, should assess current cybersecurity protections for U.S. natural gas pipelines and associated infrastructure to determine whether additional or mandatory measures are needed to protect the electricity system. If the assessment concludes that additional cybersecurity protections—including mandatory cybersecurity protocols—for natural gas pipelines and associated infrastructure are necessary to protect the electricity system, such measures and protocols should be developed and implemented. This work should build on existing assessments, including those underway at the Transportation Security Administration.

2. **Increase Financing Options for Grid Modernization.** Estimates of total investment requirements necessary for grid modernization range from a low of about $350 billion to a high of about $500 billion. Grid modernization is the platform for the 21st-century electricity system, bringing significant value associated with lower electricity bills due to fuel and efficiency savings, more electricity choices, and fewer and shorter

outages. The Federal Government currently plays a role in providing tax incentives for deployment of clean energy technologies, as well as Federal credit assistance to facilitate early deployment of innovative technologies.

- **Expand DOE's loan guarantee program and make it more flexible to assist in the initial deployment of innovative grid technologies and systems.** The design of the current DOE loan guarantee program is focused primarily on financing deployment of innovative generation technologies. Most DOE loan guarantee recipients, for example, are structured as special project entities that can raise equity outside of regulated business structures and can provide credit security in the form of power purchase agreements. This financing model is not amenable to grid modernization financing by regulated entities, especially in cases of some technological uncertainty associated with initial commercial deployments. In addition, there will be an ongoing need for innovation in grid technologies beyond the likely availability of current DOE loan guarantee authority. Also, the limitations of the loan program restrict the program to a very small and ever-changing portion of new transmission capacity; more projects and innovation are necessary to transform the grid.

  Modifications to the current DOE Title XVII Loan Guarantee Program are needed to (1) reduce restrictions on numbers/types of projects and time frames (e.g., in order to adequately address innovative transmission capacity needs) and (2) provide clear statutory authority for lending to other public or public/private entities that support transmission and other grid modernization projects (e.g., state agencies, regional power pools) through on-lending or equity investing. By their nature, transmission projects, especially big projects, involve many entities and jurisdictions. Statutory clarification is needed on indirect lending authorities to such entities for multi-jurisdictional projects.

  Some of the benefits of grid modernization will be realized over time as the electricity system itself is changed by technology and market innovations. Additional funding resources would bridge the gap between investment costs and realization of benefits and would enable utilities to invest in grid modernization. A relatively low-cost, permanent Federal financing system could be established by setting up a revolving loan fund with one-time seed capital.

3. **Increase Technology Demonstrations and Utility/Investor Confidence.** The future electric grid will require that utilities deploy a wide range of new, capital-intensive technologies. Primary technologies are needed to support increased reliability, security, value creation, consumer preferences, and system optimization and integration at the distribution level. Demonstrating the technical readiness and economic viability of advanced technologies is needed to inspire the confidence of utilities and investors.

   - **Significantly expand existing programs to demonstrate the integration and optimization of distribution system technologies.** The complexity of the issues facing distribution systems— including new technologies, the need for systems approaches, and geographical differences in markets and regulatory structures—points to a significant need for multiple "solution sets" to enable two way electricity flows on distribution systems, enhance value, maximize clean energy opportunities, optimize grid operations, and provide secure communications. Building on existing demonstration programs and reflecting the Administration's commitment to the doubling of Federal clean energy innovation over 5 years as part of its Mission Innovation initiative, DOE should develop a focused, cost-shared program for qualifying utilities to demonstrate advanced distribution system technologies at the community scale, including advanced voltage control/optimization systems; dynamic protection schemes to manage reverse power flows, communications, sensors, storage, switching, and smart inverter networks; and advanced distribution-management systems, including automated substations.

     Demonstrations supported by the cost-shared, cooperative agreement program would be specifically designed to inform standards and regulations and increase regulatory and utility confidence in key technologies or technology systems. Under this program, utilities would have to make a positive business case for projects and obtain regulatory approvals for their proposed demonstrations. Preference would be given to multi-utility partnerships with diverse customer profiles and to projects that promote education and training in key academic disciplines that are essential for distribution system transformation. Cybersecurity plans for all projects would be required and supported by programmatic review of plans and deployments.

     Existing DOE programs, including advanced distribution-management systems, microgrids, communications and sensors, storage, and cybersecurity, should be leveraged to provide technical

assistance regarding technological issues, planning and performance evaluation, and institutional needs. A percentage of funding could be dedicated to small, publicly owned utilities. The program should be of sufficient size to have a material impact; it should start in fiscal year 2018 and be ramped up over the time period identified in the Mission Innovation initiative.

4. **Build Capacity at the Federal, State, and Local Levels.** The 21st-century electricity system is becoming increasingly transactive, and properly valuing attributes is key to an efficient system. Application of lessons learned that pair economic and system analysis will lead to a power system that cost-effectively serves customers while providing nationally valued public goods (e.g., reliability, resilience, and acceptable environmental performance).

   Advances in electricity technologies (i.e., smart grid processes and solutions) require enhanced capabilities in human resources to ensure the cost-effective selection, deployment, and operations of key technologies.

   - **Provide funding assistance to enhance analytical capabilities in state public utility commissions and improve access to training and expertise for small and municipal utilities.** Federal support should be provided to states and small utilities to enable them to better manage the increasing complexities in the electricity system, such as integrating variable energy resources; incorporating energy efficiency, demand response (DR), and storage into planning; developing competencies in various technologies; and making investment and security decisions within uncertain parameters. These issues are highly technical and require a new knowledge base and skillset often within the domain of computer sciences, economics, and cybernetics. At the same time, these entities are dealing with the workforce issues of outside recruitment or retirement across the electricity industry, which are referenced in the QER 1.2. DOE should build and cultivate much-needed analytical capacity at the state level over a limited period of time by allocating funding to state public utility commissions to allow them to hire new or train existing analysts with more sophisticated and advanced skills and build institutional knowledge. Eligibility for state and local funding should be contingent upon demonstration of consideration for integrated system planning, which is outlined in Chapter VII (A 21st-Century Electricity System: Conclusions and Recommendations). DOE should support these analysts through an online interactive education and training platform with access to nationally recognized experts. This platform would also be available and tailored to the needs of small utilities. On a national scale, these actions will serve to sustain system reliability and security and bolster resilience.

   - **Create a Center for Advanced Electric Power System Economics.** DOE should provide 2 years of seed funding for the formation of a center designed to provide social science advice and economic analysis on an increasingly transactive and dynamic 21st-century electricity system. The center should be modeled after the National Bureau of Economic Research and be managed by a university consortium. The consortium will establish and maintain a network of experts in economics, the social sciences, and the electricity system; these experts should be from academia, industry, nonprofit institutions, and the National Laboratories. The center will develop new methods where appropriate, serve as advisor and consultant to stakeholders preparing germane analyses, and foster the advancement of students and professionals who are developing expertise in these disciplines. The focus of the center will include power systems evaluation (e.g., valuation, benefit-cost, and competition analysis).

5. **Inform Electricity System Governance in a Rapidly Changing Environment.** The rapid rate of change in the electricity sector today often exceeds the ability of institutions and governance structures to respond in a manner sufficient to meet critical national goals and objectives. This is particularly true in the resolution of jurisdictional disputes over responsible price formation and valuation. Clarification and harmonization of roles and responsibilities for developing pricing can reduce market uncertainty, facilitate the achievement of policy goals, and reduce costs to ratepayers.

   - **Establish a Federal Advisory Committee on Alignment of Responsibilities for Rates and Resource Adequacy.** DOE, in collaboration with the National Association of Regulatory Utility Commissioners, should convene a Federal advisory committee that reports to the Secretary or the Secretary's designee to examine potential jurisdictional concerns and issues associated with harmonizing wholesale and retail rates and tariffs. This advisory committee will evaluate and make recommendations (where appropriate) on the way in which the organized markets reflect state policy; pricing mechanisms for maintaining resource adequacy; state and Federal roles in pricing and operation of DER, storage, and

microgrids; the role of aggregators; and mechanisms for implementing consumer protection across the various markets and jurisdictions. The advisory committee will represent a broad cross-section of industry and stakeholders. An annual report will be prepared by this advisory committee for the Secretary that identifies the impact of governance issues and recommends solutions.

In the remainder of this summary, we highlight a few recommendations from a much more extensive set in the full report.

## Maximize Economic Value and Consumer Equity

**Tailor and Increase Tools and Resources for States and Utilities to Effectively Address Transitions Underway in the Electricity System.** States and electric utilities are responsible for making critical decisions regarding how to improve the reliability, affordability, and sustainability of the electric grid, and officials from state agencies and utilities provided comments as part of the QER stakeholder process on the Federal role in informing these decisions. Technical assistance, improved regional consideration in program offerings, and new analysis for decision making will allow the Federal Government to respond to the needs of states and utilities in ensuring consumer value and equity in the electricity system of the 21st century. Recommendations include the following:

- Improve energy management and DR in buildings and industry
- Increase Federal support for state efforts to quantitatively value and incorporate energy efficiency, DR, distributed storage, and distributed generation into resource planning.

**Expand Federal and State Financial Assistance to Ensure Electricity Access for Low-Income and Underserved Americans.** Analysis indicates that electricity costs represent a disproportionate share of total income for low-income Americans. Increased funding for proven, state-administered programs and enhanced data and tools for targeting assistance can reduce this "electricity burden." Ensuring that the costs of the rapid transition of the electricity system are not disproportionately borne by low-income Americans is a top priority; low-income Americans should also be able to share in the benefits from an electricity system transition. Recommendations include the following:

- Encourage public-private partnerships to underwrite and support clean energy access for low- and moderate-income households
- Provide assistance to address rural, islanded, and tribal community electricity needs.

**Increase Electricity Access and Improve Electricity-Related Economic Development on Tribal Lands.** The interdependencies of electricity access, health, economic wellbeing, and quality of life underscore the importance of universal access to electricity. While recent data on electricity access on tribal lands is limited, there are still areas that lack adequate access to electricity despite the Nation's commitment to full electrification dating back to the Rural Electrification Act of 1936. More recent anecdotal evidence suggests that the problem broadly persists. It is a moral imperative that the Federal Government support tribal leadership and utility authorities to provide basic electricity service for the tens of thousands of Native Americans who currently lack access to electricity and to foster the associated economic development on tribal lands. Federal agencies should also support renewable energy acceleration and economic development opportunities through renewable energy incentives, workforce development, financing program improvements, and improved consultation with tribes. Recommendations include the following:

- Support the achievement of full tribal land electrification
- Support advanced technology acceleration and economic development opportunities for tribal lands.

**Strengthen Rural Electricity and Broadband Infrastructure.** The Federal Government has historically supported the expansion of access to affordable electricity and communications services in rural America, with major initiatives continuing today mainly through the Department of Agriculture. The lack of access to broadband in rural areas means that these consumers lack access to DR technologies, such as smart meters, smart thermostats, and other technologies that can reduce pollution, help consumers save electricity, improve overall grid resilience and reliability, and enhance economic development. Broadband expansion into these regions would significantly advance grid modernization goals, while providing significant communications, connectivity, and educational benefits to numerous regions of the country. Supporting broadband access in sparsely populated rural areas, many of which are low-income areas, is not, however, profitable for the private sector.

Federal support would help enhance security, environmental, and economic development goals. Recommendations include the following:

- Leverage utility broadband build-out to expand public broadband access in rural areas
- Increase opportunities for small and rural utilities to utilize the Department of Agriculture's electricity financing programs.

## Enable a Clean Electricity Future

**Transform the Electricity System through Leadership in National Clean Electricity Technology Innovation.** Private-sector investment in clean energy technology faces many barriers. For example, prices do not reflect the costs and benefits of clean energy, investments are made in a highly regulated environment, and there are high capital costs and the long time horizons for research and development (R&D) and capital stock turnover in comparison to many other sectors (e.g., information technology). Increased investments in electricity technology innovation is essential for transformation of the electricity system. Federal investments have a history of success and have been leveraged by the private sector to create significant economic value; case studies on nuclear energy, shale gas, and solar photovoltaic, among many other electricity-related technologies, demonstrate the instrumental role of Federal investment in early-stage R&D. Recommendations include the following:

- Significantly increase Federal investment in clean electricity research, development, and demonstration
- Implement Regional Clean Energy Innovation Partnerships.

**Address Challenges to Large-Scale, Centralized Clean Generation.** Regardless of the energy source, there are a number of challenges to deploying large, centralized power-generation facilities. Lower electricity prices, largely related to low-cost natural gas, are reducing the economic viability of other clean generation resources, especially nuclear energy. Nuclear power currently provides 60 percent of zero-carbon generation in the United States. Hydropower is one of the oldest and most established forms of electricity generation, contributing 6 percent of the electricity generated in the United States in 2015 and 19 percent of zero-carbon generation. Non-hydropower renewables—including wind, solar, geothermal, and biomass—accounted for about 7 percent of electricity generated in the United States in 2015. Each of these technologies faces a range of siting constraints, licensing and permitting processes, or environmental concerns, which can be broad and extensive; this can make new, large-scale deployments difficult—in some cases, taking a decade or more to build. A combination of Federal coordination, licensing support, analysis of financing opportunities, and research, development, and demonstration can help address these barriers. Recommendations include the following:

- Increase funding for the life-extension R&D program to ensure maximum benefits from existing nuclear generation
- Increase support for advanced nuclear technology licensing at the Nuclear Regulatory Commission
- Develop environmental mitigation technologies for hydropower.

**Address Significant Energy-Water Nexus Issues Affecting—and Affected by—the Electricity Sector.** Electricity systems and water systems are in many cases interconnected. Water is a critical requirement for many electricity-generation technologies. Two-thirds of total U.S. electricity generation—including many coal, natural gas, nuclear, concentrated solar power, and geothermal plants—requires water for cooling. In addition, carbon capture, utilization, and storage (CCUS) technologies have significant water demands. Electricity is also required for water and wastewater conveyance, treatment, and distribution. From a full-system perspective, the joint reliance of electricity and water systems can create vulnerabilities (e.g., drought impacts on thermoelectric generation and hydropower), but it can also create opportunities for each system to benefit from well-designed integration. Such challenges and opportunities can be addressed through improved policy integration; data collection; modeling; analysis; research, development, demonstration, and deployment; and engagement with stakeholders. Recommendations include the following:

- Launch an electricity-related Energy-Water Nexus Policy Partnership with Federal, state, and local partners.

**Provide Federal Incentives for a Range of Electricity-Related Technologies and Systems.** A package of tax incentives targeted at specific market segments can support an all-of-the-above energy strategy by helping to reduce the costs of deploying and using innovative, commercially available energy technologies. The economies of scale and "learning by doing" promoted by such deployments support continued technology cost reductions and greater market competition. Recommendations include the following:

- Expand the time frame and the total capacity allowed under the Production Tax Credit for nuclear generation
- Provide tax credits for CCUS
- Increase power purchasing authorities for the Federal Government from 10 to 20 years.

**Address a Range of Power Plant Siting Issues.** The land-use requirements for different types of power generation reflect significant differences between the various types of infrastructure and their operational requirements. Recommendations include the following:

- Evaluate and develop generation-siting best practices
- Modernize electricity transmission permitting procedures.

## Grid Operations and Planning for Electricity System Reliability, Security, and Resilience

**Support Industry, State, Local, and Federal Efforts to Enhance Grid Security and Resilience.** Some types of extreme weather events are projected to increase in frequency and intensity due to climate change. Cyber threats to the electricity system are increasing in sophistication, magnitude, and frequency. Physical threats remain a concern for industry. These challenges could be mitigated through a combination of cost-benefit analyses, standards, and collaboration across industry, state, local, and Federal stakeholders. The following recommendations build upon and extend current initiatives, such as DOE's Grid Modernization Initiative and Partnership for Energy Sector Climate Resilience. Recommendations include the following:

- Develop uniform methods for cost-benefit analysis of security and resilience investments for the electricity system
- Provide incentives for energy storage
- Support grants for small utilities facing cyber, physical, and climate threats
- Support mutual assistance for recovering from disruptions caused by cyber threats
- Support the timely development of standards for grid-connected devices
- Require states to consider the value of DER, funding for public purpose programs, energy and efficiency resource standards, and emerging risks in integrated resource or reliability planning under the Public Utility Regulatory Policies Act.

**Improve Data for Grid Security and Resilience.** As the Nation increasingly relies on electricity to power the economy and support consumer options and choices, the consequences of electricity outages are rising. The United States currently lacks sufficient data on all-hazard events and losses. Such data would help utility regulators, planners, and communities analyze and prioritize security and resilience investments. Recommendations include the following:

- Enhance coordination between Energy Sector Information Sharing and Analysis Centers and the intelligence communities to synthesize threat analysis and disseminate it to industry in a timely and useful manner.

**Encourage Cost-Effective Use of Advanced Technologies that Improve Transmission Operations.** Permitting and planning are necessary but complex processes that can slow transmission development and increase costs. Other barriers restrain the use of new technologies that can increase transmission system capacity utilization and improve reliability and security, as well as other planning priorities. Recommendations include the following:

- Promote deployment of advanced technologies for new and existing transmission.

**Improve the Energy Information Administration's (EIA's) Electricity Data, Modeling, and Analysis Capabilities.** EIA provides all levels of stakeholders—government, companies, and customers—with data to inform the evaluation and development of policies that affect the electricity grid. More timely and publicly accessible data on how system operations are changing and how efficiency and renewable energy are specifically affecting them would facilitate the development of Federal and state policies and investments needed to ensure the reliability, resilience, and security of the grid. Substantially improved electricity transmission data and related analyses by EIA would support significant improvements in the effectiveness of a broad range of government policies and programs, including market design and transmission planning. Recommendations include the following:

- Expand economic modeling capability for electricity
- Expand EIA data collection on energy end use
- Support EIA's collection of additional data on electricity and water flow for water and wastewater.

## Electricity Workforce of the 21st Century: Changing Needs and New Opportunities

**Support the Electricity Sector Workforce.** The electricity sector is undergoing a number of significant shifts in structure, energy sources, and applications as the industry modernizes and evolves. The full potential of these shifts, however, will only be realized if the electricity sector workforce appropriately adapts and grows to meet the needs of the 21st-century electricity system. The Federal Government has an interest in the development of this workforce. Recommendations include the following:

- Support cyber-physical systems curriculum, training, and education for grid modernization and cybersecurity
- Support Federal and regional approaches to electricity-workforce development and transition assistance.

**Meet Federal Commitments to Communities Affected by the Transformation of the Electricity Sector.** To achieve the transition to the electricity sector of the 21st century smoothly, quickly, and fairly, the Federal Government should offer a synthesized package of incentives that addresses the needs of the most important stakeholders both within and outside of the electricity sector. Many of these needs are addressed through other recommendations on this list, including incentives to reduce the cost of flexible and clean assets, encourage the deployment of new and improved technologies throughout the electricity supply chain, and train workers for 21st-century electricity jobs. Recognizing that the shift to the 21st-century electricity system can impact communities dependent on 20th-century resources, the following recommendations provide transition assistance for communities affected by the multi-decadal decline in coal production. Recommendations include the following:

- Meet the Federal commitment to appropriate sufficient funding to accomplish the mission of the Abandoned Mine Lands Fund.

## Enhancing Electricity Integration in North America

**Increase North American Cooperation on Electric Grid and Clean Energy Issues.** Electric reliability cooperation is needed to strengthen the security and resilience of an increasingly integrated cross-border electricity grid. A clear understanding of the regulatory requirements at the Federal and state levels for the permitting of cross-border transmission facilities, sharing of best practices, and exploration of potential future cooperation on grid security issues will limit uncertainties and improve policy coordination at the multilateral and international levels. Recommendations include the following:

- Increase U.S. and Mexican cooperation on reliability
- Advance North American grid security
- Modernize international cross-border transmission permitting processes.

Mr. PALLONE. Thank you, Dr. Moniz.
Next, we have Dr. Frieden, who is recognized for 5 minutes.

**STATEMENT OF TOM FRIEDEN, M.D.**

Dr. FRIEDEN. Good morning. Thank you so much, Chairman Pallone, Ranking Member Rodgers, distinguished members of the committee. My group, Resolve to Save Lives, partners with countries to prevent 100 million deaths from heart disease and stroke and to make the world safer from epidemics.

It has been more than a century since there has been a pandemic this disruptive, and we have to always remember that every case, hospitalization, and death represents a mother, a father, a neighbor, a colleague, or friend. And it has been unprecedented, but there is really room for optimism. The situation is much better than it was weeks ago. We are vaccinating more than 2 million people a day, and deaths are steadily decreasing as a result, but better doesn't mean good. Case numbers are still high. Declines have stalled or are even increasing in some areas of the country, and the emergence and spread of variant viruses is the wild card and single greatest concern about response to the pandemic. Accelerating vaccinations and other control measures as quickly as possible is the best way to save lives and decrease the risk of dangerous variants.

Now, here is the bottom line in terms of our health, and I can talk to that specifically: We have to fix our broken primary healthcare system. I won't talk more about that in this testimony. We have to fix our broken public health system, and we have to make the world safer because, if people are stronger there, we are safer here, safer from epidemics.

And the plain truth is we haven't adequately invested in public health. We spend $11,000 per person on healthcare, but 40—4–0—times less, less than $300 per person, for public health. We are underfunded, understaffed, poorly coordinated, and not equipped for modern-day crises. And the result was avoidable illness and death with the pandemic.

Now, we can do five things to make a difference. Sorry, six things.

First, long-term investments. It is very important that you have made a down payment, but a sustainable system cannot rely on one-time funding. It is inevitable there will be future outbreaks. What is not inevitable is that we will continue to be so underprepared. One-time supplemental doesn't answer the question. We need an ongoing support.

Second, use a cross-cutting support. The Centers for Disease Control has more than 160 budget lines. The solution isn't to cut or merge or block-grant those lines. The solution is to come up with new lines that are cross cutting that meet the needs at the local level, State level, city level, and global level.

Fourth, strengthen local and State health agencies so they can rapidly respond to outbreaks.

Fifth, address the chasms between Federal and State and, in most States, State and local public health agencies. That will mean greatly expanding CDC programs that embed staff for 2 to 5 years or longer in State, city, and local and global public health depart-

ments. That is how we move toward a more unified, effective, efficient system that we should all support.

And, sixth, strengthen global health security. Disease spread anywhere is a risk everywhere.

Last year, I testified about new ways to ensure sustained public health financing. We cannot build sustained infrastructure if our health defense agencies, including CDC, HRSA and others, have to compete with very laudable and important funding priorities: Head Start, research at NIH, and many, many more. We proposed a sustainable funding mechanism for public health infrastructure that would fund lines that are essential for preventing, detecting, and responding to health threats. We call this the Health Defense Operations Budget Designation, or HDO. It would exempt specific congressionally designated health security infrastructure funding from the annual 302 spending caps. You decide in Congress what those lines are. This would not be a fund. Congress would maintain oversight on all programs, projects, and activities that you in Congress designate as essential to secure our health security. And you can mandate an OMB bypass professional judgment budget so that you can know the unvarnished truth about what is needed to provide sustained and sustainable funding so we can escape this terrible and deadly cycle of panic and neglect, because that is what we are in now.

The HDO proposal has strong bipartisan support. Forty-nine leading public health groups have signed on, and I hope that no matter how divided groups are politically, we recognize that we share a common enemy. That enemy is dangerous microbes. We need a sustainable public health infrastructure to defend our country, our people, from health threats, just as we depend on the military to defend us from threats foreign and domestic. We can prevent the next pandemic. This is the moment to do it. Thank you very much.

[The prepared statement of Dr. Frieden follows:]

**Testimony of Dr. Tom Frieden, President and Chief Executive Officer of Resolve to Save Lives, an initiative of Vital Strategies**

Good morning. I thank Chairman Pallone, Ranking Member Rodgers, and distinguished members of the Committee for the opportunity to testify today. I'm Dr. Tom Frieden. I was CDC Director from 2009 to 2017 and New York City Health Commissioner from 2002 until my appointment to lead the CDC. I received my MD and MPH degrees from Columbia University, with advanced training in internal medicine, infectious disease, public health, and epidemiology. I am President and CEO of Resolve to Save Lives, an initiative of global public health organization Vital Strategies, and Senior Fellow for Global Health at the Council on Foreign Relations. Resolve to Save Lives partners with countries to prevent 100 million deaths from heart disease and stroke and to make the world safer from epidemics.

It has been more than a century since there has been a pandemic this disruptive. The toll on human lives and livelihoods has been shocking. Families and communities have experienced tremendous loss. Health care workers and public health professionals have died in the line of duty. Parents are have had to make the tough decision of whether to work or assist in their child's remote education for much of the year. Every statistic we see, whether a case, hospitalization, or one of the more than 535,000 reported deaths from COVID-19 in the U.S. represents a mother, father, neighbor, colleague, or friend. We must work together to reduce the toll of this pandemic and do everything in our power to make sure nothing like this ever happens again.

In January 2020, Resolve to Save Lives pivoted to working on COVID-19. We offered to assist any government in any part of the world fighting the pandemic. We advise organizations, governments, health systems, doctors, nurses, and other health care workers. We partner with more than 60 countries, learning from and with them and sharing lessons from the front lines of this pandemic. Among other efforts, we support:

- Rapid response funds;
- Protection of health care workers; and
- Tracking and improving systems to improve the ability of communities, health care systems, and countries to base actions on data, including laboratory networks, disease monitoring programs, survey, mobility, and mortality data; and
- Global initiatives, including partnerships with development banks and international organizations.

We have published more than 100 articles, as well as detailed, practical guidance on the pandemic. We post a weekly summary of important new and emerging scientific evidence, and we advance core concepts: Adaptive Response, recognizing that there will be different approaches to reducing COVID-19 infections that fit best at different times and in different areas; the Box-It-In approach—to test, isolate infected people, warn, and quarantine people who have come in contact with infected people, thereby reducing spread so we can resume activities

as soon and safely as possible; Advancing Equity—providing disproportionately high levels of services and resources to communities disproportionately affected; and Finding the Balance—recognizing that the way forward is to control the virus and protect livelihoods.

This has been an unprecedented pandemic, but there is room for cautious optimism. After a slow and somewhat confusing start, the United States is now vaccinating more than 2 million people a day with safe and highly effective vaccines. We have already seen steep reductions in deaths in the long-term care population, where vaccinations were initially prioritized. Targeted vaccination is driving down deaths, even though it is still not making a major impact on case rates, especially in the context of more dangerous variants spreading. The situation around the country is looking significantly better than it was a few weeks ago, but we are not yet where we need to be, declines have stalled or even begun to reverse in many parts of the country, and variants are a major risk. Better does not mean good—even at the reduced case numbers we're seeing today, we're still seeing a higher caseload than the low point before the third surge of cases started in early fall.

Emergence and spread of variants is the wild card and single greatest concern for the future of this pandemic. We don't yet know how bad variants will be, but accelerating vaccinations and other control measures as quickly as possible both in the United States and globally will help. I'm optimistic about our future, but even once we've defeated this virus and this pandemic, we must work to prevent the next one—and to do that we have to understand how we got here.

To prevent the next pandemic, it's necessary to address some hard facts and plain truths about our country's public health infrastructure. As COVID-19 spread through the country a year ago, we saw the devastating result of decades of underinvestment. Our nation had a patchwork of underfunded, understaffed, poorly coordinated health departments and decades out-of-date data systems—none of which were equipped to handle a modern-day public health crisis.

As a nation we have not adequately invested in public health. The United States spent more than $11,000 per person on health care in 2018, but 40, that's Four-Zero times less, just $286—for public health. Our local public health departments, those on the front lines of this pandemic, often providing support for rural and vulnerable populations, lost 50,000 jobs between 2008 and 2017 due to funding cuts.

In 2015, after the Ebola outbreak in West Africa, Congress wisely made an initial investment in Global Health Security efforts to strengthen the world's ability to prevent, detect, and respond to infectious disease threats. CDC positioned new staff in more than 49 different countries to strengthen health systems so that they would be better prepared to prevent, detect, and respond to health threats. However, by the end of 2018, the original supplemental funding ran dry, and CDC was forced to abandon its investment and assistance in more than 30 countries. By not providing sustained funding, the CDC lost eyes and ears on the ground to watch for the next emerging infectious disease. In fact, it was reported that because of these cuts and other factors, CDC reduced its footprint in China CDC from 47 to 14 staff, including reducing key

epidemiologists.[1] We won't ever know for sure if a stronger U.S. CDC presence in China would have changed the trajectory of the COVID-19 pandemic or given us a clearer and more accurate early warning of what was to come, but that is certainly possible.

What we do know is that the combination of a lack of federal leadership and chronically underfunded public health infrastructure both domestically and globally led to the catastrophic failure of our public health systems at all levels. This contributed to the United States experiencing one of the highest per-capita mortality rates in the world, nearly double that of Germany, nearly triple that of Canada, and more than ten times that of Norway and Finland, to give just a few examples.

We can't bring back the lives lost. What we can do is make sure a preventable catastrophe on this scale cannot happen again. Now is the time to build the sustainable public health infrastructure we need to prevent, detect, and respond to the next pandemic – a pandemic that could happen 10 years from now, or 10 days from now – the microbes won't wait. How do we do this?

First, make long-term investments. Congress has already taken significant steps to build the public health infrastructure we need by making investments in the previous COVID-19 relief bills. Investments for public health workforce, laboratory capacity, genomic sequencing, data modernization and forecasting, and global health are a great start. However, to build a sustainable system we cannot rely on supplemental or one-time funding. We can only ensure our national health security and avoid squandering the strategic supplemental funding once we pair our public health investments with sufficient and sustained annual funding to maintain these programs. Put simply, public health cannot build a reliable and resilient infrastructure, hire quality staff, and make effective contracts with short-term one-time funding.

Second, build the infrastructure our country needs with a cross-cutting approach, at all levels: community, city, state, federal, and global. CDC has more than 160 different budget lines. While I was NYC Health Commissioner, I had access to 20 times the amount flexible funding I had while I was CDC director. The solution is not to cut or merge these more than 160 lines, but to leave them in place and create additional lines that are cross-cutting and support local, city, state, and global action to protect health. This is funding that is crucial to address urgent and cross-cutting health needs.

Third, build our national public health data infrastructure. I want to be frank and direct: this will be a long, difficult, and expensive process. Anyone who tells you there are quick fixes, even with modern technology tools, doesn't understand the complexity of the challenge. These investments are decades overdue. The U.S. public health informatics infrastructure must be dramatically strengthened to make real-time, accurate, consistently presented information available from national, state, and local public health departments, with inputs from laboratories and health care providers. Lack of accurate, real-time information was one of the greatest failures of the U.S. response to the COVID-19 pandemic.

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[1] https://www.reuters.com/article/us-health-coronavirus-china-cdc-exclusiv/exclusive-u-s-slashed-cdc-staff-inside-china-prior-to-coronavirus-outbreak-idUSKBN21C3N5

The elements are in place for a transformational, nationwide approach to public health informatics with data from all providers and reporting and public dissemination at local, state, and national levels. This will require full protection of privacy within the authorities granted to public health. To achieve this goal, it will be necessary to attract data-driven and tech-savvy public health workers, something which will also create good jobs. This investment—unlike past efforts—must be implemented with modern, agile informatics approaches. Federal funding for state and local public health must be predictable and sustained and should offer local and state health departments a common platform and the flexibility to strengthen the information infrastructure for evidence-based improvements in programs and policies.

What would a modern public health informatics infrastructure do for us? We would have access to electronic lab reporting and electronic case reporting (eCR). eCRs would need to include case investigation data, contact tracing, and follow up, and health information exchange (HIE) for enrichment of contact information—all while strictly maintaining confidentiality and protecting privacy. This new architecture would incorporate syndromic surveillance from health care providers and hospital networks to detect unusual spikes in provider or health care utilization and provide an early warning of outbreaks. A modern system will require the inclusion of standardized national electronic death reporting system. Furthermore, non-identifiable data will need to be accessible via an easy-to-use dashboard for analytics and reporting.

The bridge between a health care provider and all this data will often be a laboratory, and in many cases, a public health lab. As a nation we must have a strong public health laboratory infrastructure able to rapidly detect a range of biothreats from COVID-19 to anthrax. Combined with a modern data infrastructure, critical lab results will be accessible to health care providers and patients in minutes instead of days.

Fourth, strengthen the ability of state and local health agencies to quickly detect and respond to infectious disease outbreaks. This will require a strong infrastructure in place *before* the outbreak happens. Local health departments were decimated by budget cuts prior to the pandemic and the uneven response from state to state was the result. These professionals, many of whom faced a barrage of criticism and even some death threats, have been fighting this pandemic in the community. Our health departments, the front lines of our health defense, must be able to respond quickly to all outbreaks and the vast number of other public health issues that face our communities, including COVID-19, influenza, antibiotic-resistant bacteria, and more. To accomplish this, they require increased resources for flexible needs, but resources should be paired with technical support and capacity building from the CDC. Saying this will not make me popular with my friends in public health, but all too often, funds disbursed to state health departments are not distributed efficiently and effectively, and not sufficiently targeted to the areas most in need of assistance, particularly vulnerable populations, and rural communities. Accountability mechanisms, but not bureaucratic red tape, will be important to ensure new resources are spent in a timely and equitable manner. One good model is the Public Health Emergency Preparedness program, which requires concurrence from local governments to the state application. Direct CDC funding to cities in another excellent way to get resources to where they are likely to be used more effectively.

Fifth, we must address the chasms between federal and state and, in most states, between state and local public health agencies. A greatly expanded CDC program to embed thousands of epidemiologists and public health implementation specialists in state, city, and local public health departments, with regular rotation of staff back to the Atlanta, Georgia, headquarters after two to five years would help build a common culture and forge a way forward to take practical action to confront the full range of health threats facing the country. These embedded specialists and experts should focus on reducing preventable illness, injury, and death, especially in underserved and Black, Latinx, and Native American/American Indian communities.

Sixth, strengthen global health security, because it is essential to protecting the United States from health threats. The simple truth is that in our increasingly interconnected world, disease spread anywhere is a risk everywhere. If the world is safer, we will be safer here at home. Throughout this pandemic and other infectious disease events, we have seen unfortunate examples of failures of global cooperation which hasten the spread of infectious diseases. By working together—sharing data, knowledge, and resources—we can increase our safety and security. Furthermore, advances in biological science have made it increasingly easy to create dangerous pathogens. The intentional or unintentional release of a biological agent could be as deadly as a nuclear war, and we need a similarly vigorous systems of standards and inspections to reduce that horrifying risk. Ensuring that more countries have the basic capacities to prevent, detect, and respond to outbreaks, as CDC had been doing prior to its retreat because it lacked a sustained funding source, will be essential to improve domestic health security.

Seventh, commit to making sure this never happens again. It is inevitable that there will be future outbreaks. What's not inevitable is that we continue to be so underprepared. I'm encouraged that Congress and the Administration quickly worked to pass several comprehensive COVID-19 relief bills as well as the recent American Relief Plan, all of which provide billions of dollars in supplemental funding for COVID-19 response efforts, and some new one-time investments in public health genomics, data, and global health. These are vital for now and a start in building some of the systems we will need for the future. However, one-time supplemental funding is a temporary fix. Without sustained support, our health will be avoidably at risk. Without stable funding, it is impossible to hire and retain top staff, hold funded organizations and contractors to full accountability, and be effective partners with countries and organizations. As our experience with this pandemic has shown, being prepared is far cheaper and costs our economy far less than when we are unprepared. Good public health is good business and good governance.

You have a unique opportunity to protect Americans from future pandemics by ensuring that the investments made in public health infrastructure do not get built only to crumble a few years later. If you take strategic action now, you can protect our country from the next microbial sneak attack. If we as a society fail to do this, we will remain unprepared both domestically and abroad, shortchanging our health and economic security and costing American lives.

Last year, I testified before many of your colleagues and said it was time to consider new ways to ensure sustained public health financing to protect our health security once these supplemental funds dry up. After watching the Prevention and Public Health Fund be cut by both Republicans and Democrats – money, after all, is fungible – it was clear to me that a steady base appropriation had to be achieved. However, programs in public health, primarily those in CDC,

ASPR, and HRSA, must compete for funding with thousands of laudable and important priorities in the Labor Health and Human Services Appropriations bill. How can we build a sustainable public health infrastructure base if CDC, our health defense agency, is competing with Head Start or NIH for scarce resources?

Future health and economic security can best be protected by changing the way we allocate funds that protect us from health threats. We have seen the limitations that annual spending caps and sequestrations have caused for discretionary funding. And we have seen, with the Prevention and Public Health Fund for example, that even mandatory funding does not ensure stable support. We propose a new funding mechanism for programs essential to our public health infrastructure: Those that prevent, detect, and respond to health threats. We call this the Health Defense Operations (HDO) budget designation, and it would exempt specific, Congressionally designated health security infrastructure funding from the annual 302(a) spending caps and any future sequestration so that our public health infrastructure will be sustained once the initial funding expires. The HDO would create an off-ramp to sustainable, sufficient funding so we do not find ourselves back in the cycle of panic and neglect, panic.

As you may know, the Overseas Contingency Operations (OCO) designation was created as an off-ramp for our armed forces after Congress passed large supplemental appropriations in response to the 9/11 attacks. It became clear that the Department of Defense would require sustained resources to maintain our national security. Similarly, a Health Defense Operations designation would ensure that our nation's health security is defended through sustained and adequate funding for our public health defense. However, learning from experience with the OCO, the HDO will provide strong safeguards and accountability to ensure appropriate oversight for appropriators, including funding for specific budget lines rather than whole agencies, with Congressional oversight of the spending and progress.

Throughout multiple administrations, political and budget pressures have dictated funding reductions or stagnation of core public health programs. This must end. HDO programs should be required to submit a bypass professional judgment budget to Congress annually so that Congress has an unvarnished view of what is really needed to protect Americans. The NIH submits three bypass budgets to Congress every year that explain the true resource needs for cancer, HIV/AIDS, and Alzheimer's research. Likewise, Congress and the American people must understand exactly what is needed for our public health defense so that Congress can then provide the resources required to sustain the public health infrastructure we need to keep us safe and healthy. This way, we can ensure that the public health investments contemplated today will be sustained so we are prepared for the next pandemic. This proposal has strong bipartisan support, and 49 different leading public health groups have signed on to it.

No matter how divided we may be politically, we share a common enemy—dangerous microbes. We lost more lives in this pandemic than in WWII, Korea, Vietnam, and 9/11 combined. We need a sustainable public health infrastructure that our nation can depend on to defend us from health threats, as we depend on our military to defend us from threats foreign and domestic. We can prevent the next pandemic. This is the moment. Thank you.

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https://www.wsj.com/articles/will-we-be-ready-for-the-next-pandemic-11613145677

THE SATURDAY ESSAY

# Will We Be Ready for the Next Pandemic?

**The world must move urgently in 2021 to develop strategies and systems for fighting diseases that could be even deadlier than Covid-19**

*By Tom Frieden*
Feb. 12, 2021 11:01 am ET

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Fast forward to 2023. The Covid-19 pandemic is largely behind us. Most of the world has been vaccinated, though we have to tamp down occasional flare-ups and people sometimes still wear masks. While we mourn the millions who died, we have entered a post-pandemic world in which most things are more or less as they were before Covid-19. Travel and trade are unrestricted; everything from dinner parties and big weddings to stadium concerts and megachurch services are being held again; and economies are booming to keep pace with pent-up demand.

Then, just as suddenly as Covid-19 emerged, disease detectives discover a fresh cluster of a new, pneumonia-like illness. Testing quickly confirms that it isn't a variant of Covid-19 but a new influenza virus that jumped—somehow, somewhere—from birds to humans. The new virus is as infectious as the one that caused Covid-19 but four times as deadly. And unlike Covid-19, but like the devastating 1918 influenza pandemic, the new virus is particularly deadly to young adults—and, in this case, also to children.

A horrifying influenza pandemic isn't the only nightmare scenario that could be worse than Covid-19. Think of the hundreds of thousands of cases of tick-borne Lyme disease in the U.S. each year. In other parts of the world, some ticks spread Ebola-like illnesses, and if these infections spread to the U.S., tick-bites could also lead to a disease with the terrifying lethality of Ebola. Or a highly drug-resistant bacterium could spread rapidly. Or a laboratory could develop an untreatable, vaccine-defying strain of a virus or bacterium and—intentionally or by accident—release it into the world.

The world wasn't ready for Covid-19. Will we be ready for the next, inevitable pandemic?

To prepare, we must start by understanding that the lessons from battling Covid-19 aren't just about Covid-19. We will fail if we learn nothing more than how to fight the last war better. Now is the time to get ready and to realize that the costs of preparedness will be dwarfed by the price of disaster. Here are six urgent steps the world must take to become far more pandemic-proof.

### 1. Set a new goal for early warning and response: 7-1-7.

We will have to respond rapidly to any potentially major new health threat. I suggest a goal of "7-1-7": Every country should be able to identify any new suspected outbreak within seven days of emergence, start to investigate the event within one day and report it then, and mount an effective response—defined by clear, specific benchmarks for different pathogens—within seven days.

These goals will help governments focus attention and resources. Part of the reluctance to fund health preparedness has been a lack of simple measurements of progress. One reason for the broad bipartisan support for the global battles against HIV and malaria has been the appeal, to American politicians and voters alike, of clear metrics: the numbers of people treated, bed-nets distributed, lives saved. For HIV, the goal has been what the U.N. calls "90-90-90"—ensuring that 90% of people infected with HIV know their status, getting sustained treatment to 90% of those diagnosed and suppressing the viral load of 90% of the people on treatment. This strategy has turned concrete, lifesaving outcomes into targets for global action. Meeting the 7-1-7 goal, or something like it, is essential to a safer planet, but it won't be easy. It will require several other steps.

### 2. Bolster the capacity of countries to prepare and respond.

The Centers for Disease Control and Prevention (CDC) have learned a crucial lesson over the past two decades: The best emergency responses use everyday systems that are robust enough to scale up in an emergency. Yet efforts to strengthen such systems are often unfocused. Enhancing countries' capacities will require substantial resources, robust technical assistance and an insistence on accountability.

As noted in a recent study by the Institute for Health Metrics and Evaluation, a global-health research group at the University of Washington School of Medicine, annual funding for global health in

2019 was an estimated $41 billion (less than 20% of which came from the U.S.). Of that total, the group estimated that less than 1% was for pandemic preparedness—some $374 million.

Credible estimates of the amount needed to boost preparedness (beyond current investments) in low- and middle-income countries start at $5 to 10 billion a year for the next two or three years, continuing for at least a decade. This would come in addition to funding for better research, primary healthcare and other steps essential for progress. This is serious money, but it is dwarfed by the costs of an out-of-control pandemic, as we have all painfully learned.




The World Health Organization's Geneva headquarters, April 24, 2020.
PHOTO: FABRICE COFFRINI/AFP/GETTY IMAGES

Many countries will need technical assistance, which can be provided in part by the World Health Organization and its networks, as well as by the U.S. CDC. Such efforts could be complemented by additional regional public-health organizations. For instance, during the Covid-19 crisis, the newly created Africa Centres for Disease Control and Prevention (a public-health agency of the African Union officially launched in 2017) has supported stronger disease-tracking and response systems, as well as a rapid expansion of sorely needed laboratory services on the continent. The European Union announced late last year a 20-fold increase in funding for the European Centre for Disease Prevention and Control (founded in 2004), and discussions are under way about creating similar regional disease-control centers in Southeast Asia and the Middle East.

Stronger bilateral programs from the U.S., the U.K. and other wealthy countries can also help. China would be likely to follow suit and increase its own global public-health engagement. Structured well, this could be an area for U.S.-Chinese collaboration.

As recent studies in the Lancet and other medical journals have noted, the Covid-19 pandemic has underscored the central importance of primary care. New infectious diseases will be able to spread widely

until patients can afford to go to health centers as soon as they feel ill, clinicians are trained to diagnose and report patients with unusual conditions, and health centers can provide accessible treatments and vaccinations. Most countries haven't invested remotely enough in primary care—including the U.S., which performs abysmally on core measures of primary-care quality. This is a major reason for the rocky U.S. rollout of Covid-19 vaccinations.

But even with more money and better technical assistance, the world won't be able to meet the 7-1-7 goal unless it is organized for success.

### 3. Let global institutions focus on what they do best.

As the lead U.N. agency for global public health, the WHO remains the indispensable anchor of such efforts. The organization has obvious limitations: It has often been underfunded, underpowered and reluctant to criticize governments. But it performs several indispensable roles: providing evidence-based public-health guidance, facilitating international collaboration, openly tracking data and helping countries to strengthen their public-health efforts.

The WHO needs real reforms to meet its mission. It must be much better insulated from political and geographic considerations in the hiring and promotion of staff, as well as in its assessments of countries and recommendations to them. A stronger WHO could provide robust technical support to governments world-wide, especially through its proposed Global Strategic Preparedness Network.

As the world faces 21st-century pandemics, its international public-health structures still come largely from post-World War II agreements, with newer entities often grafted awkwardly onto them. The WHO was central to global health during the Cold War era, with a prominent role for the U.S. CDC too, but new entities—including new national and regional CDCs based on the U.S. model—have reshaped the landscape of global health.




Community health workers supported by the Global Fund and other groups gather outside a local health facility, Homa Bay County, Kenya, May 2020.

PHOTO: AMREF HEALTH AFRICA/KENNEDY MUSYOKA

The two largest new public-health groups—the Global Fund to Fight AIDS, Tuberculosis and Malaria and Gavi, the Vaccine Alliance—have a combined budget that is about twice that of the WHO. Some new philanthropies, particularly the Bill & Melinda Gates Foundation and the Wellcome Trust, are also large and influential.

The Global Fund is a major financier of programs to combat the three diseases in its title, while Gavi helps to negotiate and finance vaccines for lower-income countries. Both are international organizations that aren't part of the U.N. and aren't under WHO control. They receive their substantial resources from country governments, which have steadily increased their investments in the Global Fund and Gavi because of their efficiency, accountability and impressive results. But both entities were created without strong technical components (in large part to avoid alienating the WHO), and the WHO hasn't been able to provide sufficient specialized expertise to ensure that Global Fund and Gavi programs reach their potential.



A nurse midwife prepares a vaccine shot in an immunization program supported by Gavi, the Vaccine Alliance, in the village of Purani Panapur, India, 2013.

PHOTO: GAVI/2013/MANPREET ROMANA

These new entities have brought far more resources, energy and accountability into global health, but they haven't substantially strengthened laboratory capacity, disease monitoring, primary care and other capacities essential to beating Covid-19 and future pandemics.

### 4. Get buy-in from wealthier countries and major philanthropies.

By working together to strengthen early-warning systems, share data, improve rapid-response capacities and strengthen health-protection systems world-wide, we can save millions of lives and trillions of dollars. This will cost billions a year, spent by countries large and small, but that pales in comparison to the International Monetary Fund's October 2020 estimate that Covid-19 has cost the world some $20 trillion. The next pandemic could be even deadlier—and costlier.

The world needs new financial mechanisms for readiness that can administer funds efficiently, offering accountability and boosting confidence for government investments. The World Bank, the African Development Bank, the Asian Development Bank and other entities can play important roles. Most important, the Global Fund could both generate and disburse funds for national preparedness. It could offer not just money but specific benchmarks toward the 7-1-7 goal and a new, pandemic-specific structure for ownership and oversight in recipient countries, involving ministries of finance, health, agriculture and more, as well as the private sector and civil-society groups.

### 5. Persuade the world to respond globally and address dangerous gaps.

"An eye for an eye leaves the whole world blind," as the old saying goes. Today, failures of global cooperation worsen the spread of infectious diseases by leaving the world blind to emerging threats. But by working together—by sharing data, knowledge and resources—we can increase our shared safety and security.

One neglected issue is improving laboratory safety. Some lab errors are inevitable, but we have insufficient global standards—and no global oversight—to reduce the risk of unintentional release of deadly pathogens, as may have occurred with influenza from an accidental laboratory release in the former Soviet Union in the late 1970s and is documented to have occurred with smallpox in the U.K. in 1978 and with SARS in China in 2004.

Release of a biological agent could be as deadly as a nuclear war, and we

need similarly vigorous systems of standards and inspections to reduce that horrifying risk. Advances in biological science have made it increasingly easy to create dangerous pathogens. A global compact to limit the number of laboratories, personnel and experiments and to more safely manage them could substantially reduce the risk. Even reaching this modest goal would be difficult: It would be expensive, require global agreement, face resistance by researchers, demand inspections and still fail to eliminate the risk of bad actors. But we urgently need it nonetheless.

We must also reduce the risk of diseases spreading from animal populations to humanity. Most dangerous new pathogens emerge from human contact with animals, often because of our encroachment into traditional habitats. A global, enforceable compact, as proposed by Vanda Felbab-Brown of the Brookings Institution and others, would help to end the commercial sale of wild animals for food. In parts of Africa and Asia where bush meat is important to nutrition, we will also need economic measures that make it easier to substitute other locally available sources of protein, and much stronger programs are needed to reduce the risk of influenza spreading from birds and swine to people.

SHARE YOUR THOUGHTS

*What's the biggest lesson you think public officials should draw from the pandemic? Join the conversation below.*

Finally, the world must increase its manufacturing capacity for diagnostics, treatments and vaccines. Pathogens spread, so we cannot leave millions without access to the top-quality diagnosis, treatment and vaccines we want for ourselves. The Rand Corp. has warned of the dangers of "vaccine nationalism," in which "countries push to get first access to a supply of vaccines, potentially hoarding key components for vaccine production."

Such short-sighted behavior is both ethically indefensible and politically inevitable. One solution would be to increase manufacturing by countries with relatively small populations, which would be able to vaccinate their own populations without having much impact on the overall supply. The world could also work to boost manufacturing capacity through companies that accept global financing in exchange for their agreement to produce reasonably priced products that meet stringent standards and to distribute them in underserved regions.

Exciting new technologies such as mRNA—which made possible the first two Covid-19 vaccines licensed in the U.S.—raise the promise of platforms that can be rapidly repurposed to tackle new threats.

Globally supported mRNA production facilities could help end the current pandemic and, potentially, produce lifesaving vaccines and medicines that would create a sustainable business model, with sales to public and private purchasers between pandemics.

But more than all this, we need a new global attitude.

### 6. Don't wait.

We must act now: 2021 is the now-or-never moment to improve global resilience in facing future pandemics. We can't know the character or the timing of the threats ahead, but they are inevitable. There is no time to lose in making preparations.

Public-health decisions are unavoidably political. Failing to act, in the face of Covid-19's proof that the world is dangerously vulnerable, would also be a decision. This year, when the urgency of such work is so clear, we must make significant investments to protect and expand global health—or we and our children will face the dire consequences.

*—Dr. Frieden was the director of the Centers for Disease Control and Prevention from 2009 to 2017. He is the president and CEO of Resolve to Save Lives, an initiative of the public-health organization Vital Strategies, and a senior fellow at the Council on Foreign Relations.*

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LIFE & ARTS | IDEAS | ESSAY

# Which Countries Have Responded Best to Covid-19?

The world should learn from the most successful strategies for testing, quarantine, public communication and economic support.




A medical worker performs a temperature check in Seoul, South Korea, May 2020.

PHOTO: SEONGJOON CHO/BLOOMBERG NEWS

*By Tom Frieden*
Jan. 1, 2021 11:00 am ET

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8 minutes

It has been a year since Covid-19 began to spread. Which countries did the best job of responding to the pandemic in 2020, and what can we learn from them?

A successful response to Covid-19 turned out to depend on more than a country's wealth, scientific prowess and history of public health successes. The U.S. enjoys all of these advantages but mounted one of the worst responses to the pandemic: 1 in every 990 Americans has died from Covid-19 since the pandemic began. Bad politics, quite simply, can trump good public health.

Other developed countries that did well initially, such as Canada and some European nations, have faltered during the second or third surge

of infections, because their governments and people grew tired of implementing effective strategies. In many Asian countries, it has long been common for people to wear masks when feeling ill, so they adopted masks early and widely.

**Best at early action: Taiwan**

*1 reported Covid-19 death per 3,366,140 people*

The world's first awareness of Covid-19 came from cases among travelers arriving in Taiwan from Wuhan, China. The country quickly halted flights from much of China, quarantined travelers from other areas, stopped cruise ships from docking, implemented widespread testing and quadrupled production of face masks within a month.

Taiwan also provided intensive support, including stipends, to patients with Covid-19 and people with whom they had come into contact, helping to increase adherence to public health recommendations. These early actions were pivotal in keeping Taiwan to under 800 cases all year, while avoiding lockdowns. The U.S. now has more cases and deaths every 5 minutes than Taiwan has had all year.

**Best at learning from recent epidemics: Liberia**

*1 reported Covid-19 death per 55,040 people*



Men was their hands at a checkpoint outside Monrovia, Liberia, April 2020.
PHOTO: AHMED JALLANZO/EPA-EFE/SHUTTERSTOCK

Liberia, hard hit by the Ebola epidemic in 2014, was one of the first countries to start screening for Covid-19 at airports and to adopt other control measures, such as rapid testing, complete contact tracing and quarantine. Many other countries in Africa, including Senegal and Uganda, also used their experiences from past disease outbreaks to implement swift, expert, comprehensive responses.

**Best at crushing the curve: New Zealand**

*1 reported Covid-19 death per 204,360 people*

Like Taiwan, New Zealand is an island, which makes it far easier to enforce travel bans. Initial models showed that community spread of Covid-19 in New Zealand could potentially overwhelm the health care system. The country began implementing its pandemic influenza plan in February, including preparing hospitals and instituting border control policies. Because New Zealand lacked sufficient testing and contact tracing capacity, national leadership implemented a countrywide lockdown in late March with the goal of eliminating Covid-19 entirely.

By June, the pandemic was declared over in New Zealand, with the country reporting one of the lowest coronavirus-related mortality rates among all 37 OECD nations. Later cases were all from international travelers, who were kept in isolation for two weeks post-arrival, and not from community spread.

Prime Minister Jacinda Arden has exemplified empathetic, clear communication, which greatly increased New Zealanders' willingness to cooperate and was essential to the country's success.

**American Samoa remains the only territory in the U.S. without any Covid-19 cases, in part because health authorities were already on high alert.**

**Best location in the U.S.: American Samoa**

*Deaths from Covid-19: Zero*

American Samoa remains the only territory in the U.S. without any Covid-19 cases, in part because health authorities were already on high alert following a measles outbreak in late 2019. In an effort to stave off the virus early, the territory of 55,000 people halted all incoming passenger flights. As a result of this near-total isolation, American Samoa has not had to implement widespread closures, distancing or testing. Similar actions 100 years ago allowed the territory to avoid any deaths from the 1918 influenza pandemic.

**Best at testing: South Korea**

*1 reported Covid-19 death per 63,290 people*

When it became clear that people without symptoms could spread Covid-19, South Korea tested early and aggressively, conducting more than twice as many tests per capita as other countries in the pandemic's first weeks. Along with other measures, including extensive and highly effective contact tracing and quarantine, this kept cases from increasing rapidly.

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**Best at quarantining: Hong Kong**

*1 reported Covid-19 death per 54,810 people*

Hong Kong has one of the highest population densities in the world, yet it kept cases low by establishing mandatory isolation protocols and quarantine centers for people with Covid-19 and those who came in close contact with them.

**Best economic protection: Denmark**

*1 reported Covid-19 death per 4,970 people*

Some countries excelled at protecting people economically and socially. In Denmark, the government has covered a portion of employees' salaries in private companies to avoid large-scale layoffs. Notable mentions go to India, the European Union and Australia, which quickly provided income supplements to lower-income people using electronic cash transfers. Colombia went out of its way to protect vulnerable Venezuelan migrants, who weren't eligible for cash transfers, by establishing shelters and food centers.

**Best at public communication: Finland**

*1 reported Covid-19 death per 10,510 people*

A few countries have fought rumors and distrust by sharing information with the public widely and openly. Finland, helped by its high media literacy, was able to build on a 2014 initiative that educated people about how to counter false information. One Finnish project partners with social-media influencers to spread accurate information

on digital platforms.

**The countries that performed best have learned from their mistakes and used data to continuously improve.**

South Africa has also excelled at clear communication, including strategic use of an alert-level system that empowers people to understand their risk and helps the government make transparent and balanced decisions about closures. Germany's leaders have also been models of clarity and effective communication, with Chancellor Angela Merkel calling for citizens to exhibit "patience, discipline and solidarity"—three essential aspects of an effective pandemic response.

Most people, including many health professionals, never imagined the toll that Covid-19 would take. The countries that performed best have learned from their mistakes and used data to continuously improve public health, primary care, emergency response and health communication. Even as we begin to roll out vaccines, we need to keep learning from experience what works in fighting Covid-19.

This isn't the last disease threat our world will face, and the past year has shown that we are all connected: Until every country is safer, all of us are at risk. When the next pandemic strikes, the whole world needs to implement best practices to save lives and protect livelihoods. Now is our opportunity to improve global preparedness; if we don't apply the lessons of 2020 in 2021, we never will.

*—Dr. Frieden was the director of the Centers for Disease Control and Prevention from 2009 to 2017. He is the president and CEO of Resolve to Save Lives, an initiative of the public-health organization Vital Strategies, and a senior fellow at the Council on Foreign Relations.*

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Mr. PALLONE. Thank you. Thank you, Dr. Frieden.
Next, we have Mr. O'Rielly. He is recognized for 5 minutes.

**STATEMENT OF MICHAEL P. O'RIELLY**

Mr. O'RIELLY. Members of the committee, thank you for inviting me to share my views on the communications portions of H.R. 1848, the LIFT America Act, and efforts to expand broadband deployment for all Americans. For clarity, I do not represent any public or private entity on this matter. These are my own views.

The availability of high-speed internet allows users around the world to communicate, learn, work, conduct commerce, and so much more. These benefits have never been so apparent than during the COVID–19 pandemic when Americans families have been isolated and quarantined, driving households to seek and use broadband technologies, whether via cable, fiber, wireless, satellite, or otherwise, to a far greater extent than ever before.

Despite dedicated efforts, there is no dispute that millions of American households are still without access to broadband. Thankfully, this situation is improving. Over the last several decades, the FCC has taken many steps to facilitate broadband deployment and greater access. During my tenure at the agency, in both minority and majority capacities, I helped spearhead efforts to reform and modernize existing programs and initiate key new ones. These programs are working and helping to shrink the unserved household population.

Respectfully, there are a host of issues addressed in H.R. 1848 that deserve more attention and major revisions, but I will focus my comments on the broadband access provisions because they are so questionable.

Experience has shown that there are two leading ways to extend broadband to the unserved. First is through very targeted, well-thought-out subsidy programs that focus directly on unserved Americans and exclude areas that the private sector is already serving or ready to serve.

Second, barriers to private-sector deployment must be reduced or completely eliminated. Again, respectfully, I find the LIFT America Act severely lacking for these reasons.

While I appreciate the interest of some to future-proof networks, I disagree with the extensive funding and out-of-touch definition of broadband. For instance, the push for symmetrical speeds at exorbitant levels such as 100 and 100 megabits per second makes little sense. I couldn't figure out where the recommended upload speed came from, so I chatted with some experts in the space. The best anyone can figure out is it came, at least in part, from the Fiber Broadband Association filings.

In a 2021 table, the association assumed a household would have two HD video streams with an upstream requirement of 5 megabits per second, one AR/VR stream with an upstream requirement of 40 megabits per second, three securing monitoring streams with an upstream 2 megabits per second requirement, and a gaming stream with an upstream requirement of 20 megabits per second, for a total of 82. Think about that. Almost half of the upload speed is for AR/VR, which is, at best, extremely raw. And gaming for the average family, a 100 meg upload speed does not reflect reality for

now or any time soon. And if I read the bill correctly, 20 percent of 80 billion or 16 billion will go to one gigabit upload. I also don't think the overall broadband can handle 80 billion, and I implore you to consider a level closer to 20 billion.

The consequences of these policies are very significant. Essentially, such a push for inflated broadband speed will lead to gigantic level of subsidized overbuilding since most of the Nation does not meet the new definition. It wipes away any technology other than fiber and scraps all Federal broadband programs. This would not only be wasteful but discourage private-sector investment and employment.

Equally important, government spending on served or scheduled-to-be-served areas with very functional broadband siphons the energy and ability to address those Americans who are truly unserved. If passed, all efforts will shift to easier and richer areas over these unserved areas without 25/3 today. We are so close on this.

On a related topic, the simple fact is that some States and local governments and private company limitations are acting as barriers to greater deployment. I am pleased to see the broader rate of legislative efforts introduced by committee members to address many of these obstacles. The record is clear. Providers can face high fees to utilize existing communications infrastructures, poles, docks, conduits, and the like or conduit and processes to gain rights-of-way and zoning approvals. They also encounter limitations on the placement or expansion of wireless facilities. Yet the bill excludes any attempt to fix this colossal mess. By not addressing this, the committee is effectively making broadband deployment slower and more expensive.

On the positive side, I appreciate the efforts by the committee to continue to exclude State and local government 9–1–1 fee diverters—specifically New York, New Jersey, Rhode Island, and Nevada—from receiving any of the new Federal grant moneys identified for modernizing 9–1–1 networks.

I stand ready to answer any questions of the committee. Thank you very much.

[The prepared statement of Mr. O'Rielly follows:]

**STATEMENT OF MICHAEL P. O'RIELLY**
**PRINCIPAL, MPORIELLY CONSULTING, LLC, AND**
**VISITING FELLOW, HUDSON INSTITUTE**
**BEFORE THE HOUSE ENERGY & COMMERCE COMMITTEE**
**HEARING ENTITLED, "LIFT AMERICA: REVITALIZING OUR NATION'S INFRASTRUCTURE AND ECONOMY"**
**MARCH 22, 2021**

Committee Chairman Pallone, Ranking Member McMorris Rodgers, Subcommittee Chairman Doyle, Subcommittee Ranking Member Latta, and Members of the Committee, thank you for inviting me to share my views on the communications portions of H.R. 1848, the "LIFT America Act", and efforts to expand broadband deployment for all Americans. It is a pleasure to return to where my career began, even if only virtually. I also extend my appreciation for your continued public service to our nation, despite the unfair and inappropriate criticism often laid before this body.

The availability of high-speed Internet allows users around the world to communicate, learn, work, conduct commerce, and so much more. These benefits have never been more apparent than during the Covid-19 pandemic when American families have been isolated and quarantined. In fact, in some instances, including access to telemedicine/telehealth or testing and vaccine information, the technology has been a lifesaver. These activities have driven Americans to seek and use broadband technologies — whether via cable, fiber, wireless, satellite or otherwise — to a far greater extent than previously.

Appreciatively, our networks have stood up to the pandemic challenge, and America's private broadband sector deserves immense credit for the investment and upgrades it implemented over the years to handle the recent surge in Internet traffic. Reports and anecdotal evidence suggest that companies experienced usage increases of 30 to 50 percent compared to the pre-Covid time period. In contrast to other nations, American broadband providers performed incredibly well, never seeking measures to stymie Internet consumption or reduce speeds in order to minimize challenges to overall network sustainability. It is because of industry's foresight and network advances in prior years that U.S. broadband networks were generally able to sustain these capacity demands. And, the industry should be duly credited for forgoing revenue and fees during the Covid-19 crisis to ensure connectivity to subscribers in financial need, as part of voluntary pledges to the government.

Despite dedicated efforts, there is no dispute that millions of American households are still without access to broadband. Thankfully, this situation is improving. While the exact number of locations without access is currently uncertain, largely due to a problem with broadband mapping, the number of unserved Americans continues to shrink precipitously. More work nonetheless remains.

Experience has shown that there are two leading ways to extend broadband to the unserved. First, it is through very targeted, well thought-out subsidy programs that focus directly on unserved Americans and exclude areas that the private sector is already serving. Introducing aspirational qualifications and questionable policy directions can be unhelpful and counter-productive in achieving this desirable goal. Second, barriers to private sector deployment must be reduced or completely eliminated. Respectfully, for these reasons I find the LIFT America Act severely lacking.

On the positive side, I appreciate efforts by the Committee to continue to exclude state and local government 9-1-1 fee diverters from receiving any of the new federal grant monies identified for modernizing 9-1-1 networks. The current diverting states, specifically New York, New Jersey, Rhode

Island, and Nevada, should remain completely ineligible, until they stop stealing consumer-paid 9-1-1 fees for other purposes.

*Current Federal Efforts*

Over the last several decades, the Federal Communications Commission has taken many steps to facilitate broadband deployment and greater access. During my tenure at the agency in both minority and majority capacities, I helped spearhead efforts to reform and modernize the Connect America Fund, permit standalone broadband offerings by rate-of-return providers, introduce the Alternative Connect America cost Model (ACAM), formulate and initiate reverse auctions to promote efficient use of subsidies, craft the Rural Digital Opportunity Fund, and introduce many other Universal Service Fund reforms. This required countless hours deep in the policy weeds. At no point did I or anyone else ever support the notion that our work was completed. Instead, once an effort was adopted, my attention shifted to the next program needing reform.

Most recently, Congress has provided funding for numerous programs, both at the Commission and at other federal agencies, to further extend broadband's reach to those without access. Federal entities outside of the FCC now administering broadband-related programs include the Department of Agriculture, the National Telecommunications and Information Administration at the Department of Commerce, the Department of Education, and the Department of Treasury. Additionally, other funding has been allocated for very broad purposes, such as the $350 billion in funding to state and local governments as part of the recent Covid-19 stimulus legislation, which can be used for many purposes, including broadband projects.

*Problems with Poorly Designed Programs*

While I sincerely hope that all funding streams accomplish their stated goals, I have concerns about how certain mechanisms have been administered in the past and worry about their potential to undercut the nation's progress in the future. Specifically, there is a major risk that some of the new programs and those being contemplated will lead to subsidized overbuilding, which is not only wasteful, but significantly discourages private sector investment and deployment. It can also threaten the viability of smaller providers, especially in areas that are already receiving federal broadband subsidies. For instance, if a new, competing subsidy program attracts the business of the local school, hospital, and/or large employer, it can completely and artificially skew the economics for maintaining and upgrading existing broadband networks, potentially jeopardizing small providers' abilities to serve residential consumers. Equally important, government spending on served or scheduled to be served areas siphons the ability to address the those Americans who are truly unserved. Every dollar wasted on subsidized overbuilding means a longer wait for those without access.

Coordination between agencies and even within agencies has proven to be extremely difficult to mandate in practice, yet it is essential to preventing subsidized overbuilding. Going forward, congressional efforts to mandate coordination among federal agencies involved in broadband-related programs need to be more specific and robust.

Relatedly, policymakers are faced with the difficult questions of what level of service determines whether a given area should be eligible for subsidies and what performance standard should be expected from broadband providers in order to receive federal government support . In other words, should the definition of broadband be changed? While I appreciate the interests of some to "future-

proof" networks through extensive technical mandates and aggressive and aspirational definitions, I strongly disagree with this approach, since in practice, it means ignoring the most neglected communities and delaying their ability to access very good and functional broadband today. For instance, the push for symmetrical speeds at exorbitant levels — such as100/100 Mbps — makes little sense.

For the vast majority of Americans, unless they are performing remote tele-surgery at home, upload speeds do not need to be symmetrical to download speeds, and that's even taking into account the more extensive video uses seen during the pandemic. Keep in mind that an appreciable portion of increased Internet usage has been in the form of video conferencing, telework, and distance learning, which are rather low bandwidth, taking take far less upstream bandwidth than 4K and high-definition video subscription services." And, setting arbitrary and out of touch speed levels far in excess of expected growth or current usage undermines innovation, since it would effectively eliminate all broadband technologies, except for fiber. Codifying or adopting these exaggerated speeds will steer providers to move investments and deployment to easier to serve areas, further delaying efforts to bring access to all Americans. That is not to suggest that the current speed threshold couldn't be changed, but it must be done very judiciously.

*Obstacles to Deployment*

Despite the great desire of policymakers, providers, and users to ensure broadband access to those without, many restrictions are preventing this from occurring. Specifically, some state and local governments and private company limitations are acting as barriers to greater deployment. Providers can face high fees to utilize existing communications infrastructure — e.g., poles, ducts, conduits — or convoluted processes to gain rights-of-way and zoning approvals. They also encounter limitations on the placement or expansion of wireless facilities.

After years of learning about these issues and seeing them firsthand, I am pleased to see the broad array of legislative efforts introduced by Committee Members to address many of these obstacles. From streamlining the permitting process and addressing approval timelines, to excluding providers from needless reviews and codifying steps the Commission has approved over the last several years, the collection of ideas would go a long way towards fixing existing barriers to deployment and allowing broadband providers to meet the needs for Americans without access. I humbly suggest that many of these provisions — if not all — as well as others, should be included in any broadband package approved by the Committee.

* * *

Broadband is a highly valuable service that can be life changing for many Americans. Exceptional progress has been made over the last decade by the private sector and through various federal programs to extend existing networks and expand opportunities for access. More work remains in this area, but it needs to be accomplished thoughtfully and carefully, lest it cause more harm than good.

Mr. PALLONE. Thank you, Mr. O'Rielly.

Next, we have Mr. Wheeler. You are recognized for 5 minutes.

**STATEMENT OF TOM WHEELER**

Mr. WHEELER. Thank you, Mr. Chairman, Ranking Member, members of the committee. It is a privilege to be back before you again.

The LIFT Act is historic, and that is not just hyperbole. It is historic because it recognizes that the almost 100-year-old approach that supported the expansion of electric and telephone service into rural America doesn't work for broadband. The legislation creates a new plan for universal service, a build-it-once plan, that not only will deliver broadband but also will finally stop the drip, drip, drip of billions of dollars constantly being paid out with limited results.

The bill is also historic in that it recognizes that the 40-year-old Reagan administration program to support low-income telephone service is inadequate to support broadband. The Lifeline program was the right idea, but it was built for telephone service, not broadband. It was built for the ability to call 9–1–1. But in terms of both costs and capabilities, that is far different from the needed support to go online to go to school, to apply for a job, or to get a COVID shot. So I am not engaging in hyperbole when I say this is a once-in-a-generation, maybe once-in-a-century, opportunity.

A few quick points that are covered in more detail in my written testimony. Solving the rural broadband problem once and for all requires supporting the buildout the same way we build highways. Pay it once. The 1930s model that subsidized rural telephone and electric service is inadequate for subsidizing broadband. You build a telephone phone network to get a dial tone. You build an electric network to flip a switch. But building a scalable broadband network is not as simple because of the ever-increasing demands for throughput. Thus far, we have repeatedly subsidized just-good-enough networks that were soon outdated. This bill focuses on subsidizing future-proof networks. The bill focuses on unserved rural and Tribal areas, breaking out of the trap of always having to hope for another round of subsidies just to catch up.

While I was Chairman of the FCC, we increased the definition of broadband to 25/3—25 megabits down, 3 megabits up—and today that is only inadequate. I have included in my written testimony AT&T's forecast of how usage in 2025 will far exceed today's usage. And it is because of that exponentially expanding usage that today 80 percent of Americans can get 1 gigabit service—1 gigabit service. Private capital didn't build that capacity to waste money but to meet demand. Public moneys have an even higher obligation to prevent 20 percent of Americans from being trapped in second-class service and to spend taxpayers' dollars as wisely as private capital is spent. To catch up on the other 20 percent of Americans means building with fiber and hybrid fiber coaxial.

I have appeared many times before this committee promoting the wonders of wireless connectivity and I remain a wireless advocate, but wireless is constrained by the finite nature of spectrum from being a full-fledged substitute for wider broadband. At last week's analyst meeting, AT&T reported that average household data would grow to 1½ terabytes by 2025 and that usage of this mag-

nitude won't be supported by mobile networks on frequencies below 6 gigahertz and that the traffic mix will shift towards the uplink, thus favoring fiber and full duplex HFC. If AT&T is spending private capital to build that future, public funds must have an equal discipline to invest for that future.

The LIFT Act also is historic in its funding of broadband subsidies for low-income Americans through the emergency broadband benefit program. The EBB is a breakthrough because it identifies that broadband support should be different from telephone support. The LIFT Act appropriately funds the EBB, but ultimately what is necessary is a permanent solution for low-income consumers in rural and urban America just like a permanent solution for rural development. The LIFT Act is also historic because of its procompetitive initiatives, such as transparency, noncorporate network ownership, and the collection of pricing information.

And, finally, Mr. Chairman, a personal observation. I made it a point in every single appearance I made before this committee as Chairman to highlight the need for support to upgrade our Nation's 9–1–1 capabilities. This bill does that. This bill will save lives. Thank you.

[The prepared statement of Mr. Wheeler follows:]

Written Testimony of

**Tom Wheeler**
Visiting Fellow, Brookings Institution
Senior Fellow, Harvard Kennedy School

Before the
Congress of the United States
House of Representatives
Committee on Energy & Commerce

# LIFT America: Revitalizing our Nation's Infrastructure and Economy

March 22, 2021

Chairman Pallone, Ranking Member McMorris Rodgers, Members of the Committee, it is a privilege to appear before you again.

The Leading Infrastructure For Tomorrow's America (LIFT) Act means that everyone in America can finally have the 21st century communications services they will need to participate in our society, our economy, and our democracy. Because it departs from the disconnects resulting from trying to make internet era realities work within telephone era concepts, LIFT is an historic opportunity for all Americans to redefine their expectations about the high-speed broadband service that is necessary to experience the benefits of the internet.

The internet is the most powerful platform in the history of the planet. Unfortunately, it is not yet pervasive.

COVID has made us re-appreciate the things the internet allows us to accomplish. COVID has also identified the adverse effects arising from the absence of adequate high-speed broadband, whether it is unavailable, inadequate, or too expensive. Just look at the headlines:

**"Why rural Americans are having a hard time working from home"**
CNN 4.29.20

**"America's Terrible Internet Is Making Quarantine Worse"**
The Atlantic 8.17.20

**"School sends California family a hotspot after students went to Taco Bell to use their free WiFi"** CNN 8.31.20

**"The latest crisis: Low-income students are dropping out of college this fall in alarming numbers *Many low-income students say they don't have good enough WiFi at home to take online classes"***
Washington Post 9.16.20

**"A year into the pandemic, thousands of students still can't get reliable WiFi for school"** USA Today 2.4.21

Members of the committee, examples like this are not an example of the Digital Divide, they tell the story of a Digital Chasm. Crossing that chasm means expanding support for both broadband deployment and adoption.

## BROADBAND DEPLOYMENT

This legislation authorizes $80 billion for broadband deployment – and it does it in a manner similar to how our nation deployed another network, the interstate highway system: with "pay for it once" grants. For too long we have been stuck with 1930s thinking about subsidies to operating companies. What worked for electricity and telephones, however, has failed to deliver high-speed internet to unserved areas.

The FCC has spent approximately $40 billion over the last decade in high-cost subsidies. These expenditures have, no doubt, produced results, but they have failed to deliver the goal of universal access to high-speed broadband. The program failed in this regard because it failed to insist on futureproof technology, failed to establish meaningful standards, and focused more on the companies being subsidized than the technology being used or the people who were supposed to be served.

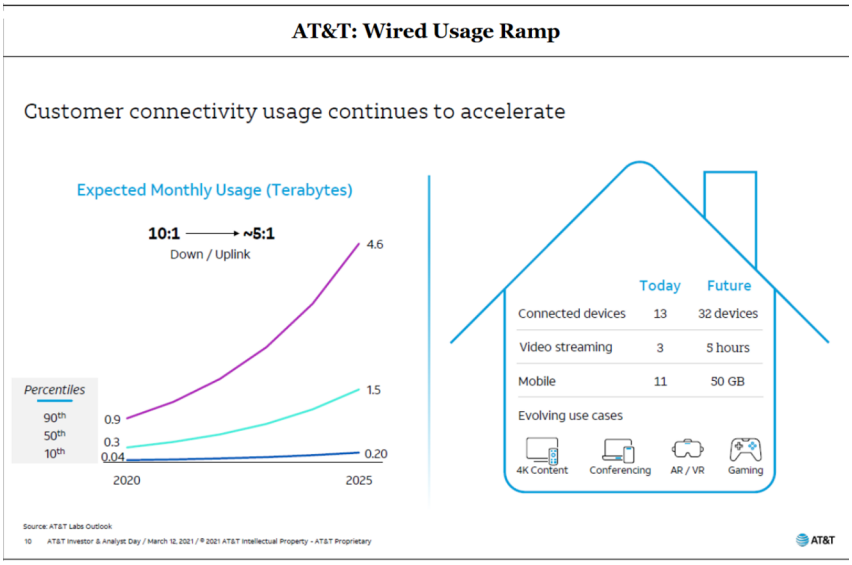
To address the broadband deployment challenge requires resolving multiple issues:

***Definition of "Broadband"*** – The recent letter to the FCC and other agencies by a bipartisan group of Senators called attention to a matter this bill addresses head-on: how the present definition of "broadband" is substandard. As a result, they wrote, federal funds were being spent on new connections that were "not capable of providing sufficient download and upload speeds and quality." The senators recommended a symmetrical 100 Mbps down and 100 Mbps up as a baseline for new subsidized deployments. The LIFT Act – wisely, I believe – goes beyond that to prioritize gigabit service.

It was during my tenure that the FCC voted to increase the definition of "broadband" to 25 Mbps into the location (the so-called "down" speed) and 3 Mbps out ("up"). The previous standard had been 4 Mbps down and 1 Mbps up. At the time I described the new definitions as the minimum "table stakes" for viable internet speed. Today, half a dozen years later, that speed is completely unacceptable. It is not adequate for today, and certainly is far from adequate for tomorrow.

According to the Bandwidth Calculator of the non-profit organization Broadband Now, the amount necessary for a family of four, each with their own smartphone, sharing two laptops, two TVs, two tablets, one game console and a smart home device such as Alexa requires a service of 108 Mbps downstream. That is four times the current definition of what constitutes "broadband" and thus four times (and sometimes more) than current government programs require to receive subsidy dollars.

A presentation at the recent AT&T analyst day forecast that by 2025 customer usage of internet connected devices in the home would soar beyond the calculations just cited, thus bringing even greater demand for throughput – including a doubling of upstream traffic – as well as driving up the total amount of data being consumed:



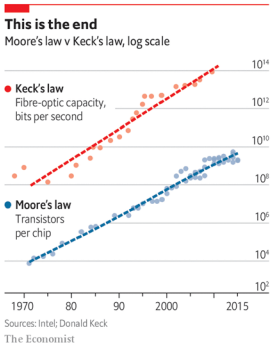

The challenge is not those areas where private enterprise has delivered high-speed internet access. Internet service providers (ISPs) should be applauded for the fact that today, according to NCTA, 80 percent of American homes have access to 1 gigabit (Gbps) internet service. If 80 percent of Americans can receive access to 1 Gbps today, then any infrastructure plan should prioritize a pathway to such level of service for **all** Americans. The LIFT Act correctly makes such a prioritization for symmetrical 1 Gbps service.

***Futureproofing Public Expenditures*** – Too often the existing federal broadband programs have subsidized what can only be characterized as the network of yesterday. Not only should such funds build an up-to-date network, but also a network that is futureproofed from becoming inadequate in a few years.

Now, I know that many believe in the future of wireless gigabit throughput. I have long been an advocate for wireless connectivity; but the consequence of the finite nature of radio spectrum

is that it is not a full-fledged substitute for wired broadband. There may exist in the lab, and in limited installations, gigabit wireless delivery, but it is not widely applicable for broadband point-to-multipoint deployment. Even the major wireless carriers that invested heavily in FCC-run auctions of millimeter wave spectrum as a high-speed delivery pathway have cut back both their expectations and promises for widespread, point-to-multipoint wireless delivery at gigabit speeds. Wireless may be a last resort option in the most isolated areas, but it should not be a first resort for most of America.

To prioritize symmetrical 1 gigabit capacity, as the bill does, is to prioritize a "fiber first" policy.[1] Fiber's benefits are driven by the combination of increased processing power at the ends of the fiber (exemplified by Moore's Law) and the ability to handle that increasing capacity (Keck's Law). While both Moore's Law and Keck's Law may be slowing from their exponential pace, applying increased processing to the data flowing through a conduit that itself has increasing capacity is the definition of futureproofing. This chart is revealing about how the capacity of fiber has continued to grow over the years along the lines of Moore's Law – a phenomenon that policy should embrace.

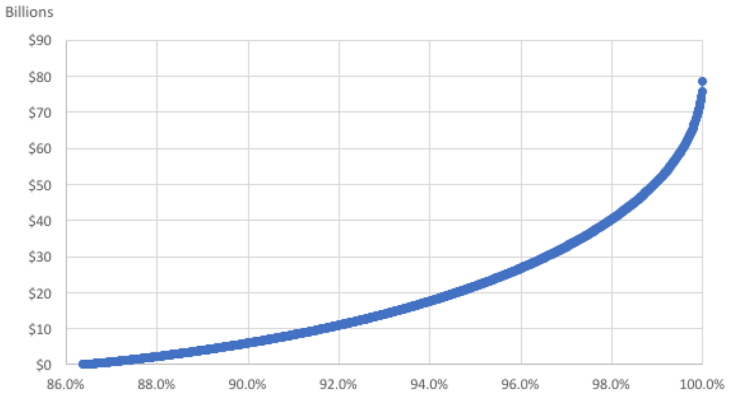



***Pay for Buildout Once*** – The LIFT Act wisely chooses a "pay once" strategy to subsidize broadband construction. In a January 2017 analysis, the FCC calculated that a one-time $80 billion payment would build out fiber-to-the-premise (FTTP) to all unserved locations. Significantly, about half that amount could build FTTP to 85 percent of unserved locations (so that approximately 98 percent of all locations in the nation would have broadband service) and that construction could become a self-sustaining business. The final $40 billion would build out the final 15 percent (or two percent of all locations), but would require an ongoing operational

[1] Such a policy is consistent with the hybrid fiber-coax (HFC) strategy of cable systems' DOCSIS 4.0 and its 10 Gbps down/6 Gbps up capability https://www.cablelabs.com/technologies/docsis-4-0-technology

subsidy estimated at around $2 billion annually (or about half the current High Cost Fund subsidy).

***Figure 1: Estimated cumulative investment required to increase fixed broadband deployment from the current 86% to 100% of U.S. locations.***




Source: www.fcc.gov/general/connect-america-fund-phase-ii-models (last visited January 16, 2017).

This study demonstrates how it is possible to build broadband like we build highways: figure out what it costs and pay a qualified workforce once. While this study has not been updated, it remains a fair estimate of the total amount required for the policies in the LIFT Act to be implemented. While there have been expenditures and appropriations since 2017, the $80 billion number remains a rational forecast. This is because while the 2017 study used the best maps available at the time, as this committee knows those maps were seriously flawed and underestimated unserved areas by assuming that if one location in a census block could get broadband service, then the entire census block had broadband service available. It would be unrealistic for the new maps ordered by this committee in the 2020 Broadband DATA Act to not identify significantly more unserved locations. Another adjustment to the 2017 estimate would be the Act's wise expansion of target areas to include not just unserved areas, but also "low tier" service areas.

***Mapping*** – Tomorrow is the first anniversary of this committee's Broadband DATA Act being signed into law. The committee's action was crucial to rectifying the Commission's lack of meaningful knowledge about the deployment of broadband service. Two topics are important to understanding the reality of the mapping challenge.

The first reality is that until recently the companies resisted providing the FCC with adequate information. That, thankfully, has changed. But let's not forget, the internet service providers know where their lines run; they could not manage their business otherwise. The second realization is that it is the matching of those lines with over 150 million address data items that provides the needed information.

Both of these realities are further complicated by the fact that the desired work product really isn't a "map," it is not an atlas you can pull from the shelf – it is a living and constantly changing database.

If ever there should be a bipartisan issue, it is getting that database right – including its constant updating with real time connectivity, not emailed spreadsheets. Acting Chairwoman Rosenworcel has initiated such an effort. Jean Kiddoo, the person she has put in charge of the effort, is among the agency's best.

The old axiom "If you can measure it, you can manage it" has never been truer. Knowing what is happening in the field is essential to running effective programs. At the same time, good management organizes for bringing the different but necessary components together at the assembly point in a synchronized manner. The goal for the Commission and the Congress should be to synch their components. The goal should be that the database is ready when the money is ready to flow.

***Managing Disbursement*** – In order to deploy the dollars identified for broadband deployment, the LIFT Act proposes a competitive bidding system. Such a Dutch auction was successful in the

Broadcast Incentive Spectrum Auction. This process reveals the true amount of subsidy necessary to make different projects economically viable and then awards the subsidy at the lowest possible level to meet that need.

The auction team at the FCC is the best in the world, having run over 100 auctions. What is often forgotten, however, is that running the bidding, while by no means easy, is only as good as the rules that determine the details governing that bidding and who gets to participate. The recent RDOF auction was an example of a good idea poorly managed. In selecting among bidders, it is necessary to look beyond network speed and latency as the only criteria. There must be rigorous pre-qualification tests for bidders to determine both their financial, construction, and operational experience and capabilities. The FCC must have a clear understanding of the scalability, sustainability, durability, resiliency, and reliability of what the public's money will be buying.

There is a three-part test to consider when developing plans to expend public monies to subsidize broadband. First, to exploit the marketplace efficiencies of auctions. Second, to recognize the subsidies are for areas where service would not otherwise be provided absent such subsidy, not to pay for a service that has already been financed by private funds. Third, the need for results is immediate; waiting for multiple years to see if bidders deliver is unacceptable. And there need to be consequences for promises not kept.

## BROADBAND ADOPTION

The other great failure of our national policy is how low-income Americans may have broadband passing their door, but do not bring it inside. One calculation, using Census Bureau data, estimated nearly 80 percent of those without broadband in their home have it available outside their door but choose not to use it. A Pew Research report found the biggest reason for this is that the monthly cost is "too expensive."

There are more – by some estimates multiple times more – Americans who have broadband passing their residence but do not use it as there are unserved Americans. A recent study found 40 percent of US seniors lack sufficient broadband. This occurs at precisely the moment when you need the internet to sign up for a COVID vaccination, telehealth is of increased importance, safe shopping means online shopping, and social interaction is confined to video services. At the other end of the age spectrum, almost 10 million students do not have the home internet needed for distance learning.

To address the broadband adoption challenge requires resolving multiple issues:

***A Phone Program in an Internet Era –*** As with the deployment challenge, the federal government's efforts to address internet adoption tried to shoehorn internet access into telephone policy. The Reagan administration's decision to pay $9.25 per month to subsidize basic telephone service meant that everyone would be able to call 9-1-1. It was called "Lifeline" service, but it was limited to what was known at the time – *i.e.,* "telephone" service.

In 2016, the FCC expanded Lifeline to subsidize low-income broadband service, both wired and wireless. The problem was that the $9.25 subsidy does not go very far when it comes to helping pay for a broadband connection that averages almost $70 per month. According to Pew Research there is a 36 point gap in broadband penetration between the 92 percent of adults in households earning $75,000 or more with broadband, and the 56 percent of adults in households earning less than $30,000 annually.

A Benton Foundation study found low-income Americans can afford about $10 per month for broadband service. Providers of smartphone-based services have been able to price below this benchmark and to make a business out of the $9.25 subsidy, but that service is weak tea compared to fiber, with slower data speeds, data caps that limit internet usage, and devices with small screens and tiny keyboards.

***Emergency Broadband Benefit Program –*** When Congress created the Emergency Broadband Benefit Program (EBB), it helped break out of the Lifeline conundrum. Authorizing and funding the FCC to provide up to $50 per month in broadband support for eligible households put an end to shoehorning broadband support into a program designed for another purpose. Lifeline should be for telephone service, as it has been since the Reagan administration, while a separate broadband program deals with the expanded needs of the 21st century. The additional $9.3 billion in the LIFT Act will allow that differentiated broadband program to continue beyond the current appropriation.

When applied to the average broadband subscription price, the EBB benefit brings the affordability of high-quality broadband closer to the $10 level in the Benton Institute study. But the EBB is an emergency program. The additional funds the LIFT Act authorizes are important to the continuation of the emergency program. Before long, however, it will be necessary to remove "emergency" and institute an ongoing program with a long-term funding mechanism.

***Non-Price Adoption Issues –*** The LIFT Act not only helps to reduce the effective cost of broadband connectivity by funding the EBB, but also attacks the more complicated question of digital readiness: the training and tools necessary to maximize that connectivity. Among these often interconnected issues are the simple lack of a computer and training in its use, fear of the unknown including concerns about privacy, and how to control internet content.

COVID has increased awareness among non-adopters as to why access to the internet is important. By funding state level digital equity programs, the LIFT Act wisely puts such adoption programs closer to the intende recipients.

***Implementation –*** If good maps are the *sine qua non* of the deployment support programs, the validation of eligibility to participate in a broadband support program – whether Lifeline or EBB – plays an equally important role in the adoption support effort. In 2016 I complained about how the Lifeline program allowed the companies receiving the subsidies to verify the eligibility

of customers. It was like "the fox guarding the henhouse," I said. To address that issue, as well as make it easier for individuals to apply for Lifeline, we created a third-party National Eligibility Verifier.

A key component of the Verifier is the ability to coordinate its efforts with already existent databases used to validate participation in other federal support programs such as the Supplemental Nutrition Assistance Program (SNAP). Unfortunately, five years after the creation of the Verifier it still has not been implemented in all 50 states. The LIFT Act identifies that as a problem and orders that the necessary integration and cooperation occur.

## PROMOTING COMPETITION, TRANSPARENCY AND PUBLIC SAFETY

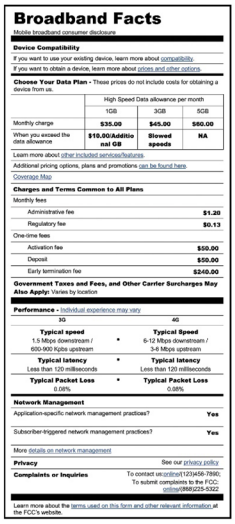
There are numerous other important initiatives in the LIFT Act that are worthy of support including: innovative loan programs administered by NTIA; collection of data, including pricing data, to determine network resiliency; E-Rate support for school bus WiFi; and requiring open access to the networks that are constructed with federal funds. There are three specific provisions that I want to close this testimony by emphasizing:

***Non-Corporate Broadband –*** For too long there have existed anti-competition, anti-consumer state laws that prohibit local governments, public-private partnerships and cooperatives from delivering broadband service. These laws were passed by state legislatures and have had the effects of denying the benefits of competition to citizens. The LIFT Act appropriately preempts these anti-competitive statutes.

***Pricing and Information Transparency –*** One of the lessons we learned in the reform of the E-rate program was the importance of transparency about pricing. The market is a wonderful enforcer if the purchaser is well informed and, for instance, knows what others are paying for a service. The LIFT Act would promote transparency for consumer broadband prices by requiring the FCC to collect from service providers data about the price of broadband service plans and

subscription rates. One of the reasons the per Mbps price for E-rate services declined by 90 percent was the mandatory transparency that allowed school districts to know what others were paying.

Another way of helping to create informed consumers is to require information transparency. In 2016 the FCC adopted what we referred to as "nutritional labeling" for broadband. Its implementation unfortunately was a casualty of the change in administration.



**Broadband Facts**

Mobile broadband consumer disclosure

**Device Compatibility**

If you want to use your existing device, learn more about compatibility.

If you want to obtain a device, learn more about prices and other options.

**Choose Your Data Plan -** These prices do not include costs for obtaining a device from us.

| | High Speed Data allowance per month | | |
|---|---|---|---|
| | 1GB | 3GB | 5GB |
| Monthly charge | **$35.00** | **$45.00** | **$60.00** |
| When you exceed the data allowance | **$10.00/Additional GB** | **Slowed speeds** | **NA** |

Learn more about other included services/features.

Additional pricing options, plans and promotions can be found here.

Coverage Map

**Charges and Terms Common to All Plans**

Monthly fees

| | |
|---|---|
| Administrative fee | **$1.20** |
| Regulatory fee | **$0.13** |

One-time fees

| | |
|---|---|
| Activation fee | **$50.00** |
| Deposit | **$50.00** |
| Early termination fee | **$240.00** |

**Government Taxes and Fees, and Other Carrier Surcharges May Also Apply:** Varies by location

**Performance -** Individual experience may vary

| 3G | 4G |
|---|---|
| **Typical speed** 1.5 Mbps downstream / 600-900 Kpbs upstream | **Typical Speed** 6-12 Mbps downstream / 3-5 Mbps upstream |
| **Typical latency** Less than 120 milliseconds | **Typical latency** Less than 120 milliseconds |
| **Typical Packet Loss** 0.08% | **Typical Packet Loss** 0.08% |

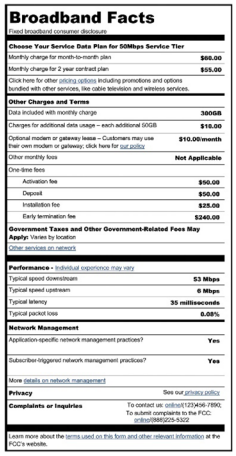
**Network Management**

| | |
|---|---|
| Application-specific network management practices? | **Yes** |
| Subscriber-triggered network management practices? | **Yes** |

More details on network management

| | |
|---|---|
| **Privacy** | See our privacy policy |
| **Complaints or Inquiries** | To contact us: online/(123)456-7890; To submit complaints to the FCC: online/(888)225-5322 |

Learn more about the terms used on this form and other relevant information at the FCC's website.



**Broadband Facts**

Fixed broadband consumer disclosure

**Choose Your Service Data Plan for 50Mbps Service Tier**

| | |
|---|---|
| Monthly charge for month-to-month plan | **$60.00** |
| Monthly charge for 2 year contract plan | **$55.00** |

Click here for other pricing options including promotions and options bundled with other services, like cable television and wireless services.

**Other Charges and Terms**

| | |
|---|---|
| Data included with monthly charge | **300GB** |
| Charges for additional data usage – each additional 50GB | **$10.00** |
| Optional modem or gateway lease – Customers may use their own modem or gateway; click here for our policy | **$10.00/month** |
| Other monthly loss | **Not Applicable** |

One-time fees

| | |
|---|---|
| Activation fee | **$50.00** |
| Deposit | **$50.00** |
| Installation fee | **$25.00** |
| Early termination fee | **$240.00** |

**Government Taxes and Other Government-Related Fees May Apply:** Varies by location

Other services on network

**Performance -** Individual experience may vary

| | |
|---|---|
| Typical speed downstream | **53 Mbps** |
| Typical speed upstream | **6 Mbps** |
| Typical latency | **35 milliseconds** |
| Typical packet loss | **0.08%** |

**Network Management**

| | |
|---|---|
| Application-specific network management practices? | **Yes** |
| Subscriber-triggered network management practices? | **Yes** |

More details on network management

| | |
|---|---|
| **Privacy** | See our privacy policy |
| **Complaints or Inquiries** | To contact us: online/(123)456-7890; To submit complaints to the FCC: online/(888)225-5322 |

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The goal of the label was to help consumers understand what they were buying. In that regard, it is not only similar to food label information, but also the financial information required on every credit card statement. This format has been developed, coordinated with the agency's consumer advisory committee, and is ready to go.

***Next Generation 9-1-1 –*** As I conclude, I must address one extremely important component of the LIFT Act: the authorization of $15 billion in grants for the deployment of next generation 9-

1-1 (NG911). Every time I testified before this committee as Chairman, I made it a point to talk about the need to bring 9-1-1 into the digital age and how that required funding support for local governments and public safety agencies. The LIFT Act will not only connect Americans to the most important network of the 21st century, but it will also save lives.

**

Mr. Chairman and members of the Committee, this bold initiative has been a long time coming. It creates the opportunity to finally address the internet inadequacy on a holistic rather than piecemeal basis. It will make lives better for students and seniors. It will boost the economy by making available everywhere the services we have come to rely on during COVID. It will create jobs and invest in America's future. This is a great step forward.

Mr. PALLONE. Thank you, Mr. Wheeler.

And that concludes our witnesses' opening statements. So we are now going to move to Members' questions. Each Member will have 5 minutes to ask questions of our witnesses, and I am going to start by recognizing myself for 5 minutes.

I want to get to three questions, so I am asking you each to be brief.

First, to Secretary Moniz, I appreciate your hard work at DOE and especially the comprehensive Quadrennial Energy Review reports, which we would always mention. The committee is actually going to hold two hearings on the Texas power crisis this week, and I think that highlights the need for robust grid infrastructure.

So my question is, What are the specific benefits of good modernization, especially as it relates to resiliency and also meeting our climate goals? Does the Texas power crisis present any specific lessons about not prioritizing investments in our Nation's energy infrastructure? You are supposed to answer that in about a minute.

Dr. MONIZ. Well, thank you, Mr. Chairman. A few comments on Texas. One of the major lessons, very important, is that, as we do grid modernization, we have to look at the intersections with other infrastructures. In particular, the failed approach to integrate response on the gas side and the electricity side was a huge problem in Texas, so that is important.

Secondly, I would just add more generally, it is the integration of IT and the electricity system on both the high-voltage transmission and the distribution system that will be extremely important for new services and for resiliency and reliability. So, actually, I would just link that as well to your broadband initiative, which is very, very important because that will be part of this integration of IT and grid that is so important.

If I may make one quick observation, I have a rural place in southern Colorado, and we just got fiber optics, and it is a revolution in what you can do in a rural setting, so I just wanted to make that observation. Thank you, Mr. Chairman.

Mr. PALLONE. And Ms. DeGette just put fingers up on that one.

Let me go to Dr. Frieden. I know you really stress that the COVID has, you know, highlighted the chronic underfunding of State and local health departments as well as the Federal public health system. Can you explain why a predictable, stable, and consistent funding for public health infrastructure is so critical? And even though we have provided some funding during CARES Act, that it isn't sufficient for the long-term sustainability of the public health system? Again, you have about a minute.

Dr. FRIEDEN. Let me just give you the experience of someone who has run public health agencies for decades. When you get one-time money, there are certain things you just cannot do. You can't necessarily recruit the best staff because they know that in 2 or 3 or 5 years, they won't have a job. You can't necessarily hold contractors accountable because if they don't do a great job, they think, eh, the money is gone next time. You can't have partnerships with State, local, county, or global partners who can trust you because when the money dries up, you are going to pull the rug out from that partnership, and that is exactly what happened after Ebola.

Congress devoted hundreds of millions of dollars to really important programs, and we worked hard, hard, hard to collaborate, figure out who to work with, and then the money dried up and dozens of countries had to be defunded. CDC operations stopped, including China. And that might have changed—we don't know, but it might have changed the trajectory of the pandemic. So we need a consistent approach, not an on-and-off approach.

Mr. PALLONE. I agree. Thank you so much.

And then, finally, Chairman Wheeler, I know you said that the bill before us is a good approach, but if you just would spend a minute telling us again why it is important that we make a really bold investment in broadband right now at this time.

Mr. WHEELER. Well, thank you, Mr. Chairman, but I mean, let's look at we are confronted right now with multiple existential crises, and the fascinating thing is that every single one of those can be attacked using broadband. Broadband helps alleviate those crises.

We are facing a pandemic, but responses could be coordinated, and surely shots—you have to have broadband to be able to get a shot. We are facing an economic crisis. The new digital economy, the creation of jobs and economic growth, builds on broadband. We are facing a social justice crisis: 10 million schoolkids can't have distant learning because they don't have broadband; 40 percent of seniors don't have access to broadband. And we are facing a climate crisis, and broadband does help reduce emissions. So my point that I would make in response to your question is here is one tool that can attack four of the major existential crises that we as a Nation are facing today.

Mr. PALLONE. Thank you.

Now I am going to go to Mrs. Rodgers, the ranking member, for 5 minutes. I yield to her.

Mrs. RODGERS. Thank you, Mr. Chairman.

Thank you, Mr. O'Rielly. You are the only minority witness today to discuss this massive bill, and I look forward to hearing you on the important topic of broadband deployment.

However, this bill does much further than just wasting billions of taxpayer dollars on an ineffective broadband deployment program. It also contains over $100 billion in funding to subsidize unreliable renewables over clean baseload power, like natural gas, nuclear, mandates electric vehicles and electric vehicle infrastructure which will further burden our grid.

That is why I requested another witness, former Deputy Secretary for Energy Mark Menezes, to testify on the massive expansion of government in the energy sector. Unfortunately, this request was rejected by the majority. We did have two minority witnesses for our last full committee hearing on this bill when it was less than half the cost of the current bill.

Had he been allowed to testify, I would have asked him how the LIFT Act further weakens our grid reliability, increases our dependence on China, and prioritizes urban areas at the expense of rural America. These are important questions that we should have been allowed to explore today.

But the negative effects of this bill and what it would have on our broadband deployment are equally important. The legislation

spends over $100 billion on broadband funding, but I am concerned that it will only widen the digital divide. It increases the minimum speed thresholds for areas to be considered severe so that every part of America will be eligible for this funding.

What does this mean? It means that Americans with zero broadband service today will even move further to the back of the line while ambiguous, quote, "anchor institutions" get gold-plated service. This bill also directs the FCC to expand the E–Rate program to serve households in addition to schools and libraries, something already funded by other Federal programs.

Mr. O'Rielly, what are some of the real impacts to Americans and the communication landscape in this country if this bill passes?

Mr. O'RIELLY. Thank you for the question. You are absolutely right that if this bill were to pass, the dollars would go to those areas that are easier and more well-to-do than those Americans who don't have broadband today, depending how the count—whether it is 14 million or 20 million Americans don't have broadband.

And I would agree with Tom Wheeler's point that he just made on the benefits of broadband, but all of those things that he highlighted can be done with the current speeds, certainly on the upload side. You know, in terms of getting your pandemic appointment, you can do wirelessly in most instances. So the idea that you need this advanced network that we are talking about in the bill is not necessarily true to his point.

But to yours, and it is very valid, you know, that the anchor institutions will have extensive buildout and serving the community, which will depress the private investment by those communities trying to survive with small providers with very little money. I have dealt with those companies, and I have sat in those kitchens of those Americans without service, and they will be deprived. They will be put at the back of the line and dealt with another day as other things become priority.

Mrs. RODGERS. Thank you. You know, in my district, we have needs in urban Spokane. We also have needs in the rural underserved areas. I represent remote and very difficult-to-serve counties in eastern Washington. In your opinion, Mr. O'Rielly, will this bill close the digital divide between urban and rural areas?

Mr. O'RIELLY. I would think that it would widen it in terms of my previous experience, and I happen to have visited your district or just outside and some of the rural parts. My sister lives there, and so I have seen the territory and the mountainous regions where she lives. And so I believe that this would make it harder to serve those communities that don't have broadband today.

Mrs. RODGERS. So what would be the best way to close the digital divide, once and for all?

Mr. O'RIELLY. I would target the money towards those programs that are already operating and focus on those 14 to 20 million Americans or whatever the exact number is. The Commission has been working hard on this. It is taking criticism for the RDOF program, but the heart of the RDOF program will be beneficial in getting to phase two and getting the maps. All the things that are in line to be addressed will be incredibly beneficial and help solve the problem for those that don't have access today.

Mrs. RODGERS. You brought up the important work of the maps and updating the maps. What is the status of getting the maps updated? It has been over a year since the bill was signed into law.

Mr. O'RIELLY. In fairness, I don't have a great answer. I have been removed for a number of months from the Commission, and what I did hear from my last Senate hearing, that there was talk of doing the maps in 4 months. And I welcome that because they are absolutely needed to move forward on on at least two programs, but that is if the rest of the bill doesn't wipe off those programs completely.

Mrs. RODGERS. OK. Thank you, Mr. O'Rielly.

Thank you, Mr. Chairman. I yield back.

Mr. PALLONE. Thanks to the ranking member.

Now we are going to move to Members. Now, you know, back and forth, Democrat, Republican. I just want to tell everyone—and I know some are going to get not happy with this—but, you know, it is based on seniority at the gavel. If you weren't present on camera at the gavel, then you go to the back of the line, OK.

So the first person is—Ms. Eshoo is recognized for 5 minutes.

Ms. ESHOO. Thank you, Mr. Chairman, and thank you to each one of the witnesses. It is an all-star cast, and it is really wonderful to see each one of you and to not only read your testimony but to hear you make your comments this morning.

I want to go to former Chairman Wheeler for my first. Your colleague, former colleague on the Commission, has offered his critique of the bill. Can you, in a minute, respond to what he has put forward? I think I am hearing in each area essentially people looking in the rearview mirror and thinking they see the future. This bill is all about building out our future in specific areas, whether it is energy, broadband, public health. So can you—would you just respond for a minute?

Mr. WHEELER. Thank you, Ms. Eshoo.

Ms. ESHOO. Yes.

Mr. WHEELER. Thank you very much. You know, I have the greatest respect for my former colleague, and we did work together on——

Ms. ESHOO. And I do too. And I do too.

Mr. WHEELER. But, frankly, I don't get this back-of-line stuff, all right. I mean, the reality is that under the $80 billion plan, which is based on the study that we did in 2017 as to what would it cost to add fiber to every location in America, OK, under that plan, everybody gets access to the network. There is nobody that gets access to the money. There is nobody in the back of the line. Everybody gets the same opportunity to bring their service up to the kinds of levels that the vast majority of America enjoys.

And I agree entirely with your point that we can't fall into the trap of defining tomorrow in terms of yesterday. And what I was trying to point out in my testimony is that AT&T has told us that is not how they are spending money, and they are telling us they are spending money on fiber. This is just in the analysts meeting last week, and that is the kind of approach that public moneys ought to take as well.

Ms. ESHOO. Thank you. Thank you very much.

Dr. Frieden, you rolled out six major points relative to public health. Do you see the LIFT Act addressing those?

Dr. FRIEDEN. I think it is really important. The investments are crucial for our future. What is also crucial is to ensure that they are sustained over time.

Ms. ESHOO. Right. Now, we know that somewhat from NIH. You know, we increased—at one point we doubled the funding, but we went through a period of time where funding was not sustained and it didn't cover the increased costs of living and all of that. So I agree with you.

Do you think that this bill meets those six points, or is there something missing?

Dr. FRIEDEN. I think what is missing is the long-term sustainability, that addressing it is very important. I also think it is very important we look at primary healthcare. I didn't address that in either my written or oral testimony because I was focused more on public health, but if you look, very frankly, the U.S. does not have primary healthcare at the center of our system. And this is something that I truly do believe, like public health, is a bipartisan issue that everyone can agree on. People should have a family doctor, family clinician, urban and rural.

Ms. ESHOO. They are the entry point to the system, they really are, the primary care.

Secretary Moniz, it is wonderful to see you, hear you, read your testimony, and to all of you, your contributions to our country are really significant.

Have we missed something in this legislation?

Dr. MONIZ. I think the infrastructure bill, LIFT, really will make tremendous across-the-board advances. I do think that there is another emphasis that could be stronger in terms of things like the integrated infrastructures, as I mentioned, like large-scale carbon management with hydrogen, for example. If we are going to make net zero and eventually net negative, we will need technologies like carbon dioxide removal from the atmosphere in multiple ways, including terrestrial and mineralization. We need to have our infrastructure minds also focused on these new infrastructures that we will need.

But I think the bill cnertainly moves across the board on each of those four areas I mentioned at the beginning of my testimony.

Ms. ESHOO. Thank you very, very much to each one of you.

Dr. MONIZ. Mr. Chairman, if I may add one other note, Mr. Chairman, besides the—it is just—it reinforced what Tom Frieden said. I also serve as the CEO of the Nuclear Threat Initiative, and in 2019 we issued a public health—a Global Health Security Index. The world was unprepared. The United States was relatively prepared, but the big markdown was lack of access to a robust public health system, just as——

Ms. ESHOO. Thank you. I yield back. Thank you to each one of you.

Mr. PALLONE. Thank you.

Next is—Dr. Burgess is recognized for 5 minutes.

Mr. BURGESS. Thank you, Chairman.

Dr. Frieden, good to see you again. You spent a lot of time in this committee over the last 20 years. It is good to have you back in the committee again.

You know, I don't disagree with many of your points. I do suggest that there is a bit of a disconnect between the bricks and mortar and the actual people who are working within the bricks and mortar.

The reason I bring this up, I was visiting a hospital down in the southern part of Texas last week, and hit hard by coronavirus, the area. Community spread was just beyond what anyone expected in the early days of the illness, and they got hit pretty hard. Now, they managed, and they are coming through, but their biggest problem today is they can't keep staff.

We have made so much money available through other things that their staff kind of gets pulled away by, oh, contract labor arrangements and emergency department staffing arrangements such that, although they have managed during the crisis, they are really having a tough time with their staffing. And I know that is not the purpose of this bill, but I just ask us to be careful when we are pumping money into systems, it is not always done—sometimes there are unintended consequences in places where you might not have expected them.

But kind of along those lines, when you look at all of the healthcare infrastructure investment that has been made going back even to the 1940s, how do we make sure that we are putting the proper emphasis on the staffing, the men and women who are actually going to deliver the healthcare, rather than just the facilities themselves?

Dr. FRIEDEN. Thank you, Dr. Burgess. That is a great question. I am really delighted to dig into it with you.

I am going to make three suggestions, because I think it is a really important issue. We have a shortage of public health staff, 50,000 lines lost in the past 10, 15 years in public health departments. We have a shortage of primary care doctors because, quite frankly, we don't pay enough for primary care. There is no mystery why there are fewer primary doctors: They make a lot less doctors than other doctors, and it is supply and demand.

So I think there are three things that we need to do to address the personnel issue.

First, we need a robust Federal program that embeds staff in State, city, and local health departments, thousands of people who will be on the Federal payroll and rotating from cities and States into and back to Atlanta CDC. We started this in my time with something called the Public Health Associate Program. It is a big success story, but it is a drop in the bucket compared to what is needed. Two hundred people on top year, we would get four or five thousand applications in just a week. So one is CDC embedded staff.

Second, in the healthcare system we need to embrace team-based care, where every member of the team practices at the top of their license. That will make our healthcare system more efficient and better for people. Right now, we don't do that. Pharmacists, nurses, nurse practitioners, physician assistants, and physicians only

should practice at the top of their license. That makes our system much more efficient and the outcomes can be much better.

And, third, we have to address some of the efficiencies. One of them is telemedicine. There is a lot that can be done on telemedicine. Maybe this is one area where the broadband issue and the health issue intersect, because we have seen parts of the country where you can't do telemedicine because you don't have high-speed internet. I have worked on electronic health record programs, both in central city areas, impoverished central city areas, and in rural areas where you can't do it because you don't have fast enough internet connection, however you define broadband.

And you also have to think about the interstate agreements, and this is an issue that I think, you know, would have both bipartisan support and maybe bipartisan opposition. But, fundamentally, what you have in this country is different States have guilds, and they make it difficult for perfectly qualified practitioners from other States to practice in those States.

Mr. BURGESS. I am going to interrupt you there. We call those professional standards.

Dr. FRIEDEN. Sure.

Mr. BURGESS. But I understand what you are saying. Look, I just want to ask you another question, and it kind of goes back to when we talked about the telecom side and the issue was made about the private sector. The private sector is moving faster in the telecom side than, say, the public sector, and this is to some degree true of public health. We saw it big time with the testing available for coronavirus in those early days.

Frank Pallone always said he wanted to see a national testing strategy. We had that at the CDC, and unfortunately it failed us. We only got on top of the testing when we embraced what the private sector could bring to the equation as well, and we saw the same story, essentially, in vaccines.

So it is not a silo. We do have to allow the participation and the energy and enthusiasm of the private sector as well.

Dr. FRIEDEN. Total agreement. It is an all-of-the-above need. The CDC provides public health laboratory testing, academic medical centers provide great testing for their centers, and the private sector, well-regulated and supported, provides quality testing for the country.

Mr. PALLONE. All right. Thank you.

Thank you, Dr. Burgess.

Next is Mr. Doyle.

Mr. DOYLE. OK. Thank you, Mr. Chairman.

Chairman Wheeler—and Tom, it is good to see you back here in front of the committee.

Mr. WHEELER. Mr. Chairman.

Mr. DOYLE. I just find it amazing that my colleagues on the other side of the aisle seem to be telling their rural constituents that any kind of broadband is better than no broadband at all, and that you should be happy to get yesterday's broadband because right now you don't have anything. But it seems to me if we are going to keep building networks that are already antiquated by the time we put them in the ground, we are just setting up people and the networks

being built for failure. So I think you have made that point pretty clear.

I want to talk, you know, the LIFT America Act includes billions of dollars for broadband adoption and language to ensure that people have access to affordable service. In communities like my own in Pittsburgh, our main problem isn't deployment, although more competition would be nice, but the big barrier to adoption is the high price of service.

So why is closing the affordability gap more important than ever in this bill?

Mr. WHEELER. Well, thank you very much, Mr. Doyle.

I mean, the fascinating thing is that more people could get broadband but don't get broadband than the number of people who can't get broadband. And why is that?

Mr. DOYLE. Can't afford it?

Mr. WHEELER. The principle reason—Pew Research went out and did a study, and they found the principle reason was price. The average broadband monthly fee is $70 and up. Benton Foundation, now I guess called the Benton Institute, did a study of low-income Americans of which they said, you know, "With all of the other priorities we have in life, we can afford about $10 a month."

There is the answer to your problem, sir. It is what does it cost versus what is affordable. And it is wonderful what EBB has done to address that affordability problem. The point that I have been making in my prepared as well as my direct remarks here is that we have to find a permanent solution that enables the access for those that have the wire going past their door, but they can't afford to bring it in.

Mr. DOYLE. Right. Chairman Wheeler, my colleagues seem to think that their constituents in rural communities are going to someday be served by 5G, but we both know that if you don't have dense fiber networks, you can't have 5G.

Mr. WHEELER. Right.

Mr. DOYLE. So how does the legislation serve the dual purpose of bringing high-speed broadband to the whole country and enabling rural communities to get access to 5G? And do you see any other way for rural communities to get access to advanced wireless services without this legislation, such as through the deregulatory proposals that my colleagues on the other side of the aisle like to talk about all the time?

Mr. WHEELER. Well, let me answer that in reverse, Mr. Doyle. You cannot deregulate your way to full coverage.

Mr. DOYLE. Yes.

Mr. WHEELER. Which is not to say, by the way, that there aren't some legitimate issues, intentions that exist between local and national governments, and those can be resolved through common efforts. The fiber issue is fascinating in its—you know, everybody thinks about 5G, it is all about the airwaves. One of the reasons that China got out front on 5G is their fiber infrastructure because, in using the spectrum made available for 5G, the physics of that spectrum limit the propagation of the signal. Therefore, you have to have more antennas, and those antennas need to be connected by more fiber. And so 5G is a fiber issue as well as a spectrum issue, and if we don't have the fiber backbone, you can have all of

the spectrum in the world and you are not going to have an effective service.

Mr. DOYLE. Yes. Let me just—last question. Some people on the other side of the aisle said that the Federal Government doesn't need to invest in Next Gen 9–1–1 technologies for the systems to be universally deployed. Why is that wrong? And what will we lose if we fail to upgrade these systems in a prompt, organized, systematic fashion?

Mr. WHEELER. Well, Mr. Doyle, we are stuck with the buggywhip era, the horse and buggy era of analog 9–1–1. There are things that you could do on your cell phone that the first responders, who will have the chance to save your life or keep your house from burning down, do not have. They can't get video. They can't get pictures. They can't get precise locations. They can't get all kinds of data.

But the other fact is—and when I was Chairman, I would go out and tour Next Generation 9–1–1 operations, and I found that not only did it increase capabilities, but it lowered costs——

Mr. DOYLE. Yes. Thank you.

Mr. WHEELER [continuing]. And investment.

Mr. DOYLE. Thank you. Good to see you back, Tom.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you, Mr. Doyle.

Now I will move to Mr. Latta, to recognize for 5 minutes.

Mr. LATTA. Thank you again, Mr. Chairman.

Commissioner O'Rielly, it is great to see you again, and also I want to thank you again for coming to my district twice when you were with the FCC.

You know, it was almost exactly a year ago tomorrow that President Trump signed the bipartisan Broadband Data Act into law to update our Nation's broadband availability maps. As you know, these maps aren't completed. The LIFT Act would create several broadband grant loan programs totaling over $80 billion. The timeframes in this bill would require the FCC and States put this money out the door likely before the FCC is able to complete its maps.

What are the risks of this $80 billion being spent before the broadband maps are completed?

Mr. O'RIELLY. Well, it looks to be—your point is exactly on point—is the timeline will be dollars going out before the maps are done. Now, even if the maps are done in 4 months, you are going to have to restart the maps and restart the data collection based on the new definitions that are put forward.

I don't want to give anyone the impression that everything is copacetic, and that everything is going great or we should remain with the status quo. We still need to solve the broadband issue for those that don't have access, and the maps that you speak of are so critical, it will be completely wiped out, as I see it, by the new bill.

Mr. LATTA. Thank you.

Commissioner, followup. While there are plenty of questions and concerns about what is in the bill, I am also stunned as to what is not in the bill. Under Republican leadership, we enacted the bipartisan, bicameral RAY BAUM's Act, which included permiting

proposals through a bottom-up, regular-order process. Republicans also recently introduced 28 bills as part of the boost in broadband connectivity agenda, none of which are also included in the LIFT Act.

Would you discuss the importance of Congress enacting permanent regulatory and permiting reforms to close the digital divide and lower prices for consumers through competition?

Mr. O'RIELLY. Absolutely. I think I heard Tom Wheeler agreeing that there were some issues here that could be resolved, and relying on just cooperation in it is not going to get you there. In both the Spectrum Act of 2012 and RAY BAUM's Act, Congress came together and said, "We need to resolve these sticking points that we have identified that are preventing the extension of networks." Multiple layers, whether they be in environmental, whether they be in the permiting process, whether they be Federal ends, now exist and those are being—you know, we are facing tons of lawsuits. Every time the Commission tries to do something, it is getting sued on this exact point, and those things need to be resolved in order to move forward and get deployment to the hardest corners of America.

Mr. LATTA. Thank you.

Mr. O'RIELLY. In my opinion, to exclude them is missing a vital opportunity in this bill, whether it is all 28 or even more things that I would recommend should be included.

Mr. LATTA. Thank you very much. Thank you.

Secretary Moniz, it is good to see you before the committee again.

And the court authorized $22.5 billion for State and local governments to support projects that encourage the use of EVs. In comparison, this bill would authorize $375 million to expand development of alternative fuel infrastructure and the expanded use of alternative fuel vehicles.

With the billions of dollars of investments that this bill would make in EVs and electric vehicle infrastructure, do you think automobile manufacturers would be more likely or less likely to invest in vehicles that use other sources of fuel, such as biodiesel, natural gas, ethanol, hydrogen, or propane?

Dr. MONIZ. Well, thank you for the question, Mr. Latta, and it is a pleasure to be back with you and the committee.

Look, in my view, the reality is that we have seen the auto companies make their declarations: GM with their commitment to all electric by 2035, Ford not to be outdone, stratospheric valuations for Tesla. So I think there is no doubt that electric vehicles are going to be a very central part of our path forward.

Now, there still may be alternative fuels as well in there, particularly with plug-in hybrids, for example, but the reality is I see the EV infrastructure being invested in early as something that enables our companies, our manufacturers to go where they want to go. They have made it very, very clear. As well, what we are seeing is an enormous increase in the battery manufacturing industry in the United States. We have just heard multiple commitments made, again, Ford and GM driving much of the construction.

So I think the—I do support very strongly the EV infrastructure charging. I do think there are many challenges that have to be met, particularly with regard to social equity issues, because clear-

ly the architecture for urban environments, for suburban environments, and for rural environments, are going to look very, very different. So we have got to think it through, but that is what will allow our companies, our manufacturing companies, to follow their commitments that they have made as far as EVs critical to our future.

Mr. LATTA. Thank you very much.

Mr. Chairman, my time has expired, and I yield back.

Mr. PALLONE. Thank you, Mr. Latta.

Next, we go to Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you. Thank you, Mr. Chairman.

I want to start by just saying we have learned a heck of a lot about the need for a more robust public health infrastructure during this COVID time.

I wanted to particularly emphasize now and focus on community health centers, several of which I have, many of which I have in my district, and they are a real godsend.

So, Dr. Frieden, I am so happy to see you again. I want to thank you for all of your past service and for being with us today.

As you are aware, community health centers play a critical role in providing care to vulnerable populations who are predominantly lower-income people of color. And Black and Brown and indigenous and immigrants in immigrant communities across our country share a disproportionate burden of the illnesses and death caused by COVID and other diseases. In the response and aftermath of the pandemic, we must prioritize addressing these disparities that are so chronic in our society.

So here is my question: We know that COVID led to more severe consequences in the communities that I described. They have higher rates of certain chronic illnesses. What does the correlation between minority communities and a higher burden of COVID tell us about what we have to do about our public health infrastructure?

Dr. Frieden.

Dr. FRIEDEN. Thank you so much, and it is nice to see you and your colleagues again, Congresswoman.

I think, first, we have to look at the cause, three things: One, in the disadvantaged, underrepresented communities, you see more exposure, more underlying health problems, and less access to care and vaccination. So Black and Latinx Americans are twice as likely to die from COVID and half as likely to get vaccinated. And that is not because of resistance or reluctance. That is because of a lack of access and appropriate outreach to the communities.

So what do we need to do differently? We need a much stronger public health and primary care system. We need sustained investments. And when it comes to primary healthcare, I am big fan of community health centers. My first job was working for a community health center before I went to medical school.

But I have to say that they need to be fully supported, but they are only going to address 10 or 15 percent of the population need, and therefore we really do need to fix the way we fund healthcare so that we have an ongoing support for primary care. Primary care has to be central to our healthcare system. That includes community health centers and, as the bill has, Indian health services and others, but it also means looking at how we make sure that doc-

tors, nurses, pharmacists, physician assistants, and others can play a critical role in quarterbacking and improving care.

It is quite striking. It is not just about the minority communities. The U.S. as a whole lives on average about 4 years less. In the time we are alive, we live with more disability than other countries in Europe and elsewhere, and that is because we [inaudible] meet primary care.

Ms. SCHAKOWSKY. That is an unacceptable number that you just gave us.

I wanted to connect, though, what we are talking about to what people commonly think about infrastructure. A recent survey of health centers across the country found that capital project investment through 2025 would cost about $17.5 billion. The top areas of focus for current planning has to do with medicine, medication, mental health, et cetera.

So how do we link this to infrastructure? What are the infrastructure issues that are going to address the problems that we are facing?

Dr. FRIEDEN. So, briefly, one of them is data. Data systems need to be updated and maintained over time. Another is training of staff. So we need to upgrade the number of people. A third is actual facilities. Four, primary healthcare, community health centers and others. In addition, we need to ensure that we are strengthening not just the people and not just the informatics, but also the broader systems that collect information, surveillance or monitoring systems so we can track diseases and track the effectiveness of primary care programs, because we are not getting the kind of health value for our health dollars that we need.

So we need data systems. We need information systems that are broader than data systems, and we need the people and the places to do it right.

Ms. SCHAKOWSKY. Thank you so much, and I look forward to addressing some of these in this bill that we are discussing today.

Thank you. Good to see you, Tom. Bye.

Mr. PALLONE. Thank you.

Next, we go to Mr. Guthrie.

Mr. GUTHRIE. Thanks, Mr. Chair, I appreciate the recognition.

To Dr. Frieden, according to the American Journal of Managed Care, hospital acquisitions of physician practices increased from 35,700 hospital and practices in 2012 to 80,000 in 2018.

Further, according to a March 2021 Medical Payment Advisory Commission report, hospital access to capital remains strong due to years of relatively high pay or profit margins. The report states that access to capital, and I quote, "is reflected in significant hospital construction, in strong bond offerings at relatively low interest rates."

So my question is, given that hospitals and facilities have access to adequate access to capital, why should Congress authorize Federal funding for capital improvements?

Dr. FRIEDEN. I think what we see is in the hospital sector, you have the haves and have nots. And in rural hospitals and places that are dealing with the kind of patient population that gives lucrative reimbursement, you have real needs. But the bigger problem I want to come back to is primary healthcare. Quite frankly,

all over the world, including in the U.S., we have an imbalance where the relative funding of hospitals versus primary care is not what will maximize health, and we need that sustained investment in primary healthcare to keep people out of hospitals and let hospitals focus on the conditions that absolutely need hospital care. But if we don't invest in primary healthcare, we are never going to have enough money for the hospitals that our aging population needs.

And, remember, our population isn't just aging. We also have a high rate of obesity that increases the need for hospitalizations. We continue to have a high rate of tobacco use, which increases the need for hospitalizations. We have unhealthy nutrition and lack of physical activity so that people aren't active. All of those things result in more expensive care with not as good healthcare outcomes.

Mr. GUTHRIE. OK. Thank you.

And I will ask you a second question. In section 40004 of the LIFT Act, it authorizes $4.5 billion to support the modernization and improvement of testing in clinical labs. Would you agree that instead of creating a brand new program, Congress should work with the CDC on expanding and improving the epidemiology and laboratory capacity for infectious diseases cooperative agreements?

Dr. FRIEDEN. So I do I think the ELC, as it is called, the epidemiology and laboratory capacity, that is one of the best grant programs of CDC. It works very effectively. It has been used in a series of emergencies, and we need to build on that program over time.

I do think that laboratories tend to be the poor relation in public health. They tend to be neglected. And, quite frankly, CDC didn't get it right with the laboratory work this time around, and that didn't happen before, and we still don't have a clear public accounting of what went wrong. So I think that is needed.

During my time at CDC, when a pandemic hit, H1N1, we had a lab test approved within days. It was 1 million tests were distributed. But as Dr. Burgess indicated, it is not just about the public health laboratory system. You really have a three-legged stool. You have the public health laboratory system. That needs to much stronger, including genomics. Then you have academic medical centers that make their own tests. That is largely an FDA regulation issue of allowing them to do that. And then, commercial laboratories, which need to be given standards because, quite frankly, during COVID we spent as a country hundreds of millions of dollars for tests that came back so late that were virtually useless. And we need to tell the commercial sector, "You are great, you can move faster and at scale in a way that other sectors can't, but you have to meet these requirements for performance"—for example, results in 24 hours.

So I think there are multiple areas. But remember that laboratories do tend to be the poor relation and neglected. It took us a long time to get even a little bit of money for things like genomic surveillance at CDC and strengthening of laboratories.

Mr. GUTHRIE. Thank you. Thank you very much. I appreciate the answers to those questions.

I want to move to Mr. O'Rielly. During your time at the FCC, Open RAN is something that you worked on as well as I worked

on with several of my colleagues last Congress. Can you tell us about the benefits of adopting to a software-centric virtualized network can bring to other telecommunication networks?

Mr. O'RIELLY. Absolutely. Simply put, Open RAN can provide two things: One, it can increase the security of the network, plugging in a critical new piece of equipment by software rather than requiring an end-to-end solution through hardware. And, two, it can reduce the cost for wireless providers that are trying to deploy these networks as soon as possible and get to the technology certainly at the edges if they can.

So Open RAN has great promise. I want to be careful, though. There are some concerns, and I have been mindful of this, technology neutrality in terms of vendor mandates. We want to make sure we do it and don't cause harm by doing so. But Open RAN has quite the promise.

Mr. GUTHRIE. Thank you. I yield back.

Mr. PALLONE. Thank you.

We are going to go now to Mr. Butterfield.

Mr. BUTTERFIELD. Thank you very much, Mr. Chairman. Let me say good morning and good afternoon to my colleagues. It is good to see all of you today. And thank you to you, Mr. Chairman, for your leadership. Thank you for this very, very important and enlightening hearing today. And last, but not least, thank you to the witnesses. It is good to see all of you again.

You know, Mr. Chairman, as you have heard me say over the 14 years that I have been on this committee, I represent a rural district in eastern North Carolina where some communities still today, 2021, lack access to high-speed broadband that has become so necessary for us to participate in the modern world, especially since we have had the pandemic.

Qualified broadband providers are being discouraged. They are being discouraged from participating in FCC programs that could expand broadband access into these underserved and unserved communities. These communities are—they are outdated. There are inconsistent eligible telecommunication carrier requirements that we have to deal with. The ETC requirements are out of date, and they need our attention. In addition to expanding access, removing the ETC designation will spur competition, in my opinion, improve both efficiency and quality of service for consumers.

So last Congress I introduced the Expanding Opportunities for Broadband Deployment Act, a bill that would retire this unnecessary restriction so that providers will no longer have to wait for State-by-State approval to participate in the FCC's lifeline and broadband deployment program.

Similarly, the funds included in the bill before us today for broadband buildout across the country do not require an ETC designation for their use, and so I will introduce, Mr. Chairman—reintroduce this bill very soon, and I intend to work with my colleagues on this committee on both sides of the aisle toward passage. I am pleased that the ETC requirement is not included in the LIFT America Act, because retiring the ETC designation requirement is critical. It is so critical to reducing variance to broadband deployment.

So in the little time that I have left, Mr. Chairman, I am going to start with Tom Wheeler. It is good to see you, Mr. Chairman, again. I remember the first time you met with a small group when I came on to this committee. At the end of the meeting, I approached you and told you that you were one of the few witnesses that we had that I understood 100 percent of what you said.

So often it is above my head and sometimes I can't get my hands around it, but you have such clarity.

Chairman Wheeler, I understand that you tried to address the ETC issue in the lifeline program and, Commissioner O'Rielly, I understand that you have written about this as a barrier.

Could each of you, starting with Mr. Wheeler, talk a little bit about that?

Mr. WHEELER. Mr. Butterfield, thank you. It is great to see you. And I am reminded of that quote of Robert Browning: "To have great poets, there must be great audiences."

Mr. BUTTERFIELD. Yes.

Mr. WHEELER. But I think that this is a situation where Commissioner O'Rielly and I could be in violent agreement that ETC doesn't make any sense anymore. And it is a legacy of the fact that we are dealing with a telephone program that wasn't designed for broadband.

You are right, I tried to do something about it when I was Chairman. Unfortunately, I couldn't get a majority of the votes to do it. But it makes no sense to continue ETC as one of the tests.

So, Mike, take it away.

Mr. BUTTERFIELD. Yes, Mr. O'Rielly, take it away, please.

Mr. O'RIELLY. Thank you, Tom, and I really appreciate your leadership on this issue. I completely supported your bill last go-around and will do so in this one.

Tom is right, I wasn't able to support his effort, and it wasn't because I disagreed on policy, it was with some legal matters, and that is why Congress is so actively inured, so your engagement is so critical on this point. The ETC designation no longer makes any sense, if it ever did, and it is preventing providers from participating in FCC programs and building out and extending networks in nearby areas because it crosses street lines in some instances, and that burden isn't worth the cost they would have to go through. So they don't participate, and it raises the cost.

So I think it is absolutely something that should be corrected going forward. And we have an example. The EBB program that I am in favor of and Tom has spoken about doesn't include this, and you mentioned the LIFT Act, which I have a lot of problems with, but here it is not included as well. And you will run into some problems with State regulators on this issue, but it absolutely has to be done to get rid of the ETC designation.

Mr. BUTTERFIELD. Thank you for your clarity. You are so enlightening, and for those of you, my colleagues that don't fully understand this issue, I know you can't get your hands around everything that we talk about, but if this is something that you have an interest in, we would be delighted to talk with you about it, because it is a big deal and it makes sense.

Thank you so much. I yield back.

Mr. PALLONE. Thank you.

Next, we go to Mr. McKinley.

Mr. MCKINLEY. Thank you, Mr. Chairman.

And I direct my comments to Dr. Moniz. I am looking for you again on this—someplace on here. There you go.

Listen, I have missed having you testify before us for the last few years. I always enjoyed your insight into it. Listen, I have got to say I agree with you, not including carbon capture in this bill does not make sense. It really doesn't. But since this bill—if I could direct my questions to you, since this bill begins the transition of the Federal fleet to electric vehicles by 2025, beginning of 2025, and hybrid fuels could be banned by 2050 if President Biden has his way.

So let's talk a little bit about the Federal fleet. It is about 650,000 vehicles. And according to the Journal of Power Sources and testimony we had a few weeks ago from Mark Mills of the Manhattan Institute, to acquire the critical minerals of lithium, cobalt, nickel, graphite, copper, we will need, manufacturers will need to excavate 250 tons of earth—250 tons of earth—to get enough materials just for one battery.

So just imagine what that would be over 650,000 vehicles. I did some math on that, and so, if we don't have available biofuels or hydrogen as an alternative and we have to go to electric vehicles, we are talking about a dump truck filled with dirt, just for the Federal fleet—to go around the world, a convoy around the world twice—just to get the materials we need to build the batteries for our Federal fleet.

So I am just wondering about, since the other nations are going to say we are not doing this in our backyard, we are getting it out of Chile and Colombia and other nations all around the world, how long are they going to tolerate us taking all of their raw materials and tearing up their hillsides? How long? Do you think they will continue to think that is OK?

Dr. MONIZ. Well, Mr. McKinley—and it is good to see you again—indeed, it is a very important issue, this question of critical minerals and metals and the whole supply chain. There is no doubt that we need to reevaluate this. I mentioned in my remarks that we have to look at environmentally improved mining in the United States because the critical minerals will probably go up by a factor of 10 to 100 in many cases, except that innovation will also come in. So on lithium, for example——

Mr. MCKINLEY. I would like to reclaim my time, if I could, Doctor. And I would like to get back—you and I could have more of a conversation. I have got to slip in two more quick questions, one to you and one to O'Rielly.

So let's go to the grid for a minute. The Boston Consulting Group said if 15 percent of the vehicles are electric vehicles by 2030 that we will have to have a 25 percent increase in our electric generating capacity. So once—if this mission is ultimately to get to 100 percent of electric vehicles, that means we are going to have to have 165 percent more power generated in America than we currently have today. I just—I am wondering, are we ever going to be ready for something like that?

So, in deference with the time on it, so if I could switch over to O'Rielly on this——

Dr. MONIZ. Could I just note, Mr. McKinley? I don't understand those numbers. I don't agree with them, but we can discuss later.

Mr. MCKINLEY. From one engineer to a scientist, you might be able to keep up. You know, we will see.

Dr. MONIZ. Right.

Mr. MCKINLEY. OK. Let's go to O'Rielly for a minute, please.

So I want to switch to the jobs impact. I want to understand the refineries, because if the purpose of this ultimate legislation that the administration is pushing by 2050 to ban all fossil fuel emissions, and fossil fuels, what will happen to the jobs and the refinery-driven economies of Texas, Louisiana, Oklahoma, and elsewhere? What will happen to those? What will happen to those jobs if we can't use gasoline or diesel fuel?

Mr. O'Rielly.

Mr. O'RIELLY. OK. I appreciate your question. I can speculate and would agree with your——

Mr. MCKINLEY. I know it is not your field.

Mr. O'RIELLY. It is not my field, yes.

Mr. MCKINLEY. You are an FCC guy. If we do this, what happens?

Mr. O'RIELLY. They are going to evaporate.

Mr. MCKINLEY. Thank you.

Mr. O'RIELLY. They are actually going to evaporate and not going to be addressing critical States that are so important.

Mr. MCKINLEY. That is why I want people to just slow down sometimes and think about the consequences of this. I know we are ultimately going to get to there, but to do this so quickly as we are doing right now, I don't know that we have thought about the consequences with it. So thank you very much.

And, Frank, I yield back to my chairman the balance of whatever time I have got left, Frank.

Mr. PALLONE. Thank you.

So next, we have Ms. Matsui.

Ms. MATSUI. Thank you very much, Mr. Chairman. And I want to thank all of the witnesses who are here today, many of whom I have worked with in the past. It is great to see you.

The COVID–19 pandemic has only reinforced the value of and growing demand for telehealth. This committee has made funding available to support telehealth through the FCC's telehealth program, but because of overwhelming demand just 539 of the more than 5,000 applications have been funded. Clearly, the want and need for us to properly equip our health systems is there, and providers broadly recognize the 21st century healthcare is so much more than just the four walls of a clinic or hospital.

Dr. Frieden and Chairman Wheeler, do you both agree that we should prioritize digital infrastructure alongside physical infrastructure within our healthcare system? And I would like comments from both, even though I have a lot more questions to ask.

Dr. FRIEDEN. Well, if you have a lot more questions, I will keep my answer simple. Yes. We need a much stronger, more robust digital infrastructure, and we definitely see gaps in rural areas, definitely see gaps in some central city areas.

Ms. MATSUI. All right. Thank you.

Mr. WHEELER. And I will be equally short. The answer is yes. And one of the good things that is in the LIFT Act is prioritizing into central locations in a community to make sure that they get connectivity such as hospitals.

Ms. MATSUI. Sure.

Mr. WHEELER. And that also, by the way, opens up the ability to interconnect and get beyond there to the rest of the community.

Ms. MATSUI. All right. Thank you very much.

Climate change is reshaping our country's needs. My district faces both severe droughts and devastating flooding requiring——

[Audio interruption from another Member.]

Ms. MATSUI. OK. Do I have my time here?

In Sacramento, I have been working with the CITY and Regional Water Authority on the Sacramento water bank, which will increase the region's storage and recovery capacities by more than 50 percent. Similarly, the flood agency is proactively looking at upstream reservoir modifications to increase capacity for flood protection during a severe weather event or providing water for groundwater storage.

Secretary Moniz, beyond hydropower, how do you believe we can effectively use our waterways, particularly in dry western States, to both minimize flood risk while maximizing water use for our communities?

Dr. MONIZ. Well, thank you, Ms. Matsui, and again, good to see you back here at the committee.

First of all, I might just add that broadly the need to address our whole dam system in the United States is absolutely critical, and there have been some very encouraging activities jointly between those worried about emissions for climate, those worried about conservation, about preserving ecosystems.

So I think that this committee moving forward on those issues of water infrastructure would be very important. And, in fact, of course, as you know, we have extremes that will be getting worse from drought to flood and a lot of them providing public safety issues. We saw the disasters, for example, in Michigan, in terms of some dam failures and tragic consequences.

So, in other parts of the country, I might add, the inland waterway infrastructure is also badly in need of being addressed for energy and other commodities. So I would just reinforce what you have indicated, that we need a comprehensive look. And it must be regional because the regional needs are going to be very different in, let's say, the Sacramento water basin and other parts of the country.

Ms. MATSUI. Thank you, Dr. Moniz.

I joined a bipartisan group of lawmakers who meet with the President to discuss important issues in supply chain security, including the strategically important semiconductor industry. This meeting built on the progress we had in Congress by including the CHIPS Act in the NDAA and to support American semiconductor manufacturing and R&D.

Chairman Wheeler, can you discuss the role a reliable semiconductor supply chain plays for innovation? And you have got 15 seconds to say that

Mr. WHEELER. Without it, it does not compute, right. The 2lst century and modern telecommunications and the benefits of what that delivers has been built on Moore's law, the constant improvement of semiconductors. If we have a problem with semiconductors, we have a problem writ large.

Ms. MATSUI. Right. Thank you very much, and I want to thank all of the witnesses.

I yield back.

Dr. MONIZ. Mr. Chairman, may I just add a note that the solar winds cyber event also pointed out the importance of supply chain security for our infrastructure.

Ms. MATSUI. Right. Thank you.

Mr. PALLONE. Thank you. Thank you, both.

So next we have Mr. Griffith, Morgan Griffith.

Mr. GRIFFITH. Thank you very much. I appreciate it, Mr. Chairman.

Mr. O'Rielly, I am going to ask you a couple of questions, and I appreciate all that you have done to narrow the digital divide and advocate for the truly unserved out there in our rural communities. Although hearing some of the discussion today, I am reminded that sometimes people in my district feel like they are Charlie Brown and the Federal Government is Lucy. We keep promising and we keep promising and we keep promising that we are going to do something on broadband, and we keep pulling the football away. And I think this bill does that too, although I think it is well intentioned.

And the problem is, as you have pointed out, trying to get 100/100 before we get big chunks of my district to 25/3, it is going to open up the areas where some—a lot of companies are going to put the money into servicing areas that already have some broadband. We don't have any in many parts of my district. In fact, as it would be timely, The Roanoke Times ran an article this weekend by Amy Friedenberger on March 20th—that would be Saturday—"Can Starlink solve Virginia's broadband challenges?" And it talks about a Mr. Markham, who has called Verizon every couple of years about getting internet cable to his household in Kohala in Wise County, Virginia, and the answer is always the same: They will get it there for $23,000. That is one household. That is not a cul-de-sac. That is not a community. That is one household. And, obviously, it is too expensive for Mr. Markham's family to do that.

The Governor's team, Governor Ralph Northam's Chief Broadband Advisor, Evan Feinman, says that, you know, there is a lot of things that we can be doing. They are a little uneasy about doing the satellites, but there are 300,000 locations in Virginia, mostly in southwest—that would be mostly my district—and south side, part of which I represent, and then the tidewater region that don't have broadband access. And the Commonwealth has been pouring dollars, more and more dollars all along.

And another constituent, Mr. Short, lives about 600 feet away from relatives who have broadband through Comcast. Now, I am not sure it is 100/100, but he has got something. But for him to get it to his house 600 feet away, it is just too expensive.

I fear that we are going to eliminate services like Starlink or their competitors down the road, as they come on board, from being

able to provide in some of these rural areas, and right now it looks like they might be—when they get all of their satellites up, they might be able to service a big chunk of the territory. But it doesn't look like they are going to be able to do it necessarily in a cost-effective means. But I am not sure they get to the 100/100.

Do you know about that? And do you think, as you said earlier, or do you believe that this is part of why it is going to intensify or widen the divide between those who have broadband and those who don't?

Mr. O'RIELLY. You are absolutely right on the point that parts of Virginia do not have broadband. I visited them myself. I have represented different members over my timeframe in my career.

The cost of construction to areas such as that you represent are higher than they are to other places. So the dollars, if the LIFT Act were to be enacted, would shift to other places. So we would not deal with the communities that you represent. The dollars would go elsewhere. It doesn't mean that eventually they couldn't get to your point, but every time we kind of get to that point to deal with the absolute people who have nothing today, we move the goalpost. We did it when we were at 4/1. We did it when we were at 10/1. We did it when we were at 25/3. And every time we get close, we get into the population that has absolutely nothing. And I have sat in those kitchens and talked to the people. You represent a lot of those folks.

That is absolutely a big, big problem, and that is why my point was get everybody to 25/3 before you figure out how to shift the agenda.

But your points in term of satellite: I am a big fan of satellite. It has got a critique, and a lot of people disagree with the satellite, and I like Starlink and what they are able to do. In terms of 100/100, I can't promise you any speeds. I don't think they would promise you any speeds. But I know when I did a demo, we got 150 down. We didn't get 150 going up. The upload speed is what I've been criticizing from the LIFT Act. I don't think it matches up with reality. You don't need synchronous——

Mr. GRIFFITH. All right. Quickly, because my time is running out: For folks back home who might think 25/3 is nothing, what can you do with 25/3?

Mr. O'RIELLY. You can do everything that is being done today under the pandemic almost everywhere. I was criticized for my speeds in the Senate hearing, and I will tell you, I came back and tested my speeds. I am at 30. I am 30 in my household, and I can operate my business, my wife's operating her work. There is a lot of things that can be done with 25/3——

Mr. GRIFFITH. So we can watch Netflix, and we can do homework, and we can do telemedicine at 25/3.

Mr. O'RIELLY. Absolutely.

Mr. GRIFFITH. I appreciate it very much.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

Next is—Mr. Sarbanes is recognized for 5 minutes.

Mr. SARBANES. Thanks very much. I appreciate the hearing, and I am a very proud sponsor of the LIFT America Act. This is a ter-

rific bill, represents a lot of collaboration by many Members and, obviously, experts who have helped to provide perspective on it.

The average American, I think when you say infrastructure to them, they tend to think of highways and bridges and tunnels. We know it is much more than that. We have talked about public health infrastructure. We have talked about broadband. We know we have to lift up the water infrastructure across the country, the electric grid, et cetera. So infrastructure means many, many different things, and the LIFT America Act is trying to address those.

Secretary Moniz, I wanted to talk to you today a little bit about the electric grid. It is an area that I have had a keen interest in when it comes to this discussion about upgrading our infrastructure. We know there's challenges. There is growing demand. There is the need for reliability.

Of course, we saw what happened in Texas recently, which was a commentary on lack of reliability under some very difficult conditions. All of that shows that we have got to adapt our grid to 2lst century requirements.

Could you talk a little bit about how modernizing the grid is a smart investment, both from the standpoint of helping to address carbon emissions as well as just promoting reliability and affordability?

Dr. MONIZ. Yes. Thank you, Mr. Sarbanes.

First of all, I think we all recognize, and it is really always important to remember, how the electricity infrastructure is like the Uber infrastructure. We saw that with Texas when electricity went down. The gas supply was suffering. There were some poor policy choices, clearly. But the interplay of infrastructures means electricity must be reliable and resilient, especially as its role in society grows with the electrification of other sectors.

As I have said before, the integration with IT being able to make near-real-time measurements in the grid will both stabilize it and provide on the distribution side new services that entrepreneurs can take advantage of.

So it will help with efficiency. It will help with demand management, which is a big part of reliability and resilience. So it will help with emissions, and it will help with the economy. It also will be a big job driver. The electricity sector is already the home to about almost 1 million workers.

Mr. SARBANES. Thanks very much.

And I am thrilled that we have included in the LIFT America Act the 2lst Century Power Grid Act, which I was privileged to work on over the last couple of Congresses. That would empower the Department of Energy to support projects and improve grid performance, security resiliency, and so forth. We have got to make that kind of investment if we are going to meet these 2lst century challenges.

Let me talk briefly about green buildings in the time I have left. And, again, Secretary Moniz, you in the last appearance before this committee, I believe, talked about investing in Federal buildings to reduce emissions, create jobs at a time when the pandemic had severely impacted our economy. Of course, that continues to happen.

Since then I have joined with my colleague on the committee Congressman Welch. We have introduced the Federal Buildings

Clean Job Act, which would invest funds and leverage private funds to make Federal buildings more energy efficient, resilient, reduce green gases, and as you were indicating in the other context, create a lot of very good jobs, creating construction, and so forth.

Secretary Moniz, with the substantial building portfolio the Federal Government has, how important is it do you think that the Federal Government get into the business of building efficiency and resiliency projects in its own buildings? And is the Department of Energy in a position to assist in this effort through programs like the Federal Energy Management Program?

Dr. MONIZ. Yes. Thank you. I think it is a very, very important initiative.

I will note that when I was Secretary we pushed very hard on energy efficiency standards, saved consumers over a half a trillion dollars up to 2030. There is no reason why the Federal Government shouldn't enjoy those same savings on its energy bills, and, so, I think advancing that is absolutely critical.

And I would just add, if I may, I strongly support the LIFT Act's focus on residential. I strongly support your focus on Federal buildings, and I would urge going further to have energy efficiency programs that support State, county, and local public buildings as well, an enormous opportunity, and often public budgets, especially in rural America, otherwise don't support those money-saving upgrades, both emissions and money-saving upgrades.

Thank you.

Mr. SARBANES. That is a terrific suggestion. I yield back. Thank you.

Mr. PALLONE. Thank you.

Next we go to Mr. Bilirakis. Gus?

Mr. BILIRAKIS. Two Greeks back to back. It is Greek Independence Day on March 25th, Mr. Speaker. So thank you, Mr. Speaker.

Mr. PALLONE. Amen.

Mr. BILIRAKIS. Appreciate it. Thanks for giving us the opportunity.

And in regards to broadband, this committee, the FCC, and the private industry spent years and tens of millions of dollars, as you know, on broadband so we could get funds to the truly underserved and stop wasting by needlessly overbuilding our areas. The LIFT Act ignores all of that work, in my opinion. Rather, it allocates upwards of $100 billion to deployments that unnecessarily move the goalposts and target it to areas that are already served.

And I know that that my good friend from Virginia mentioned this, and I know there are a lot of people that face this issue, the same issue. I am sure many of our colleagues, as I said, in these areas are livid. They will never see broadband if there are more populated areas eligible for funding. And this legislation will only widen that digital divide. And I recommend that we—and I strongly suggest that we address this issue, Mr. Chairman. Meanwhile, my constituents will continue to pay for the failed results.

A better impact on underserved areas is removing regulations that prevent effective market participation. Consistent requirements will help small businesses and startups compete and grow in these areas. And then we can leave the funding—again, we don't want our constituents paying, and we need to leave the funding to

the truly unserved areas, and I really feel like everyone agrees with that. Everyone could get the help they need, all of our constituents.

So my question is to Mr. O'Rielly related to regulatory burdens and past experiences. What are the lessons learned from the FCC's RDOF auction as the broad participation by providers means more consumers will be served with far less funding? What can be learned from that experience as we prepare for the second round of RDOF?

Mr. O'Rielly.

Mr. O'RIELLY. Yes. I appreciate your question. I think you set it up quite nicely. You are absolutely right that the RDOF had wide participation, and we had a number different of technologies that were able to be part of it. And if you look at what, you know, is contemplated in this bill, I think I have—and other people have said it—it is just about fiber and every other technology pretty much gets ignored by moving the goalpost, as you indicated, and so I think that is incredibly problematic.

As we get to RDOF phase 2, that really comes down to having the maps done, and hopefully, the maps—as I understand it, they are going to be done relatively quickly. But if you move the goalpost on the first part, then the maps unravel and you have got to restart the data collection or you have got to try and figure out how to recontain that and repopulate it for different purposes, and you restart that timeframe.

So I disagree with doing that because then you just—you don't get to RDOF phase 2. You don't get to those areas. And these are the areas—not the hardest to reach, not in terms of we know there is absolutely no one in a block. These are the places where they are partially served blocks.

There is a house or a location or in many locations, but part of the block is not being served, and how do we deal with that? And that is having accurate maps, and it is not by moving the goalposts.

Mr. BILIRAKIS. Thank you.

I want to yield the rest of my time to Mr. Griffith if he would—Morgan, would you accept that? OK.

Well, thank you, Mr. Chairman. I hope that in the end, this is a bipartisan bill because as you know, we are famous for bipartisanship in this committee. And for it to become law, of course, we need the other chamber as well. So thank you very much for the input. I yield the rest of my time to Mr. Griffith.

Mr. GRIFFITH. Thank you very much. I appreciate it, Gus.

Mr. Moniz, you and I have discussed in the past the importance of the U.S. maintaining its leadership in clean fossil fuel technologies because coal will be around globally for decades. As you note in your testimony, carbon capture utilization and sequestration will play an important role in the future. How important will permiting reforms be in getting CCUS projects off the ground?

Dr. MONIZ. Yes. Thank you. There is no question that I remain convinced, and many others like the International Energy Agency, that carbon capture and sequestration will need to be a central technology complementing renewables and nuclear and others.

The permiting issue, you put your finger on one of the major issues. A CCS project can be very complex in terms of its permiting requirements at Federal, State, and often local levels as well. So what we need is at the Federal and at the State levels, ways of streamlining, not short cutting, but streamlining the permission process. We looked very carefully in California as one example, and we found that there were multiple permiting requirements that were not being pulled together coherently, and that was a major obstacle to getting projects done. So a very, very important issue.

Mr. GRIFFITH. I yield back to Mr. Bilirakis.

Mr. PALLONE. Thank you.

Mr. McNerney is next.

Mr. MCNERNEY. Well, I thank the chairman. I thank the witnesses. It is great to hear you all and see you all again.

Mr. Wheeler, my Republican colleagues tend to focus on deregulating the infrastructure signing process and taking away the local authority, believing that this is the silver bullet that will bring broadband to everybody in the country.

Please, with a yes or no, Mr. Wheeler, will this approach get us to a universal high-speed broadband access with the option to every American in this country?

Mr. WHEELER. The way you outlined it, the answer is no.

Mr. MCNERNEY. OK.

Mr. WHEELER. There are—the problem is, Mr. McNerney, one thing is that each side comes in. The industry says, "This is my wish list, I want all of this." Some folks come in and say, "Not in my back yard, I want all of this." We need to be working to how do we get to common ground.

Mr. MCNERNEY. OK. Well, thank you, Mr. Wheeler.

My district includes the City of Stockton. It is kind of close to Silicon Valley, but it is very different. It is a low-income area. A few years ago, the city wanted to build an open-access, fiber-based broadband network, but the startup the city was relying on went under and the project wasn't able to move forward.

Now, I recently introduced the Broadband Infrastructure Financing and Innovation Act, BIFIA, now included in LIFT, that would provide $5 billion in Federal funding for low-interest financing of eligible broadband infrastructure deployment projects.

Can you explain, Mr. Wheeler, as briefly as possible, why the BIFIA program would help for open access projects like the one the City of Stockton was hoping to do?

Mr. WHEELER. Well, BIFIA opens up for multiple uses, but for instance one of the uses that it could be put to is funding the middle mile to connect to the Stockton project, funding the Stockton project.

Let me—this is apropos of that. I need to correct something that Commissioner O'Rielly has now said twice which is incorrect, which is how the maps have to be redone. What we are talking about when we are talking about "maps," quote/unquote, are not maps. This is not an atlas that you take off the shelf and turn to a certain page. This is a database.

This has to be a quasi-real-time, ongoing database that matches the lines of the companies and 160 million residences and businesses and keeps evolving. It is not a frozen document. That capa-

bility is what needs to be available and I believe will be available at the time that the Congress makes the funding available, and that is important for BIFIA.

Mr. MCNERNEY. Thank you. Well, in your testimony, you stated that the other great failure of our national policy is how low-income Americans may have broadband passing through their front door—in front of their front door—but don't bring it inside. This is the case for too many of my constituents. They either can't afford it or they don't have the digital literacy skills.

I introduced the Digital Equity Act with Representative Clarke, also included in LIFT, would be used to fund a wide range of digital equity projects. In a few sentences, please, why is it critical that we address gaps in broadband adoption and broadband literacy?

Mr. WHEELER. So Pew did a great study on why people who could, don't subscribe. First, about half of them was about cost, but there was also understanding, fear, lack of equipment, and intimidation. One of the great things that the LIFT Act does is to—and your bill does is to move to the States the opportunity to work with the people that they are closest to to help overcome some of those obstacles.

Mr. MCNERNEY. Thank you.

Dr. Moniz, it is great to see you again, and I am glad that you are continuing in the field.

In your testimony, you highlighted cybersecurity as it relates to energy infrastructure. This is something I care a lot about. How concerned should we be about the growing cyber threats to our Nation's grid infrastructure?

Dr. MONIZ. Well, I definitely think we should be concerned. Mr. McNerney, by the way, good to see you as well. Again, for example, the solar winds event, as I have already said, really should catch our attention. It was undetected for so long. It was found only because it wandered into one of the cybersecurity companies, and it has certainly penetrated the cloud. And I am not sure we even know today exactly what all of those issues are.

So I think the Department of Energy is doing a good job, actually, with its ESEC process, but the issue is in the utility space. There are clearly very variable capabilities.

So I think that the Department and the Department of Homeland Security could really increase their assistance, especially to some of the smaller utilities that don't have quite the capabilities of the large IOUs.

Mr. MCNERNEY. All right. Thank you.

Dr. MONIZ. And I might add not only for the electric grid but also especially for the interactions and interdependencies, for example, with the gas grid.

Mr. MCNERNEY. Certainly. Certainly.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

Representative Johnson, Bill Johnson, is next.

Mr. JOHNSON. Thank you, Mr. Chairman.

Mr. O'Rielly, it is really good to see you again. Thanks for being with us today. You know, Chairman Wheeler in his opener said in reference to the Lifeline program that a law designed for tele-

phones doesn't work for broadband. This demonstrates his extreme ambivalence on these important issues because he has consistently advocated for regulating broadband under those old laws, to regulate them as a utility.

So do you agree that laws designed for telephones doesn't work for broadband?

Mr. O'Rielly.

Mr. O'RIELLY. Yes. I would agree that we shouldn't use old statutes that aren't applicable for these purposes. I have supported Lifeline in the past. I think we should migrate away from that. Something like an EBB makes a lot more sense or something that Tom was talking about on affordability, but your point is very well taken. He wants the positives and not the negatives.

I do want to address the one point he made in terms of maps, and I apologize for using up some seconds of your time. The maps are static, and they reflect what it looks like at a given moment. The data is not coming in on a constant basis, so new houses that are or new locations that are deployed are not constantly populating into the commission database. It is not something that is living and breathing. It is something you could make to do that, but that would be incredibly burdensome on the providers to do so.

And so when I am suggesting the maps need to be done, it is the data that may have to be recollected or at a minimum the data that is there will have to be reanalyzed and set to these new standards. And I apologize for using your time.

Mr. JOHNSON. That is OK. I have heard that if new programs open up to eligibility to areas that lack service at 100 megabits per second upload and download, more than half the country would be considered unserved, which means that funding is now eligible for half the country. That sounds like the exact opposite of what needs to happen to target funding to truly unserved areas.

If broadband funding is available in areas that don't have 100 megabits per second symmetrical service, doesn't that mean that the funding is most likely to be used for upgrading places that already have broadband while rural consumers continue to wait at the back of the line to get service?

Mr. O'RIELLY. Absolutely. The dollars will flow to those areas that are easier and cheaper to upgrade and provide a greater return on investment. And I have been to your district, and I have seen how hard the geography is. I have seen the mountainous regions and how you have many of your consumers and many of your constituents who would be happy to have broadband at 25/3 who have nothing today. I remember being at the school. It had no wireless connection in your district. And so when people say we want 100/100, I am very mindful of the areas that I have visited such as your district and how they and many consumers have nothing. They are at the back of the line.

Mr. JOHNSON. Well, I know you are kind of alluding to it. You are kind of alluding to it. So what does that mean for digital equity? It seems like that would be going in the wrong direction.

Mr. O'RIELLY. I would think so. I would think that the hardest-to-reach parts of rural America will take longer to implement, and we will have to see if the dollars stretch as far as they want to, depending on what is the funding level. But the priority will be the

other areas that are easy to serve. And the consumers, in terms of equity, I would suggest the consumers that have been left off before will continue to be left off.

Mr. JOHNSON. OK. Continuing with you, Mr. O'Rielly, the COVID–19 pandemic shined a really bright light on the devastating impact of social isolation, particularly with our senior population. Everything from remote working, distance learning, the need for telehealth, nowhere was that seen more clearly than in our Nation's senior care settings.

So do you agree that investment should also be made in broadband connectivity for senior care facilities? Not only would this investment save the healthcare system critical dollars in the future, but it could ultimately save lives should safe isolation be required in the future. What do you think?

Mr. O'RIELLY. Well, you make a lot of sense. I haven't analyzed the cost of doing so, and that is something that you have in your capable hands, I don't have in mine in terms of policymaker, but it makes a lot of sense. My mom's in a center today, and broadband was very critical to try and keep her connected as she has some serious health issues.

Mr. JOHNSON. Well, I am sorry to hear that about your mom, but I absolutely believe we have got to be very, very careful on all of these issues that we are talking about, the unintended consequences of going 100/100 symmetrical and what that will do to locking out rural America and especially with seniors that live in rural America that really enjoyed the expansion of telehealth. And I really appreciate my colleagues like Doris Matsui that has worked with me so strongly on telehealth issues. Thanks, Mr. O'Rielly.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

The next Member is Peter Welch. Peter, you are recognized.

Mr. WELCH. Yes. Thank you. Pardon me. Thank you very much. I have some quick questions for an incredible panel. I really appreciate every one of you.

Dr. Frieden, I want to go back to you. I totally am in support of your view that we have to have regular and steady funding for public health and for primary care. I want to ask a question. I am truly shocked at the failure of our Congress, Republican or Democrat, to start addressing the extraordinarily high cost to healthcare in our country. It is brutal. It means that taxpayers are hammered, employers are hammered, and so are individuals. Workers lose wages.

Is it the right way to go that we just put more money into a place where I do agree we need it, primary and public health, without addressing what I regard as the totally out of control and unsustainable cost in the healthcare system?

Dr. FRIEDEN. Well, if I may, Congressman, I will enter into the record two articles I wrote just 2 weeks ago published about this very topic. I think we can control healthcare costs. It is shocking. We pay more for less life expectancy, for more disabilities than any other country in the world, and there are ways to fix that. Those include a payment system that rewards health, not volume of care.

[The articles are included with Mr. Frieden's prepared statement.]

Mr. WELCH. Right. I agree with that. I will distribute those articles to the committee with the Chair's permission, but thank you.

Second. Secretary Moniz, very good to see you. I just want to report that those tight, small tiny homes that you visited, they are doing great here in Vermont. Super energy efficient.

Dr. MONIZ. Great.

Mr. WELCH. Mr. McKinley and I had Hope for Homes—it had been helpful in the past—that would provide incentives to homeowners, $2,000 if they did retrofitting that reduced by 20 percent what the energy consumption was, $4,000 if it were 40 percent. Do you continue to advocate as one of your comprehensive approaches strong commitment to energy efficiency that creates local jobs and saves on carbon emissions and saves people money?

Dr. MONIZ. Absolutely. It is the best investment we can make, and typically we do see typically north of 20 percent energy savings, so it is great. As I said earlier, I would even like to expand it further to other things like local and public buildings and the like for energy efficiency gains. But starting with residential certainly is——

Mr. WELCH. Thank you. Yes. And we have had some good bipartisan support on that.

Mr. Wheeler, you know, I listened to Mr. O'Rielly, and actually I take quite seriously his cautionary observations because, when you have a big program and you can get money out, there is an excitement to just, quote, "get something done." But my understanding of what we are doing here is essentially making the public decision in LIFT America Act that was made in the 1930s with electricity. We have to have high-speed broadband.

First of all, is there a reason that we would not want to have symmetrical speeds in rural areas just as when in the 1930s we didn't have a different kind of second-rate electricity that couldn't keep up with the progress that was being made? Can you address that?

Mr. WHEELER. Thank you, Mr. Welch. I am at a loss as to why there ought to be second-class service for anyone, particularly when 80 percent of America can get a gigabit. But there is a misassumption that has percolated through this discussion about this back-of-the-line business.

The 2017 study that we did that said how much would it cost to build fiber to every home—every home, not just those that are picked and chosen, every home—was $80 billion. And if I am the CEO of a small telephone company in Vermont and I have got an unserved area next to me that I would like to get revenue out of, and the Federal Government says to me, "We will pay you a subsidy to build that out to urban-quality standards," and I say no to that, I ought to be fired. And my understanding of what LIFT does is like our 2017 study that says this is what it takes to connect everybody to urban-quality broadband.

Mr. WELCH. Thank you very much. I yield back. My time is up, but I thank all the panelists. They were terrific.

Mr. PALLONE. Thank you, Mr. Welch.

Next is Congressman Long, Billy Long.

Mr. LONG. Thank you, Mr. Chairman, and thank you all for being here today. And before I start my line of questioning, I would like to paraphrase something that Ronald Reagan once said. He said that the trouble with our liberal friends is not that they are uninformed, it is just that they know so much that isn't true, and I think something that was said earlier by Mr. Doyle kind of falls into that category.

Mr. Doyle said that—he made kind of an accusation about NextGen 9–1–1, that Republicans, you know—what he said, you know, that us not being supportive and whatever, but Republicans were very supportive of moving forward on NextGen 9–1–1, and we were working diligently with our Democrat friends. We really, really were. And we were working in earnest until they walked away, literally, the night before they dropped the LIFT Act. So I think that is more accurate of what actually happened here.

I have a question here for Commissioner O'Rielly. This legislation, the LIFT Act, tilts the preference for the Federal money towards projects that will delay open-access broadband service networks. If an area already is so uneconomic to serve that it requires government subsidies to sustain even one provider, what are the impacts of favoring projects in this way, and is that an efficient way to use Federal dollars?

Mr. O'RIELLY. Well, it is going to make the cost of those networks more expensive. It may introduce, you know, potential competitors to an area that can't support them, and that becomes, you know, uneconomical, depending on the provider.

But I do need to respond to Tom's previous point. I didn't suggest that they wouldn't get—that the rural areas today wouldn't be addressed. I said that they would be addressed later because the earlier, the easier areas would be tackled first. And it is one thing to talk about a small company in Vermont. It is another to talk about larger companies that serve greater areas and where they are going to upgrade first and where the dollars are going to flow, and that is my point that he seems to miss.

Mr. WHEELER. Well, the dollars flow to the unserved areas, Mike. You set the standards, and then they flow.

Mr. LONG. It is my turn. It is my time.

And I am concerned that some of the funding conditions on the preferences in this bill such as State regulation, open-access requirements will mean that fewer qualified broadband providers will apply for the funding. And still with Mr. O'Rielly, isn't that the opposite of what we need to serve rural America, much of which I represent here in the Seventh District of Missouri?

Mr. O'RIELLY. I would absolutely agree.

Mr. LONG. And what changes do you suggest to make to this bill to be more effective to close that digital divide that we hear so much about?

Mr. O'RIELLY. Well, I would focus on a laser perspective on those that don't have service today, 25/3, figure out how to get them, and we already have programs that are working. We need to finish the work that the Commission is doing. That means upgrading the maps and dealing with the programs.

If additional funding—I wouldn't put $80 billion for it. I think that the ecosystem can't handle it, and I would say that the sym-

metrical speeds that we have been debating don't make any sense. And it is not because I want one part of the population to have—another part of the population have less. It is that you don't need 100 and 100, and you don't need symmetrical speeds for the current activities and even the growth of the current activities. So to go to symmetrical speeds makes no sense, in my opinion.

Mr. LONG. Yes. The LIFT Act includes an additional $6 billion for emergency broadband program subsidy. Congress authorized $3.2 billion at the end of last year in a bipartisan manner in response to the COVID–19 pandemic, not for a permanent subsidy program, and that program is not yet up and running.

What are some concerns about Congress authorizing more money for a program without first understanding what the need is, especially as we restart opening schools and our economy with the new CDC guidelines saying 3 feet of social distance is sufficient?

Mr. O'RIELLY. Well, that—look it, I think the program, you know, get it up and running, and figure out where the problems are and if it is working before you add—you know, double its cost or double the amount of money going for it. I mean, if you compare it to Lifeline, which maybe is running last year maybe $800 million, this is four times as large as the money that Congress has already appropriated on a bipartisan basis and then add another $6 billion. I would just say get the program up and operational and figure out the problems before you add new money, but that is for you to make the decision.

Mr. LONG. OK. Well, I appreciate that.

And with that, Mr. Chairman, I yield back.

Mr. PALLONE. All right. Thank you, Billy.

Next is—Paul Tonko is recognized for 5 minutes.

Mr. TONKO. Thank you, Mr. Chair.

I want to quickly highlight a couple of provisions that we might call environmental infrastructure, but I think we will see these are as critical to job creation and our economic growth as anything in this bill.

So, Dr. Frieden, forgive me if this is a little beyond the scope of your testimony, but how important is safe drinking water to our Nation's public health?

Dr. FRIEDEN. Safe drinking water is very important, and it is one of those areas of infrastructure that hasn't been adequately supported. There are significant problems in urban and rural areas, places ranging from Alaska to Florida, and it is a problem that is likely to increase because of changes in our environment.

Let me just make one broader comment, if I may. From my perspective, having been a city health commissioner and working in my organization more than 40 countries around the world, most governments have a capital budget and an expense budget. The U.S. Government doesn't have that. If we had that, investments in infrastructure would be much easier to maintain, but I certainly agree that drinking water is crucially important for health.

Mr. TONKO. Well, thank you. And so if we improve water quality by investing in treatment facilities and getting lead pipes out of our systems, will that have a positive public health benefit?

Dr. FRIEDEN. Absolutely. The lead service line replacement issue is one that has really stressed public health for decades. The cost

is high to replace them. And it is an example of what happens if a technology that is used turns out not to be safe. But the sooner we get lead down, not only will we have less health problems, but the societal and economic benefits of reducing exposure to lead are quite substantial.

Mr. TONKO. Well, you say the cost is high, but then is it safe to say we will create jobs building that infrastructure?

Dr. FRIEDEN. The actual act of—the actual work of replacing the lead service lines will be an employment generator. In addition, there is strong evidence that suggests that lower lead levels are associated with higher economic productivity and activity in the people who are no longer having their brains poisoned by low levels of lead.

Mr. TONKO. Thank you very much.

Secretary Moniz, great to see you. This bill also has money to remediate formerly used industrial sites known as brownfields, many of which are good candidates for renewable energy projects. Is putting brownfields back into productive use a good investment?

Dr. MONIZ. It certainly is, and it also often has very, very strong environmental justice components as well. One of the approaches that I particularly like for brownfields is community solar because often, especially in disadvantaged communities, there aren't roofs to put solar panels on in any practical way, for example. And community solar is a wonderful way of serving these communities using brownfields, perhaps a couple of megawatts at a brownfield site. Also, when done well, employing some of the local citizens in those projects.

Mr. TONKO. Thank you. And the LIFT America Act also makes significant investments in zero-emission vehicle infrastructure, including a bill that I authored to provide rebates to build charging stations to workplaces, multifamily apartments, and publicly accessible locations. So Secretary Moniz, we know most EV drivers primarily charge at home. But as more people adapt to EVs, will it be important to provide more charging options?

Dr. MONIZ. Yes. In fact, we are doing a study in New York City, and just basically in the center of New York City we see the need for about a half a million charging stations. But, of course, urban environments, suburban environments, and rural environments will need very, very different architectures. But we need them all because it has to be an integrated system were people with EVs have the confidence to be able to drive as they need to, whether it is for work or for pleasure or for vacation and the like.

Mr. TONKO. Thank you. Are workplaces in publicly accessible locations such as grocery stores and public buildings good complements to ongoing EV infrastructure buildout for at-home charging and fast charging along long distance and interstate corridors?

Dr. MONIZ. It is absolutely essential because otherwise we will be limiting the market when we know that EVs are already economically competitive with internal combustion engines. So it would be the height of unfairness, frankly, to exclude the charging infrastructure to those who could benefit from those vehicles with their lowering costs.

Mr. TONKO. Thank you so much.

With that, Mr. Chair, I yield back.

Mr. PALLONE. Thank you, Mr. Tonko.

Next is Dr. Bucshon.

Mr. BUSCHON. Thank you, Mr. Chairman. I appreciate it.

This committee has a strong history of working across the aisle, crafting real and helpful legislation for the betterment of the American people and consumer. This partisan bill expands authorizations leading to massive taxpayer spending during a time when Americans are trying to return to normal life, and I think that is unfortunate.

Two Congresses ago I had a bill, H.R. 2872, the Promoting Hydro at Existing Nonpowered Dams Act, that became law. This bipartisan legislation created real-world change for the betterment of the American people. It cut through the red tape and instructed FERC to create an expanded permiting process.

The clean energy resource provides benefits in the form of jobs, economic investment, and improved public health. EIA reported that, as of December 2020, 39 nonpowered dams and 305 megawatts of capacity are planned for commercial operation as a result, which is an increase from 2018.

The United States has been a leader in reducing its emissions, and in order to continue that leadership, advancing technology and innovation is key. However, this legislation lacks any meaningful permiting or licensing reforms to remove barriers to deploying new technologies, thus, in my view, stifling innovation.

Instead of rushing to yet another partisan costly and duplicative package through the process, we should all be working with the Biden administration to implement the appropriations from the Energy Act of 2020. The bipartisan provisions included $35 billion of R&D and grants and technical assistance programs for developing and deploying clean energy and reducing emissions.

Let's work together on bipartisan bills that actually improve our Nation's infrastructure, provide greater broadband access to rural America, pave the way for reliability and resilient electrical grid, and make electricity affordable for all Americans.

With that in mind, Commissioner O'Rielly, are you aware of anything in the bill that will actually cut through the bureaucratic red tape and allow for a more streamlined permiting and licensing process, which will lead to greater innovation and more efficient broadband buildout?

Mr. O'RIELLY. On the communication side, those provisions didn't seem to make the cut as of yet. But I have endorsed the package that is 28 different bills, and there are more ideas that should be included. It is not an all-or-nothing thing.

I think my colleague, my former colleague, has suggested that we are trying to deregulate our way to network build, and that is not right. But they are a critical point to reform and they need to be addressed, or all you are going to get is litigation, which we have dealt with and the commission has tried to deal with for such a long time. And these problems need to be addressed and should be addressed here in this bill.

Mr. BUSCHON. Let me just say as far as my bill, the hydro bill goes, we went from a process potentially of 10 to 12 years to convert a nonhydroelectric dam to a hydroelectric dam, and our bill has cut that down to about a 2-year process and it hasn't taken

anything offline as far as the review process. It has just forced FERC to actually make a decision and to get the decision—up or down, to get that decision out there.

So I firmly believe that, unless we do those things, we can have all the programs we want, but if it takes 10 or 12 years or longer to develop any kind of infrastructure project, what part of the private sector is going to play with us, play in that ballpark, right? They just can't. They just can't do it economically.

Also, Commissioner O'Rielly, in light of broadband funding, subsidies from the FCC's USF program, USDA, and now the Treasury Department allowable use funds to States, what modifications to the new FCC program proposed in the LIFT Act do you think are needed to ensure broadband companies can meet the obligations of this program in light of other programs potentially subsidizing the same areas?

Mr. O'RIELLY. Well, I think you are going to have overbuilding of Federal programs. And I am just unclear how that is going to work, how the $80 billion in the LIFT Act—or the LIFT America Act—would operate when you just put—when Congress just put all of this money through these other funding sources for different standards. I just don't know how that is going to be coordinated.

First of all, the coordination is poor, but even then I don't even know how these would act. And I would say that the LIFT Act seems to wipe away most Federal programs through the FCC programs in favor of its own.

Mr. BUSCHON. Yes. I mean, you know, the Federal Government has a tendency of putting a lot of money out there that people actually can't use, you know. I mean, this is common across the Federal Government. We do that to the agency—we do that to parts of our economy all the time.

It seems to me that we want to ask people who are actually in the game, "Hey, what actual amount of money do you need to do what we are proposing, we are asking you to do?" And so my concern is, as is yours, is that this kind of funding is—it may not actually be necessary, or they can't use it.

I represent a very rural district—I just want to say this in closing, Mr. Chairman—and broadband access is critical. You can't have economic development, you can't do telehealth medicine, and you can't do distance learning if you don't have it.

So I am hopeful whatever we do here in Congress that we find a bipartisan solution to that problem.

I yield back.

Mr. PALLONE. Thank you.

Next is Congressman Cárdenas.

Mr. CÁRDENAS. Thank you, Mr. Chairman. I would like to thank all the Members for attending this important hearing, also to the ranking member.

It is our responsibility as we build for the future to provide a safe, sustainable environment for everyone today, especially for our children and grandchildren and future generations. In Los Angeles, we continue to work on reducing emissions so we can breathe cleaner air. That includes investing in our public transportation, which will greatly benefit families in the San Fernando Valley and throughout the region. The LIFT America Act includes language

from my bill, Clean Commute for Kids Act, language that will help provide communities with zero-emission schoolbus fleets.

There are nearly 500,000 schoolbuses across our great country. Nearly 95 percent of America's school buses run on diesel—yes, diesel—a fossil fuel that has been shown to cause numerous health problems, including asthma, bronchitis, and cancer. And the most vulnerable among us are our seniors and children when it comes to health effects of things that cause cancer.

Transitioning to cleaner buses would prevent the release of 5.3 million tons of greenhouse gas emissions each year to protect our children and their lungs and to keep our diesel fumes out of the air and inside of our schoolbuses and also to have a better benefit for the world at large. The LIFT America Act puts our goal to transition the entire fleet to zero-emission buses over the next decade. This is the most aggressive attempt for us to do the right thing in America for our children and for the environment.

Secretary Moniz, transitioning to clean schoolbuses includes the cost of the bus, which is currently around $300,000 each bus. The cost of buying and installing charging infrastructure and the cost of training employees in the new technology, the LIFT America Act authorizes grants for all of these costs and also includes strong Buy America language for the schoolbus program.

LIFT America authorizes $650 million over the next 5 years to begin this transition, but recently the World Resources Institute wrote a letter noting that this amount would definitely not be adequate.

Mr. Secretary, would you agree with me that Congress needs to commit significantly more funds if we are trying to transition the fleet over the next decade?

Mr. MONIZ. I would, sir. The electric buses are having their costs come down rapidly. Charging these fleets is a natural, and frankly, there would be some environmental justice benefits as well in many, many cases.

Mr. CÁRDENAS. OK. So it is multiple benefits, not just the children.

Dr. MONIZ. Yes.

Mr. CÁRDENAS. How would—yes. And how would a significantly higher financial commitment from the Federal Government paired with the Buy America requirement influence the private sector's decisionmaking regarding investing in manufacturing capacity here at home, including for components like batteries?

Dr. MONIZ. We need to really up the game in our supply chain for these vehicles. Right now, electric buses are dominant in China. We would like to get a domestic supply chain here for the vehicles and for the batteries.

It is encouraging on the battery side that we are seeing many new battery factories going up to serve the EV, the light-duty vehicle market. But, of course, they would also serve the electric bus market.

And the bus market has not only the schoolbus market but, of course, urban buses would also be quite natural if we can build our supply chain.

Mr. CÁRDENAS. Yes. Thank you. The LIFT Act also includes language from my bill the Affordable Solar Energy for our Commu-

nities Act. This language provides funding for community solar installations for underserved communities as well. Everybody who wants to have a safer and cleaner environment should be able to participate.

Secretary Moniz, in addition to helping increase access to clean energy, can you please talk about the role of small solar installations like community solar in our energy transition?

Dr. MONIZ. Yes. Again, as I said earlier, I am a big fan of community solar. Certainly in many underserved communities, there is very limited opportunity, even if you had the resources, to do a rooftop solar installation. So this way, in those communities you could in effect own a piece of a 1- or 2-megawatt facility and lower your energy bills typically.

So I think this is a major opportunity. And going back to the earlier question, it also would link in with a brownfields program.

Mr. CÁRDENAS. Thank you. The LIFT Act is something that we should move forward, and I support it wholeheartedly. And also I think that we have had the worst example of bad government when it comes to Texas and the failure for them to require redundancy in their systems and to make sure that they do not fail the people.

So with that, I will yield back my time.

Mr. PALLONE. Thank you.

And now we go to Congressman Walberg for 5 minutes.

Mr. WALBERG. Thank you, Mr. Chairman.

Let me first echo my colleagues in recognizing how deeply troubling it is that the majority has decided to forego some bipartisanship in working on an issue that we can all agree on, I truly believe, investing in our Nation's infrastructure, instead of reaching out to Republicans to find areas of common ground. There was a decision, I guess, to introduce a partisan wish list that lacks the very basic principles of good government.

While the provisions in the package appear well intended, many of them actually undermine the larger objectives that this bill seeks to address. For example, while setting lofty standards for higher broadband speeds and trying to futureproof network technology, which is a good thing, the reality is that this provision in this bill would actually drain limited resources to upgrade existing networks rather than expanding underserved areas.

I am also disappointed that there has been a decision to abandon our previous bipartisan work on NextGen 9–1–1 services. NG 9–1–1 is critical for the safety and security of our communities, yet 9–1–1 dispatchers in my district and in the State have raised serious concerns that provisions in this bill would strand millions of dollars in taxpayer investment over the last decade.

Let me start by saying that expanding broadband to rural America is vital, and as someone who was recently connected to the internet, thanks to the Connect America Fund, I understand how important it is that we use our dollars wisely. The bill——

Mr. PALLONE. Did we lose Tim? Did we lose—now I can. Now I can't. I can't hear him. Is anybody else hearing him? Now we can hear you. Go ahead.

Mr. WALBERG. We will do our best.

Mr. PALLONE. I don't know if—it appears that you have lost me again. Now we can hear you again.

Mr. WALBERG. Let me move closer to the screen. Maybe that will do that.

Mr. PALLONE. And ask your question, and then go ahead.

Mr. WALBERG. The question is this: Commissioner O'Rielly, I have heard concerns that this program could be used to overbuild existing broadband networks with fiscal infrastructure that are, in many cases, already funded by other Federal programs. Does this bill have sufficient safeguards to address this concern?

Mr. O'RIELLY. I don't believe so. I don't——

Mr. PALLONE. I think he asked it, Mike. You can answer.

Mr. O'RIELLY. OK. I will answer. I don't believe the bill addresses that, and I worry the money that is invested in other Federal programs is either going to be wasted or conflict and definitely lead to the point of overbuilding, to subsidized overbuilding. Overbuilding is fine. It is competition. But subsidized overbuilding is incredibly problematic and harmful to those that don't have service.

Mr. WALBERG. Thank you. Two years ago, I talked about the disastrous, heavy-handed Title 2 net neutrality regulations would destroy proconsumer service offerings like sponsored data plans, and now a California net neutrality law has done exactly that. Once again, it looks like heavy-handed regulations like those in this bill are poised to hurt consumers.

Commissioner O'Rielly, can you talk about how the heavy-handed regulations in the bill's Title 1, subtitle C broadband programs would prevent small providers from being able to participate and undermine their ability to bring broadband to rural Americans like mine?

Mr. O'RIELLY. I think the bill has a number of requirements, and you outlined one section. I think there are a number of requirements that will make certain providers not want to participate or unwilling to participate or unable to participate. And the California example highlights that situation. The zero ratings, for instance, in a case that California has as part of its prohibition, is something where big providers and small are not going to be able to—they are going to have to change their practices because of.

And then that, to me, is a detriment to actually getting all and having many competitors in the space that we want to compete for these dollars and having a full-on competitive bidding situation.

Mr. WALBERG. Thank you. Moving to 9–1–1, Commissioner O'Rielly, what would be the impact to States like Michigan who have already spent over a decade investing in planning and executing NG 9–1–1 if we were to restrict existing technologies from being used?

Mr. O'RIELLY. Yes. I am not sure why the bill goes in this direction. I am worried. We tried flexibility, bipartisan structure in the Spectrum Act of 2012 to make sure that the States had an ability to work through their system, and need is so important in this equation.

And I have visited those call centers, many visited during my time period at the commission. And I am leery if they are saying there is a problem in the States that the value of the dollar that they are investing and also the program direction they are going is being federalized. I think that is incredibly problematic and should be reviewed.

Mr. WALBERG. Thank you, Mr. Chairman. I yield back.

Mr. PALLONE. Thank you.

Next is Dr. Ruiz.

Mr. RUIZ. Thank you, Mr. Chairman. I am actually wearing my white coat today because I am actively participating in vaccinating some of our hardest-hit, highest-risk community members in my hometown of Coachella. So, if you see me wearing my white coat, it is not without its context.

The LIFT America Act that we are considering here today will help our Nation build back better and deliver much needed infrastructure improvements for our districts. There are a couple key parts of this bill that I would like to touch on today. The first issue is ensuring that Tribal nations——

Mr. PALLONE. Well, we lost your voice. I don't know if he is muted or what happened. Can't hear you. We may have to come back to him. Former FEC Commissioners are not allowed to laugh. All right. We will have to come back to him.

Next is—I guess it is—Debbie's not on. Debbie's there. All right. We will go to Ms. Dingell next, and then we will come back. Debbie.

Mrs. DINGELL. Thank you, Chairman Pallone, and thank you for hosting this hearing.

As we look to shift from relief to long-term economic recovery from the COVID pandemic, we have got a real opportunity to make bold investments in our infrastructure, to build back better and at the same time rapidly transition to a clean net-zero economy that will support good-paying American jobs, protect public health and the environment, and invest in frontline communities, allowing all of us to thrive.

I am proud that this bill has a number of my legislative priorities and bills, including the dam and hydropower safety establishing a green financing accelerator, and makes investments in electric vehicles manufacturing retooling, expands the Advanced Technology Vehicles Manufacturing program, and helps deploy a network—it helps deploy the EV infrastructure that we desperately need in this country.

Secretary Moniz, I am talking fast because I would like to move right to some questions focused on the future of electric vehicles and the clean energy and sustainability accelerator as we aim to rebuild our Nation's infrastructure and economy.

And as you know, several of our auto manufacturers have said that they are committed to an EV future, but that means three things. We have got to build consumer confidence, which means they have to be able to afford the car, they need a battery that has got range, and they need to know that they can charge it when they are out there.

So my first question to you is how would—so, and you noted in your testimony today's domestic battery manufacturing capacity is thanks, in part, to DOE's Advanced Technology Vehicles Manufacturing or ATVM loan program. The ATVM program still has $17 billion in lending authority.

The LIFT America Act and the standalone legislation I will be introducing soon would expand and modernize the ATV programs to include low- and zero-emission medium- and heavy-duty vehicles

and make it easier for component manufacturers to qualify. LIFT America would also update and reauthorize DOE's Domestic Manufacturing Conversion Grant Program at $2.5 billion per year.

So my questions for you are how would these revitalized programs help with our economic recovery, increase domestic manufacturing of clean energy supply chains, and that is something we really have to talk about. We need to build those batteries here, not overseas. Those jobs need to be here. And three, accelerate the deployment of clean energy infrastructure. Thank you.

Dr. MONIZ. Well, thank you, Mrs. Dingell. It is good to see you again. Well, you have put your finger right on it. First of all, the ATVM program, for those who are not familiar, really helped a couple of major battery production factories to be built. And modernizing through the LIFT Act the ability to support supply chain, EV supply chain development, I think is really right on.

And I might say that, quite bluntly, the last 4 years have seen the loan program pretty much on hold. Secretary Granholm has appointed an excellent, experienced investor to head the program now, and I believe that it will be very, very active, and this area of transportation should be a focus.

And I think, just to repeat, the fact that our domestic manufacturers are so committed in this direction, they have made those business model choices. The cost of ownership is going to equal and then drop below that of an internal combustion engine. So I can see why GM and Ford, et cetera, are saying that this is their future.

Mrs. DINGELL. Let me ask you another quick question, and then I have questions for the record. What do you think the growing adoption of electric vehicles will mean for the grid, which has come up in other questions? And, in addition to charging infrastructure, what grid upgrades are needed to support the increased demand? But we need to not complain about needing to do it, we just need to do it for the future.

Dr. MONIZ. No. In fact, I think we have heard some statements here that, frankly, overstate the needs on the grid—for one thing, because we will continue to see much more efficiency, and this will contribute to some low growth for the utilities. But we could also remember, the utilities are in the lead in terms of decarbonization, so it kind of—it all fits together in a sensible way.

The other thing is—and this is more speculative, I have to admit—but we know that vehicle-to-grid integration will also be part of the new infrastructure and can supply some new grid services. So I think this is opportunity. To me, it is not a concern.

Mrs. DINGELL. Thank you. And I guess I am out of time, Mr. Chairman, although I am not sure I didn't have a little taken away from. I yield back.

Mr. PALLONE. Thank you.

We will go now to Congressman Palmer, who is recognized for 5 minutes.

Mr. PALMER. Thank you. You know, as my colleagues have said, billions of dollars in the Federal programs, and yet, we are failing to address one of the biggest obstacles that we have in terms of getting the infrastructure built that we need just to maintain our economy, much less move to a cleaner energy infrastructure.

Last week in our hearing, I asked a witness how long it takes to get newer, cleaner infrastructure built. He stated that underneath a Federal administration-related infrastructure project takes upwards of 7 to 8 years just to get the paperwork finished. A project to expand public transit outside of Philadelphia has been underneath a review since 2012. I would think if we want to encourage more people to use public transit that we would make it a priority to get it built.

Now, these delays are not rare, and it doesn't only relate to transportation infrastructure and other infrastructure. It will relate to broadband as well. I asked the Army Corps of Engineers to give me a list of outstanding feasibility studies, and it took nearly 9 months for them to respond to that. And when I did get it, I got a list of 97 studies that have been underway for hundreds of months at the cost of millions of dollars.

And my point about this is that, since some of my Democrat colleagues have predicted that we only have 10 years before we have a worldwide climate catastrophe, shouldn't we be looking at ways to expedite our permiting process for infrastructure, maybe for building nuclear power plants that have no $CO_2$ emissions? Mr. Moniz.

Dr. MONIZ. Yes. I agree that, as I said earlier in the context of CCS, and it is true in many other contexts, that we often have too many serial permiting requirements. What we need to have is at the Federal and State levels processes that involve all the stakeholders. Again, do not cut corners, but provide a coherence that allows the end-to-end permiting process to be much shorter because, frankly, I would share the concern that some of these processes are going on so long that they conflict with the time scale in which we need to introduce new technologies.

So I think that is a very important overarching issue, and it is one where I think we need to have real serious coalition building to bring together the different constituencies who really have legitimate claims to be addressed in the permiting process.

Mr. PALMER. That is one of the things that I worked on when we were in the majority and I chaired the Subcommittee on Intergovernmental Affairs, was getting rid of the duplicative, the obsolete regulations. I would also think that we would do well if we had a portal, where it was a one-stop shop for permiting to expedite this, and not only for building an infrastructure that my Democrat colleagues advocate but for doing basic things like—for instance, there was a study undertaken after a flood in 1983 in Louisiana to build a diversion canal from the Comite River over to the Lilly Bayou, and it took 38 years before anything was done, and that was only after a devastating flood in 2016.

So I appreciate your candid and accurate response to that, Secretary Moniz.

Dr. MONIZ. In fact, if I could add, in some cases, California, for example, does appoint one of the multiple agencies to be the lead, so it really kind of coordinates it. That is the kind of thing we need more of.

Mr. PALMER. If nothing else out of this hearing, I would hope that we can come up with a productive solution to this. If we are

going to waste hundreds of billions of dollars, let's build it as efficiently as we can.

And with that, Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

So now, I am going to try and go back. I see that Dr. Ruiz has his lab coat on there. Can we hear you? You are recognized again.

Mr. RUIZ. Now, can you hear me?

Mr. PALLONE. Yes.

Mr. RUIZ. OK. Good. So let's get right to it. You know, I already told you why I am wearing my lab coat. I am actually vaccinating people outside. I am at a community vaccination clinic in one of our hardest-hit, high-spread communities in my district. So that is why I am wearing the white coat, just so I didn't throw people off as to why in the hell am I wearing a white coat during a congressional hearing, but it is because I am doctoring right now out these doors.

The LIFT America Act that we are considering today will help our Nation build back better and deliver much-needed infrastructure improvements for our district. I want to talk about two issues. One is the Tribal broadband prioritization in order to help our Tribes get the state-of-the-art healthcare, educational, and economic opportunities that exist. They have been the least to be connected in America. What was already a problem turned into a catastrophe once the pandemic hit. When schools closed and in many cases the nearest hospital or clinics was hours away and without robust connectivity, people couldn't work remotely or take advantage of telehealth services.

In 2018, as part of the RAY BAUM's Act, Congress enacted my bill, the Tribal Broadband Deployment Act, that required the FCC to study and report on Tribal broadband connectivity. When the FCC finally issued its report in 2019, the data showed that there isn't just a digital divide in Indian country, it is a digital canyon. No matter what metrics you looked at, Tribal lands have significantly lower access to broadband than non-Tribal lands.

That is why the LIFT America Act is so important. This bill will make historic investments to expand internet access to increase economic and telehealth opportunity for Tribal communities. To do this, the LIFT America Act includes my bill, the Tribal Internet Expansion Act. It amends the Communications Act to direct the FCC's Universal Service Fund to explicitly prioritize Tribal lands along with rural and low-income areas.

In addition, the LIFT America Act, which I am pleased to cosponsor, dedicates $500 million for Tribal connectivity and sets aside funds to increase adoption in digital equity on Tribal lands.

Chairman Wheeler, much needs to be done to ensure that Tribal communities are fully connected, but in your opinion will these provisions help increase broadband connectivity on Tribal lands?

Mr. WHEELER. You are absolutely right, Congressman. Your amendment—your bill—for instance, to amend Section 254 to make it clear what the responsibility is in Tribal lands is important. What the LIFT Act does also includes Tribal lands.

Let me just make one quick point about another provision of the LIFT Act that is going to help Tribal lands and everybody else, and that is the requirement for transparency. You know, I spent a lot

of time on Tribal lands when I was chairman, and what I was finding was that they were kind of given a take-it-or-leave-it choice for their local provider, and they didn't know what other areas were being charged for similar service, and the transparency that this bill does will help in that regard too.

Mr. RUIZ. Thank you. Thank you very much.

The other area of this bill I wanted to highlight is a section advancing residential solar energy for lower-income communities. Climate change has most significantly affected many lower-income communities, yet too many of the technologies that will save our planet are still primarily available to those with higher incomes. Production of clean, renewable energy should be accessible to every community, regardless of their ZIP Code or economic status.

Especially in my district where we experience over 350 days of sunshine per year in southern California, Palm Springs area, there is huge untapped potential for every community to harness clean energy for their own homes.

Secretary Moniz, I want to talk to you specifically about access and equity in the energy transition. The LIFT America Act includes funding to build lower-income community solar installations. Why is equitable access to clean energy important? And how do we ensure that our transition is actually equitable and inclusive? And, in addition to community solar, what are other options that we can pursue?

Dr. MONIZ. Well, Mr. Ruiz, certainly providing our reliable, clean electricity and affordable electricity in Tribal lands has always been a very, very high priority of mine, because it is—well, it is the right thing to do and it provides also the opportunity for education, for employment. It is an equity issue.

In 2016, I was very pleased with bipartisan support to finally get I think it was $11 million appropriated to provide credit support for perhaps $100 million of loan programs for energy projects on Tribal lands. I think it is time to employ that, and frankly I would love to see that increased by an order of magnitude.

Mr. RUIZ. Thank you very much.

And I yield back my time.

Mr. PALLONE. Thank you.

Next is Congressman Dunn.

Mr. DUNN. Thank you very much, Chairman Pallone.

I think we can all agree that some Federal investment aimed at improving our Nation's infrastructure is needed, and surely every one of us can think of infrastructure needs specific to our districts. I am disappointed, however, that this LIFT Act lacks a bipartisan buy-in and, like the American Rescue Plan, lacks targeted allocation of funds.

Has this committee taken the time to assess the status of the trillions and trillions of dollars appropriated just last year to many of the same departments and programs that the LIFT Act would pour money into? I know that my Republican colleagues and I have not seen an accounting of these unspent funds or the timeline for spending those funds. So I would also hope, as this committee engages in a thorough legislative process, that we will see some data and analysis of the appropriated and spent funds as well.

I would like to focus my questions on what appears to be duplicative health policy in the LIFT Act.

Dr. Frieden, section 40001 in the LIFT Act requires the HHS Secretary to develop standards for voluntary accreditation of public health departments and labs. As you know, CLIA includes Federal standards for all labs, and labs that perform higher complexity testing are also issued accreditation approved by CMS. In addition to these requirements, the National Public Health Performance Standard, the Standards, accesses capacity and performance of public health systems.

Given that all labs already comply with the aforementioned requirements and the labs were put through the wringer last year, why do we need a new set of standards for accreditation of public health labs? What is the problem with the current standards?

Dr. FRIEDEN. Actually, Congressman, there are some gaps, and I think accreditation can serve as a way of advancing quality. Right now, there is something called the Public Health Accreditation Board, and that board set up voluntary standards for health departments, including public health laboratories. And what we really found was that the vast majority aren't up to speed, and so——

Mr. DUNN. You know, I would love to—in 5 minutes, we can't answer that, but I would love to talk to somebody over there about that offline because this is—or learn how——

Dr. FRIEDEN. We would be happy to follow up with you, Congressman. I think that the big picture is that accreditation can set standards that can allow Congress and other funders to hold entities accountable for where——

Mr. DUNN. I think we can do that, though, without adding too much more red tape to our public labs, which I don't think they need. So, if there is some problem, let's get what the problem is and add that to the accreditation that we have.

I want to shift to section 40003, hospital infrastructure funding. This section prioritizes grants for hospitals whose projects will, quote, "include by design public health emergency preparedness and cybersecurity against cyber threats," end quote.

Now, the already existing Hospital Preparedness Program is a dedicated source of Federal funding for hospitals and health systems to prepare for, respond to, and recover from all kinds of threats, including cyber.

In your opinion, do you think that the existing Hospital Preparedness Program is insufficient to address preparedness? And, if so, why does focusing Hill-Burton program funding on preparedness, why is that more appropriate than simply boosting the existing Hospital Preparedness Program?

Dr. FRIEDEN. The Hospital Preparedness Program has not been run by the Centers for Disease Control and Prevention, which has directed that by what is called the ASPR, the Assistant Secretary for Preparedness and Response. Funding for that program has been substantially reduced over the past decade, decade and a half, and I think quite—to be very blunt, that the impact of that program has been limited. It is important that it be focused, whether on this issue or others that Congress decides. It is a possible route for funding that has not been particularly effective in the past, and I think you don't need to look any further than COVID to see that.

And this is one of the areas that a health defense operations approach would allow you, Congress, to decide on. You could decide which line——

Mr. DUNN. Sir, we are going to run out of time here, but I just want to say this is two examples, among many, but it seems to me the funds in this bill could be targeted more specifically towards our goals. If the goal is to fund preparedness activities and if the existing program is lacking funds, then some of the funding in this bill could be specifically targeted to, for instance, the Hospital Preparedness Program.

Surely, we could find those funds somewhere in the $6 billion pot of money for open-ended—you know, for public health infrastructure spending.

With that Mr. Chair, I yield back.

Mr. PALLONE. Thank you.

Now we are going to go to the gentlewoman from New Hampshire, Ms. Kuster.

Ms. KUSTER. Thank you, Mr. Chairman. Thank you again for hosting this hearing.

I think it is really important for us to be addressing our infrastructure that has been crumbling all across this country, and right here in New Hampshire we have red-listed roads and bridges. I understand the American Society of Civil Engineers has given American infrastructure a C-minus. So, when Congress fails to make these investments, ordinary Americans are left holding the bag, unable to participate in the digital economy or remote learning or home healthcare because of bad internet connections.

But the LIFT Act makes important investments in improving our infrastructure, including water infrastructure, and I wanted to discuss a "dam" good idea that I have come across. I am super excited about 2lst century hydropower and projects to improve the vitality of our Nation's rivers. So this morning, I led a letter with 39 of my colleagues, including many on this committee, to the Biden administration to include funding to rehabilitate, retrofit, and remove dams, the three R's, in the next infrastructure package.

The letter is supported by both river conservation and hydropower groups. It is built off of the Stanford University Uncommon Dialogue Agreement that robust investments are needed in the three R's to reduce carbon emissions, promote healthy river ecosystems, and create jobs.

So, Secretary Moniz, I want to commend you and EFI for your leadership on the three R's. And my first question to you is this: Should the U.S. rehabilitate, retrofit, and remove dams to bring the clean energy benefits of hydropower and the environmental and economic benefits of healthy rivers to fruition?

And that is——

Mr. PALLONE. Secretary Moniz, you are muted, I think.

Dr. MONIZ. Oops, thank you. Thank you.

I was thanking the Congresswoman for her leadership on this "dam" problem, as she referred to it.

This is a tremendous opportunity. And, by the way, we were pleased to help. Stanford was really in the lead on this, but we were pleased to help. But it is an opportunity for more hydropower. It is an opportunity for healthier rivers. It is an unusual coalition

between conservationists and energy people. It is just a perfect program, and I think we should move out on this really, really fast.

Ms. KUSTER. Great. That is why I call it a "dam" good idea.

What type of Federal investment would be most effective for increasing hydropower generation and electricity storage in improving the health of our rivers? And if you might quickly explain to my colleagues the benefits of storage with hydropower.

Dr. MONIZ. Yes. Well, today it is not commonly known that pumped hydro storage, essentially pumping water up so you can have it fall down and generate electricity when needed, is actually the dominant storage technology today in this country. But you need to have the right water resources, the right topology, and maximizing that through this dams initiative—by the way, we have about 90,000 dams in this country, some powered, mostly unpowered, and some safe and some unsafe.

So this has all kinds of dimensions, from providing storage for our wind and solar resources, to safety, to—I am a very avid fly fisherman—to better ecosystems for cold-water fisheries as well.

Ms. KUSTER. Great. Well, thank you for that.

Quickly now I am going to shift gears a bit.

Mr. Wheeler, I want to quickly touch on high-speed broadband. As Congress and the FCC look to deploy additional resources, can you speak to the importance of first deploying broadband to completely unserved communities?

Mr. WHEELER. Thank you, Congresswoman. That is a great question.

One of the things we have learned today, you all—one of the things about this body is you are representative. You are also representative in what we have seen today in some of the connectivity problems that this country has. And one of the Members said earlier that we need to use the dollars wisely. I think that is the point that you are making. We don't want to have second-class service for rural areas, and the excuse that somehow unserved areas are going to get to the back of the line is just a figment. You run an auction, and you say, "Y'all come," and everybody gets the opportunity to come to participate in that auction. And that is what can happen in your State, in rural areas, and elsewhere.

Ms. KUSTER. Terrific. Thank you so much.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

We now go to Congresswoman Lesko.

Mrs. LESKO. Thank you, Mr. Chairman. And for the witnesses, I am a Congresswoman from Arizona. It is great to be in front of you today and have you here.

I share the—I don't understand, I should say, why the standard in this bill is 100 megabytes per second upload and download, you know, download and upload. I don't understand the need for that. And it has been said here that there is a concern that because that is the standard set in this bill that just about every single community in America, including communities that already have, you know, broadband services, are going to get the money as well, and these rural areas that don't have anything aren't going to get it.

So I am hoping, and I want to tell my colleagues that I am willing to work with you. It seems like a simple fix to me on that is

to prioritize areas that don't have broadband at all in this bill. And so I am willing to work with my Democratic and Republican colleagues on that fix.

My question, though, changing subjects, is for Mr. Moniz. You had brought up the mining of critical minerals, and I just want to read a couple of things that I had read first and then ask you a question.

It says that 35 critical and rare earth minerals of strategic importance to energy applications, high-tech manufacturing and defense, have been identified by the previous administration. The energy applications of these critical minerals include magnets and wind turbines, batteries, and electric and conventional vehicles, phosphorous, and energy-efficient lighting and displays, and catalysts for mitigating greenhouse gas emissions. The U.S. is entirely reliant on imports for 14 of the 35, while imports account for at least 50 percent of the supply for another 17.

And I think I read recently that, as far as lithium that is used in these electric vehicle batteries, that most of it is produced in Australia, if I am not mistaken, and then Chile, and then China. But I am pretty sure—and I want you to confirm—that it said that China processes most of it using coal-fired plants.

So, first, I want you to confirm if China processes most of the lithium. But then my question is, How do we get more mining here of critical minerals, including lithium, and make sure that we are able to do so? Because there is a lot of environmental concerns, and so how do we balance that?

Dr. MONIZ. So, Congresswoman Lesko, first of all, just let me reaffirm that the need for these critical minerals is going to just skyrocket, frankly, as we deploy new technologies. Number two, you are absolutely right that China—it is not only lithium. actually, China dominates the processing of many of these critical minerals. So I think there is no doubt as a—you know, as a sane energy security issue, we need to work to diversify these sources of minerals and their processing.

Now, in the United States, we will be able to expand our production in some of these areas. In lithium, for example, there are initiatives in the Salton Sea, initiatives in North Carolina, et cetera, but for other minerals, like cobalt, I just don't think we have the natural resource.

So what we need to do is to really work with our allies—Canada, Australia, for example—which have significant mining experience and active mining, so that we can have a balance, at least, against the Chinese processing dominance.

Now, in terms of reexamining mining, there is a lot of discussion going on, for example, in Minnesota, in the iron range, et cetera. But I think that this is, again, a case where constituencies need to come together, balance climate, environmental, improve environmental footprint. But I believe we do need to expand domestic mining as an energy security issue in a low-carbon world.

In fact, if I may just give one factoid that gives you an idea of the scale: One of the very large offshore wind turbines—and where I live in New England, offshore wind has got to be a big part of the solution—just one of those turbines requires a ton of a rare earth mineral. So this is big.

Mrs. LESKO. Yes. Thank you. It is really big. And so I hope all of our committee can figure out a way that we are not so reliant on hostile countries, including China, to process and also to mine. We have to come—we have to do it.

And so with that I yield back.

Mr. PALLONE. Thank you.

Next, we go to Congresswoman Barragán.

Ms. BARRAGÁN. Thank you, Chair Pallone, for holding this important hearing on the LIFT America Act, which invests more than $312 billion in infrastructure to reduce pollution, combat climate change, narrow the digital divide, create jobs, and increase access to healthcare.

I am especially proud that provisions from my bill, the Climate Smart Ports Act, have been included in LIFT to help ports reduce pollution by investing in zero-emissions technology. Nearly 40 percent of Americans live within 3 miles of a port, including communities of color in my district near the Port of Los Angeles. While ports create jobs and help our economy run, they also are major sources of air pollution that often impact the public health of communities of color. Modernizing our ports is good for our climate, environmental justice, and our public health.

Secretary Moniz, America's trade volume is expected to see an increase of 300 percent by 2030. Do you agree that electrifying our ports is an important climate solution, given how connected they are to the goods movement system nationally and globally?

Dr. MONIZ. Absolutely. In fact, I might say that in the Quadrennial Energy Review back in 2015 we made that recommendation, and your acting on it is really a very, very good idea. As you said, there are environmental justice issues. There is a lot of energy trade as well that goes through our ports. And I just mentioned offshore wind as an example. That is going to require a whole port infrastructure to develop, maintain, et cetera.

So electrifying that, and/or using hydrogen, clean hydrogen or zero-carbon fuel, there are a few options. But going to zero-carbon ports would be an enormous, enormous step forward.

Ms. BARRAGÁN. Thank you for that. I think it kinds of leads into my second question that you covered a little bit.

The LIFT bill includes a critical downpayment of $3.8 billion over 5 years in decarbonizing ports. Given that there are 360 commercial ports in the United States and we are hearing the average cost of decarbonizing a port is at least half a billion dollars, do you agree we need to be investing as much as possible to meet that need?

Dr. MONIZ. Yes. I think—but with the Federal funding, of course, as much as possible, leveraging other funds to come in with, perhaps, creative financing ways, because it will require a lot of resources.

I would also argue that environmental justice could be used as one of the priority factors in terms of how the investments will be made.

Ms. BARRAGÁN. Well, thank you.

Mr. Secretary, for you next, the LIFT bill makes critical investments in grid modernization to improve resiliency during extreme weather events, which will become more frequent due to climate

change. When you were Energy Secretary, your department provided grants, small grants to towns and cities to assist in building microgrids to support critical facilities, such as hospitals or fire departments during power outages.

Do you think LIFT should invest in clean energy microgrids for communities across the country as part of a climate resiliency strategy?

Dr. MONIZ. Yes. And I might also add, by the way, of course, microgrids play a huge role in our defense facilities, our bases. But going back to the question, I think microgrids should be looked at as one integral part of the overall smart grid structure of the future because it provides the ability—especially during risky periods for the grid stability, it provides the ability to, in a certain sense, decouple and serve a critical load in a reliable way during a stress on the grid.

Ms. BARRAGÁN. Well, thank you, Mr. Secretary.

I have a clean energy microgrids bill with Representative Clarke that focuses these investments in the environmental justice communities. I hope as we markup LIFT that we can include further support for microgrids in this legislation.

And with that, Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

Next, we go to Congressman Pence.

Mr. PENCE. Thank you, Chair Pallone and Ranking Member Rodgers, for holding this meeting today.

One-third of the legislation we are considering today authorizes clean energy programs, and so I would like to focus my remarks today on these considerable provisions.

Following a long career in the petroleum industry, I came to Congress to address the challenges facing our critical infrastructure in both the short term and on a long-term basis.

In Indiana, the crossroads of America, we have always recognized the importance of modernizing and investing in our aging infrastructure. We rank number one in roads. This contributes to the prosperity of not only Hoosiers but all Americans. What the current administration fails to realize is that the demand for affordable, reliable energy is only going to increase. As my colleagues on this esteemed committee know, sources of clean and renewable energy will only be as useful as they are reliable.

I support an all-of-the-above approach to energy production, but the intermittent nature of solar and wind will leave a gap in baseload power that consumers need for reliable and affordable energy.

To support the robust network of electric vehicles that the LIFT America Act suggests, disruptions in available power will have even more disastrous implications in our economy and national security. Fossil fuels, like natural gas and coal, are needed to protect the integrity of our grid and affordability of electricity prices on a baseload basis.

Unfortunately, this legislation misses the mark on any meaningful expansion of the pipeline infrastructure that is needed for cleaner-burning, reliable fuel. I hope that the majority will consider additional provisions that support the robust pipeline distribution that will be necessary to sustain energy needs for the electric vehicle network that this legislation envisions. Pipeline distributions

will continue playing an important role in other clean energy technologies.

I am proud that Cummins Engine Company, headquartered just miles from my home in Columbus, Indiana, is developing world-class innovation to advance cleaner technology using hydrogen and fuel cell solutions. However, like any other fuel, hydrogen will need to be transported from point A to point B, and pipelines will have to be part of the equation if we are to enable the hydrogen fueling infrastructure provisions in this bill.

My bipartisan Clean Energy Hydrogen Innovation Act is a good first step to advance U.S. leadership in hydrogen innovation through the Department of Energy's loan guarantee program.

Mr. Moniz, in your testimony you touched on the need for low-carbon fuels to complement clean electricity. I agree with your sentiment that hydrogen has the potential to play a critical role in an all-of-the-above energy strategy in a wide array of applications.

My question is this: How quickly do you think we could create a distribution network to bring this innovative carbon-neutral or in some cases carbon-negative solution to market, and what are the elements of this network? And, finally, does it include pipelines?

Dr. MONIZ. Thank you, Mr. Pence, for the question.

In fact, in my testimony there was a rather complicated figure in which my answer really is centered. Namely, I would see the opportunity to really focus on hydrogen market development in this decade. We need to move out, I think, quite quickly on this.

For example, we showed in that figure to which I am referring to how the United States—and I think Indiana would be one of those cases, where the convergence of industry and power and the opportunity for $CO_2$ sequestration, they all converge.

And so what we would argue for is that Congress could really incentivize two, three, four of these hydrogen $CO_2$ hubs to be really focused on in the near term. And that could be a mixture, given the $CO_2$ opportunities, a mixture of so-called blue hydrogen and potentially green hydrogen as well. But hydrogen, as you have said, has this capacity to, essentially in the longer term, replace the role of natural gas in serving multiple end uses, and I think in a low-carbon way. So that is really important. And I think we could move out in 5 years if there was a focus on these dispersed number of demonstration hubs.

Mr. PENCE. Well, thank you. I sure hope we consider this very quickly. I know there are some, I will call them manufacturers, that believe this technology is here today.

And, Mr. Chair, I yield back.

Mr. PALLONE. Thank you.

Next, we go to Lisa Blunt Rochester.

Ms. BLUNT ROCHESTER. Thank you, Mr. Chairman, for calling this crucial hearing on the LIFT America Act, and thank you to the witnesses for your testimony today.

As we know, the COVID–19 pandemic has exasperated an already crumbling infrastructure. For too long, we have neglected to invest in our country's infrastructure needs, and many of our Nation's roads, bridges, dams, and drinking water systems are in desperate need of upgrades and repairs. As we consider legislation to

modernize our Nation's infrastructure, it is also critical that we remember that investment must include broadband.

The Enhanced Emergency Broadband Act, which I proudly support, expands access to internet for low-income individuals and families that were disproportionately impacted by the COVID–19 pandemic. And while I was pleased to see this bill's inclusion in the package, we need to look for the permanent solution for broadband affordability, especially as we continue to move toward an increasingly digital world.

The LIFT America Act also makes a long overdue investment to reduce emissions at our Nation's ports as was shared by my colleague, Ms. Barragán. This language is based in part on the Climate Action Planning for Ports Act, which I introduced earlier this year. Ports and the trucks, ships, trains, cargo-handling equipment that serve them are major sources of greenhouse gas emissions and continue to threaten the health and well-being of near port communities, many of which are low-wealth communities and communities of color. By [inaudible] ports, we will not only help to address the ongoing climate crisis and historic environmental injustices in this country, but we will also create good-paying jobs, and we need to work together to do this.

Secretary Moniz, my questions are for you. What are the benefits of investing in emissions reductions at ports, and how will decarbonizing ports improve public health while expanding economic opportunity?

Dr. MONIZ. Well, thank you, Congresswoman Rochester.

Well, first of all, of course, decreasing emissions anywhere is very important for our collective well-being as we see how the climate is changing and the extremes of weather are becoming more and more frequent and, frankly, more and more expensive for us to deal with. So that is number one.

Number two, now ports are pretty intense sources of emissions, so they represent a great opportunity to reduce emissions, and, at the same time, as you say, in many, many, many cases address social equity issues, given the frontline communities that are often near, practically colocated with these ports.

Third, there is going to be a lot of action around ports increasing. So, again, they present a major opportunity, as I said earlier, both for broader trade issues but also in Delaware—I am in Massachusetts, the Atlantic coast—we already have 20 gigawatts of offshore wind projects in development. There is another dozen being spoken of. It is going to increase, and this is going to require developing major port facilities, major onshore infrastructure, major job implications, and those jobs hopefully could go as well to some of those nearby communities that could use good jobs.

So it is a winner all around.

Ms. BLUNT ROCHESTER. Sure. That is a great segue into my next question.

I got a chance to visit the Port of Wilmington in Delaware last week to talk with them about the fact that local labor unions have worked with them in our port to make sure that it is cleaner, it is electrified. And would you agree that an investment in clean energy ports will help disperse job creation with the proper labor pro-

tections, which are in this legislation, that we can mitigate any potential negative impacts on port workers?

Dr. MONIZ. Absolutely, and in fact I would give you an anecdote. Going back to the offshore wind case, at my organization, EFI, we have a partnership with the AFL–CIO. We have 10 areas that we want to study that would be part of addressing low carbon with a focus on good jobs. In the discussions with labor, number two on the list of 10 is offshore wind and developing those supply chains, including of course the onshore supply chains. So spot on, yes.

Ms. BLUNT ROCHESTER. Thank you so much, Secretary Moniz, and I am excited to see what we are doing at our port and want to make sure that all ports across this country have the tools and the resources and the funding to decarbonize.

Thank you, Mr. Chairman. And I yield back.

Mr. PALLONE. Thank you.

Next is Congressman Crenshaw.

Mr. CRENSHAW. Thank you, Mr. Chairman. Thank you all for your patience in suffering through all of our questions. It is greatly appreciated.

Look, our main problem with this is, as usual, we are spending lots of money. We are attaching morality to a dollar sign. We are attaching the length to which we care about something to dollar signs. This is a fallacy, especially with infrastructure. We cannot keep throwing money at things without a better plan to incentivize at least some private investment, and this bill does the opposite in many, many cases across the spectrum.

When you have an infrastructure plan, you should definitely start by making it easier to build said infrastructure instead of putting additional mandates and regulations that make it harder. Let me give you an example. Last week we debated the Clean Future Act. One of the big proponents of that Act is to ban future plastic manufacturing. OK. Well, I thought we were trying to build fiberoptic cables.

So this question is for Mr. O'Rielly. If we are not going to be producing more plastics, if we are going to make that impossible, how does that affect our ability to lay down thousands of miles worth of fiberoptic cable?

Mr. O'RIELLY. It is a component of—I mean, glass and plastic and a lot of things go into the universe. It is going to make it more difficult, more expensive, and it may even drive to buy purchases in other countries.

Mr. CRENSHAW. Another question. I have spoken to a lot of industry experts on this. Is fiberoptic cable into rural areas the only way to get broadband to rural areas?

Mr. O'RIELLY. Well, it depends on what speed you are talking about. Many rural America consumers today get it through a variety of technologies, and they enjoy it. Most consumers don't care where the technology is, as long as it meets their family's needs. So we have satellite, we have wireless, we have got definitely fiber, you have got coax. So there are a number of different technologies that are operating today that people are able to connect to broadband. If you raise the rates and the speeds as identified in the bill, well, then you basically are saying it is only fiber.

Mr. CRENSHAW. Yes. And I guess, you know, let's talk about those rates. You have mentioned 25/3 over and over again. I just Googled what it takes to watch Netflix, what Netflix recommends. If you have multiple people trying to watch HD, then they want a 5 megabytes-per-second speed, so that is obviously significantly less than 100/100.

OK. I live in Houston. I don't think we suffer from low internet speeds. But generally speaking, what does an urban area like mine have as far as speeds go? Would we be under—what I am getting at is, would we be considered unserved if we went to this 100/100 speed rating?

Mr. O'RIELLY. Well, there is—the estimate I have seen is that 57 percent of America will be deemed unserved under the definition. So, I don't know if that would cover a major metropolitan city top 10 market like Houston. I would suspect probably not. But a number of markets that we would determine otherwise—I mentioned Buffalo would fall in that case, where I come from. So I mentioned a lot of markets that people wouldn't estimate as rural or unserved would now be deemed that way.

Mr. WHEELER. Congressman, 80 percent of Americans have 1 gigabit today, so I am sure—and that is basically what cable companies provide. They are, by the way, upgrading to 10 gigabits.

Mr. CRENSHAW. OK. I mean, I certainly don't have 1 gigabit. I can check that. The point is this. There is a lot of—and there seems to be conflicting data on this, but the point is this, and I think the point Mr. O'Rielly was making earlier, and the reason we believe, and the reason industry has told us: This is what will happen with the flow of dollars if you make it 100/100 is when it is unnecessary for what we are actually trying to accomplish just in our daily lives, OK.

But, second, it causes a lot of urban areas to be considered unserved when, in fact, they are perfectly well-served. And, of course, money is going to flow there. It just makes sense from an investment perspective. That is our issue with this.

I want to move on to Secretary Moniz and move the conversation—I am already out of time—Mr. Moniz, this plan does not have anything for the one baseload energy that is carbon free: nuclear energy. You have written in the past about supporting the need for nuclear and next-generation nuclear. You haven't changed your mind, have you? We would still need to do that, I would assume. Because the thing about investing in purely renewables is they are inherently unreliable.

Dr. MONIZ. Well, I wouldn't characterize the renewables as unreliable, but I do support and continue to support modern nuclear—both fission and fusion, by the way, where the private sector in both cases has really stepped up to the plate with enormous infusions, more innovation than we have ever seen in nuclear—and I think this is very promising for impacting our grid needs in the next couple of decades.

Mr. CRENSHAW. Well, thank you.

I yield back.

Mr. PALLONE. Thank you.

We now go to Darren Soto.

Mr. SOTO. Thank you, Chairman.

President Biden ran on the promise to build back better, and he won. He won because he promised to defeat the coronavirus and bring us back to prosperity. He also won because he promised, to, quote, create millions of good union jobs, rebuilding America's crumbling infrastructure, from roads to bridges, to green spaces and water systems, to electrical grids and universal broadband as part of that Build Back Better plan.

Eighty percent of Americans support rebuilding our Nation's infrastructure. Even President Trump said he wanted a $1 trillion infrastructure package. Yet infrastructure became a long running joke for 4 years. How sad for the American people.

I am hearing criticism today from my colleagues across the aisle, but you had your chance. You had your chance for 4 years and wasted it. We are not wasting any more time. Americans across the country are serious about infrastructure, and we are serious about infrastructure, and that is why we are moving forward with the LIFT Act, with or without you. The LIFT Act will finally lift America's infrastructure into the 2lst century.

First, it will modernize our electric grid and boost renewable potential, make our grid more resilient against natural disasters, like hurricanes that Florida experienced, and cyber attacks, or boosting energy efficiency. And we are going to create an electric-vehicle-charging network across this Nation, as was mentioned many times, including by Secretary Moniz. The private sector is already there and past that. We just need to step up.

Second, the LIFT Act will rebuild crumbling drinking water infrastructure. From Flint, Michigan, to St. Cloud, Florida, in my district, to cities and towns across the Nation, we need to step up to help them. It recently made national news when an attacker hacked into Florida's water system in an attempt to poison the entire community. We need to support—and I am pleased that we are extending this EPA program in this bill. Also, PFAS chemicals are a pressing threat to our community, and the LIFT Act would invest significant sums to help get this out of our water. We even had a cancer cluster in central Florida among our firefighters because of PFAS. So we need to partner with local governments.

Third, the LIFT Act would provide internet access to Americans across the Nation, from precision farming in orange groves in rural Polk and Osceola Counties in my district, to modernizing classrooms in more urban district areas of Orlando and Kissimmee, to making sure we have high-speed internet to learn, to conduct business, to have telehealth, among countless activities that modern Americans face every day. We need to make sure all Americans have access to internet.

And, finally, the LIFT Act will upgrade our healthcare infrastructure. We still have the COVID–19 pandemic, laid bare our waning healthcare infrastructure. The bill improves our workforce capacity, expands laboratory systems and health information systems so CDC and our hospital network can be better prepared for future pandemics.

Secretary Moniz, in your testimony you spoke about the grid upgrades that are necessary to accommodate distributed and clean energy sources. Speaking specifically on solar, which is really important for Florida, what are some grid considerations as more

solar is added to the mix? And what upgrades in investments are necessary to accommodate both utility scale solar as well as distributed solar?

Dr. MONIZ. Well, thank you, Congressman Soto.

Well, first of all, one of the issues with solar, of course, we all know, is that the sun, the sun peaks in the afternoon, and as solar becomes a very, very large part of the grid—and I am very bullish on solar, I have to say—clearly the storage requirements that go along with it will have to be addressed. And as solar is going up—and California has seen this—then battery storage is going to be very important for addressing the intraday storage needs. But we still have some innovation to do for when solar gets really, really big, in terms of also what is called long-duration storage. Days, weeks, and frankly even seasonal may become important if solar is dominant in a system. But this is all manageable. I think the innovation programs need to be pushed hard in that direction.

Secondly, solar has the unique advantage of being able to be deployed at utility scale, at community scale, and at an individual scale with individual housing.

So it is really an extraordinarily flexible approach. But, again, we need to integrate it with storage in these cases, and battery prices falling down really help with that intraday storage. Now, let's get some of those longer-duration storage.

We mentioned earlier pumped hydro is a great solution, but it doesn't work too well in Florida, for example. But there are other approaches, like flow batteries, et cetera, which could be used.

Mr. SOTO. Thank you.

My time has expired.

Mr. PALLONE. OK. Next, we go to Congressman Joyce.

Mr. JOYCE. Thank you, Chairman Pallone, and Ranking Member Rodgers, and thank you for the witnesses for being with us here today.

I am extremely concerned about how the provisions in this bill would affect rural communities like the one that I represent in south central and southwestern Pennsylvania. Many in my district have no access to reliable broadband whatsoever, and this has impact. It has impact on commerce, on healthcare, and particularly now in education.

One of my top priorities in Congress has consistently been to expand services to these areas. Sadly, the direction that this committee is going with the LIFT Act America will only further grow the digital divide and widen the gap between rural and urban America, and not close it.

Commissioner O'Rielly, the LIFT Act would mandate government collection of pricing data, require providers to open their broadband networks to competitors after they build the infrastructure and encourage local governments to build their own networks in direct competition with companies.

Do you think that this can be a model for success?

Mr. O'RIELLY. Well, I think as I have indicated in my testimony, I think it discourages private investment and favors other. By adding new burdens and favoring, you know, competitors from local governments, I think you are a recipe for disaster, and the areas that aren't served today are likely to remain that way. And you

make it more difficult for the private sector to serve and bring benefits.

I think the speed rate of 100 up—my former colleague indicated that cable offers 1 gig, but they don't offer 1 gig on upload. And then too, I would say to that point, is that very few people take that service. So to argue that everybody needs it at that rate and we should pay for it just means that the areas that we should be targeting and that you talked about in your district and the consumers, constituents that need service are not going to get it. We are on the edge. We are at the last 5 percent of America, give or take, to get to the 25/3 threshold.

And I realize it is not ideal in terms of what the future may bring in terms of speeds, but it is getting everybody to a basic level, and we have never gotten there.

I was at 4/1, trying to get everyone to 4/1 and we moved the goalpost, then 10/1 and we moved the goalpost, and now it is 25/3 and we are trying to go to a different place. It means those consumers that you represent that don't have service are going to be further away from getting there.

Now, the idea that you can have one option and it will solve all of the issues: We are on the edge of getting service to those consumers, and the attention and energy-efficient activity will all flow to the new $80 billion program and away from these programs which will be dismantled.

Mr. JOYCE. Mr. O'Rielly, I have seen funding proposals that are supposed to be tech neutral, but they require providers to offer, as we discussed, 100/100 service. That would seem to limit building to fiber builds, and even though, as you have discussed, other technologies might make more sense in some areas, based on costs, where I live, based on terrain, or remoteness. Do you agree that the programs need truly to be tech neutral to ensure that many parts of the country as possible are able to receive this incredibly necessary broadband?

Mr. O'RIELLY. We should use all technologies. The end consumer doesn't mind where the technology is. They want it to work to meet their family's needs. And so to basically say everyone has to have fiber, that is a wrong direction, in my opinion. We certainly want speeds to be as high as we can, but we still have the population, that you represent a portion, that doesn't have service today, and we should be really focused on them like a laser.

Mr. JOYCE. I think that analogy is spot on. We need to have the development and be able to use all forms of technology to provide this service. As I mentioned in my opening comments, we have areas where commerce and healthcare and education are not being served, so being able to utilize all of these is so important.

Again, I thank all of you for being present here today. And I yield the remainder of my time.

Mr. PALLONE. OK. So next, we have Congresswoman Rice.

Miss RICE. Thank you, Mr. Chairman. Thank you all for being here today.

In my State of New York, our hospitals and health systems are among the finest in the world, where our buildings are collectively the oldest in the country. Funding cuts to State and local health departments have undermined their ability to protect the health of

the residents in their communities, and decades of underinvestment in public health left us unprepared for this pandemic.

We simply cannot afford to ignore the needs of the public health sector until the next crisis arises. Adequate and sustained Federal investment in public health infrastructure is needed to ensure that we can protect and improve the health of all Americans. It shouldn't fall upon States alone to make this investment.

So, I am very happy that included in the LIFT America Act is my bill to provide grant funding to State and local health departments for core public health infrastructure needs. Across the country in areas that were hard hit by the virus, like in my district on Long Island, local health departments were on the front lines and played a critical role in providing care to their residents.

I do believe it is in our country's best interests to invest in modernizing our public health systems to ensure that we can combat emerging health threats in the future.

Dr. Frieden, if you could, just talk about how the core public health infrastructure authorization in this bill will help State and local health departments.

Dr. FRIEDEN. What we have seen over the past two decades is a loss of 50,000 jobs in State and local health departments. We have seen data systems that are not up to today's standards and that couldn't manage for the COVID pandemic. We have seen monitoring systems that are out of date, and we have seen a population that lacks resilience. And because of that, mortality was higher, more people died, and economic destruction was higher. There was more than there needed to be.

So it is crucially important that we strengthen State and local health departments. We can do that by not only funding more, but also providing more cohesive staffing with thousands of CDC staff who are embedded for years and learn what the front lines really mean in public health. That is possible through this bill and a health defense operations approach that allows for sustained funding year after year, because the risks are not going to go away and we just cannot keep having this cycle of panic, neglect, panic. We have to get out of this cycle so that we can avoid the avoidable death and economic disruption of infectious disease threats.

Miss. RICE. I couldn't agree with you more. Doctor, can you please tell us what accountability mechanisms are needed so that we can ensure that every penny of Federal resource, that that money is distributed effectively and equitably to local health departments?

Dr. FRIEDEN. So, first off, the CDC works on a system of what are called cooperative agreements that have specific outcome indicators with the recommendation of the health defense operations approach. What we would suggest is specific programs like the CDC influenza program, vector borne diseases, which could be a huge risk for emerging infections, antibiotic risk, food safety, epidemiology and laboratory capacity, which we discussed earlier in this hearing, surveillance, workforce, global health security, public health emergency programs, the Strategic National Stockpile, the Hospital Preparedness Program, and possibly others from Food and Drug Administration and elsewhere.

These are specific lines that have specific accountabilities. And more broadly, we have programs that resolve that every country in the world commit to what we are calling 7–1–7, a commitment that every outbreak is identified within 7 days of its suspected emergence; second, that it is reported, investigation started, and control started within 1 day; and third, that within 7 days, a comprehensive, effective response is established. That kind of approach, that is accountability. We need that in this country and around the world to protect Americans.

Miss. RICE. Thank you, Doctor.

Mr. Chairman, I would like to introduce a letter for the record from a group of bipartisan Senators that supports 100 symmetrical broadband speeds as the baseline for Federal funding for broadband networks.

Mr. PALLONE. Without objection, so ordered.

[The information appears at the conclusion of the hearing.]

Miss. RICE. Thank you. I would like to offer to yield my final 30 seconds to Mr. Wheeler to, if you could, just respond to some of what my Republican colleagues have talked about today that you can address from your perspective.

Mr. WHEELER. Well, thank you for the opportunity, Congresswoman.

The current program has not worked. It has not delivered us rural urban equivalence. And we want to keep doing it that way? We ought to be saying, "Let's spend the people's money the same way that private money is being spent." This whole concept of tech neutrality means tech inadequacy. And it means that there are going to be future hearings asking, Why didn't we do it right the first time?

Mr. PALLONE. Mr. Wheeler, you have got to wrap it up, though, because the time has expired.

Mr. WHEELER. I just did. I am done.

Mr. PALLONE. All right.

Miss. RICE. Thank you Mr. Chairman.

Mr. PALLONE. Thanks.

All right. Next we go to Kelly Armstrong.

Mr. ARMSTRONG. Thank you, Mr. Chairman.

Secretary Moniz, I actually—I appreciate over the last several years some of your comments and statements that have been supporting natural gas as a bridge fuel, and I promise I am not going to put words in your mouth other than direct quotes, but in 2013 before the Senate Committee on Energy and Natural Resources, you stated in broad terms we find that given the large amounts of natural gas available in the U.S. at moderate cost, natural gas can, indeed, play an important role over the next couple of decades together with demand management and economically advancing a clean energy system.

In 2019 before the House Energy and Water Development Appropriations Subcommittee, you stated natural gas in particular will continue to play for some time an important role in providing dispatchable electric power generation in high-temperature industrial processes, applications that are not readily amenable to nonfossil fuel options.

But I think—and I appreciate that, and I am going to give you a chance to answer a couple of questions. We have seen too often—and I can use my colleagues in the House—that we have waged a consistent war, at least since my time in 2018, against natural gas despite its benefits in reducing overall carbon emissions in the power sector.

According to the Department of Energy, between 2005 and 2019 total U.S. electricity generation increased by almost 2 percent while U.S.-related $CO_2$ emissions fell by 33 percent. EIA calculated that, during the same time, $CO_2$ emission reductions from shifts in electricity generation totaled 5,475 million metric tons. Most of this reduction resulted from the increased use of natural gas.

But at the same time, we see the political side of this where we have had a tax on the natural gas production. Last Congress, many if not all of the Democratic Members on this committee voted to ban liquefied natural gas by rail. We have seen all of the litigation and not just in new pipelines but in improving existing pipelines.

So when we talk about methane and reducing methane emissions, one of those factors has to be to replace old pipe that has been in the ground for a long time with new, better pipe and better technologies.

Unfortunately, we see that happen at a way where there is no streamlining to the process, right. We see it with the Enbridge Line in western Minnesota. We have seen it with other lines where you cannot get the new pipeline in the ground without dealing with new permiting. Obviously capacity comes into play, and different litigation moving on.

So how do we—this will be the short question. How do we bridge those two things? That was a long intro to a short question. We know that this is going to be part of the foreseeable future. It has to be because the technology and the buildout of the infrastructure doesn't exist yet.

So how do we do that while streamlining the process and understanding the realities of energy production and what we need to fuel our economy?

Dr. MONIZ. I may have forgotten the beginning of the question by the end of the question, but thank you.

Certainly the quotes—by the way, I certainly own up to the quotes that you said. I do believe that natural gas will continue, will have to continue to be part of the system, particularly as we see the continued acceleration by the private sector of phasing out coal plants to be replaced by a combination of gas and renewables and battery storage. That will continue.

I do think we need to accelerate the introduction of carbon capture and sequestration on both natural gas combined cycle plants and on industrial facilities, but in order to——

Mr. ARMSTRONG. Yes. And just real quick, but that is going to require more pipe as well, right?

Dr. MONIZ. Yes. And I was going to say with regard to infrastructure, number one, industry has to get in there with both feet on suppressing the methane emissions. That is very, very important, both technically and, frankly, politically to do that.

Secondly, using existing rights-of-way I think for a lot of infrastructure, including pipes, is absolutely essential to minimize any kind of eminent domain and public opposition.

Mr. ARMSTRONG. And eminent domain law is different in every State, right? Like, North Dakota doesn't have it unless you are a common carrier.

Dr. MONIZ. It is different in different States. There are—without getting into it, the 2007 Energy Security Act did provide DOE with some eminent domain authorities when it overlaps with some of the power marketing administrations.

But the other thing on infrastructure—and as much reutilization of infrastructure as we can get is important also, in what is a likely natural gas to hydrogen transition when you look down the road 15, 20 years.

Mr. ARMSTRONG. Well, I appreciate that. If you can figure out how we can deal with the reutilization without numerous lawsuits and permiting hurdles, I am all in.

And with that, I yield back.

Dr. MONIZ. Can I just add one thing? For example, we could already now start to move some component of hydrogen and renewable natural gas in natural gas pipelines. We could do 5 percent, maybe 10 percent. So we could start introducing this right now with existing infrastructure.

Mr. PALLONE. All right. Thank you.

Now we go to Angie Craig.

Mrs. CRAIG. Well, thank you so much, Mr. Chairman, for holding this important hearing. There is really no bigger topic we can take on next than revitalizing our Nation's infrastructure and economy. Thank you to our panelists for being here and sharing your expertise as well with us today.

Closing the digital divide between our urban and rural communities is one of my top priorities. As a Member of Congress, I have the great honor of representing a district that is part urban, part suburban, ex-urban, and rural. High-speed internet access is a lifeline to education, to healthcare, and to economic opportunity.

LIFT America increases broadband infrastructure development from 40 billion in full-year 2020 to nearly 80 billion for 2022 to 2026. For my constituents in rural communities, broadband access can mean access to potentially life-saving telehealth services, particularly within the realm of mental health services.

So my first question is to Mr. Wheeler this afternoon. You launched the Connect the Health Task Force during your time at the FCC which studied the link between broadband and health. In your testimony, you mentioned the need for internet access to sign up for a COVID–19 vaccine, but in your view, what are some of the other ways that broadband impacts healthcare delivery and access? And what do you personally hope we maintain, having come through this public health crisis, that we have learned as we move to the future of telehealth?

Mr. WHEELER. Well, thank you, Congresswoman Craig. I mean, you are right. And credit needs to be given where it is due. It was Commissioner Mignon Clyburn who took on the personal responsibility on that telehealth task force. And I was privileged to travel

around the country with her and see how technology is being put to work. There is a very simple issue here.

The doctors are here. The people are here, OK. We have to be able to connect them. We can't connect them with yesterday's slow speed technology, the kind of technology that we have been seeing hiccups with today. You can't have that happen in the middle of an exam. We need to have quality connectivity between the doctors and the patients so that, wherever you are, you get quality telehealth services, and that is based on quality broadband connectivity.

Mrs. CRAIG. Thank you so much, Mr. Wheeler.

Dr. Frieden, I want to turn to you. As you noted today, COVID–19 has also laid bare decades of underinvestment in our country's public health infrastructure. In my home State of Minnesota, community health centers serve around 200,000 people annually and employ over 1,700 full-time staff.

Centers like Open Door, which operates a dental clinic in Jordan, Minnesota, provide an invaluable service to our patients and our community. The $10 billion in capital project funding authorized by LIFT America would provide clinics like Open Door with the ability to expand their facility and their services to reach more patients in my district.

Dr. Frieden, can you expand on the importance of capital project funding at the community level and why such funding must be predictable moving forward?

Dr. FRIEDEN. This is really important, and it goes into the bigger issue of strengthening primary care. We spend, last I saw, more than $3.5 trillion a year on healthcare, and we get worse health outcomes than any other high-income country. We live 4 years less with more disabilities, and we pay more. We are a negative outlier.

And earlier I mentioned some data I sent around, that we will send around after, that demonstrates that part of the fix has to be strengthening primary care systems, and community health centers are a critically important part of that effort.

Now, community health centers don't have the kind of access to capital that hospitals have. Community health centers serve communities—urban, rural, generally underserved. It is crucially important that they have additional funding so that they can serve more patients.

Mrs. CRAIG. Well, thank you so much, Dr. Frieden. And as a new member of the committee, I am going to yield a whole 15 seconds back to my chairman before——

Dr. FRIEDEN. If I can just take 2 seconds of that to say it has to be sustained because it can't be just one time. It needs to be continuing support. Sorry.

Mrs. CRAIG. That is OK, Dr. Frieden. Thank you, and I yield back.

Mr. PALLONE. Thank you.

Next is John Curtis.

Mr. CURTIS. Thank you, Mr. Chairman, and thank you to our witnesses. It is amazing that you will sit and stay with us this long.

I would like to spend my time talking about the digital divide issue, broadband. I too have a district that is urban and rural, but

I think I bring a pretty unique perspective to this discussion. And that is several years ago, almost a decade ago, I was a mayor of a city, and we had tried as a municipal government to bring broadband into our city. As a matter of fact, my predecessor spent more per resident than this bill does, if we put it on a per resident basis, and we failed. I took over a failing network.

By bringing the private sector in, we were actually able to offer gig speed—now, remember, this is nearly a decade ago, gig speed was a big deal back then—for about 70 bucks per resident. But more important, every single resident in my city had free internet and free connection to that internet.

Well, how did we do it, and what did we learn? Well, we learned that government is ill equipped to deal with the fast-changing nature of technology and especially broadband. I have heard today pay it once, get it right for the first time. My experience says you can't do that with this. It is changing so fast and needs so much continual investment that government can't come in and write a check and be done with it.

From my experience, and I think if we are all honest with ourselves, we know by the time the money is spent in this bill, if it is passed, the technology that we are spending it on will be out of date. It is just the reality. Seven years ago, we made national news by having a gig speed as a city. Today, we look back, and we kind of laugh at that gig speed.

Mr. O'Rielly, what is your experience, and who is best equipped to deal with the fast-changing nature of broadband: government or private sector? And let me acknowledge I think both have a role, but are we overlooking the valuable role of the private sector here today?

Mr. O'RIELLY. Yes, I would agree with you. I think it is both a private-sector role and a government role. And I spent time in the Government at the FCC working on these issues and working to make sure that the private sector can deploy the network as far as it possibly can and, in those areas where the market wasn't succeeding, how do we differently design those subsidy programs to entice them to serve the other portion of the population that is not being addressed today.

And each market is a little different, you know. We have done this through reverse auctions, which I helped lead at the Commission. And so I think, you know, we have learned an awful lot through the process, and we are fine-tuning it. And we are finally down to the last 4, 5, 6 percent of the population that is really hard to serve, that is not necessarily always in the urban centers that you represent.

Mr. CURTIS. Yes. So my district——

Mr. WHEELER. Can I talk about——

Mr. CURTIS. Mr. Wheeler, I have got a very limited amount of time. Mr. Chairman, please help me out here. This is my time, and I have got just a precious little bit of it.

Mr. PALLONE. The Member should only address your response to the people who have been addressed to. Thanks.

Mr. CURTIS. So my district would represent what you are talking about. We have done an amazing job of getting a good gig speed

into much of my rural district. It is that last little bit of it that we are just not done with.

Now, I am attending this hearing today in a different location. I have got at times as much as—as little as 4 megs up—excuse me—4 megs down and 10 up, and I had no problem with this hearing. So I don't want to waste my time on this, but I want to emphasize what my colleagues have said, that we don't need 100/100 to get what we need to do here.

Now, my last question, Mr. O'Rielly, is can we get fiber broadband to every American household without permiting reform? In my district, it takes 9 years to permit across Federal land. Are we missing the point here? I know it is not the only part of our problem, but are we missing the point, and what do we need to be doing with regulation?

Mr. O'RIELLY. I fully agree that a number of legislative efforts that the committee members have introduced should be part of any package. The number of burdens that have been placed on industry on the permiting side, on the cost side, on terms of the environmental regulations, and then Federal lands slows down projects considerably and prevents the deployment that you just spoke of. And so to get those things to happen——

Mr. CURTIS. I have got just a few seconds left. Let me make this point. As a mayor, I also learned that when we brought in and did an infrastructure project, if we spent $1 of Federal money, it increased the cost of our project by 30 percent because of the excessive regulations.

If we want to give a 30 percent discount, right, to this project right off the top, let's figure out how to get Government to be more cooperative with State and local governments in their efforts.

Thank you, Mr. Chairman. I yield my time.

Mr. PALLONE. Thank you.

Next is Lizzie Fletcher, Congresswoman Fletcher.

Mrs. FLETCHER. Thank you so much, Chairman Pallone, for holding this hearing today, and thank you to all of our witnesses for your testimony. Your insights about the challenges and opportunities before us in this moment and then in this infrastructure legislation have been really, really useful. And there are so many issues to cover, but I would like to use the few minutes I have to talk about some of the issues that are priorities for my constituents here in Houston.

Perhaps it is not a surprise, then, that I will direct my questions primarily to you, Dr. Moniz. In your written testimony and during the hearing today, you have talked about the importance that carbon capture utilization and storage will play in meeting a midcentury net-zero goal. And this is an area of great interest here in Houston. There is large-scale support for CCUS. I have met with a number of my constituents and folks who are actively working in this area right now. We worked hard to address some of the 45Q tax credit guidance in the last Congress.

And here in Houston we are really well situated to lead the way in the technology with our industrial presence, the existing pipeline infrastructure, and our geology. But despite all this interest in all of this work, we just haven't seen the kind of deployment that we need to meet our carbon reduction goals.

So in your testimony you say that in order to create a large-scale $CO_2$ management infrastructure, there need to be new regulatory frameworks with additional financial incentives. So I would like to hear your thoughts about sort of whether and how Congress should assist in this process, what the framework would look like, and what funding mechanisms you think would be most effective for these critical projects?

Dr. MONIZ. Thank you, Congresswoman Fletcher. First of all, of course, as you know very well, your region would be an excellent place for one of those combined hydrogen $CO_2$ hubs that I mentioned. With industry, with $CO_2$, you already have hydrogen, not very far away, serving refineries and the like.

In terms of the need, the incentives, well, one of the things is I would say the DOE CarbonSAFE program to characterize major $CO_2$ sequestration hubs could be supported more strongly and expanded in scope. That would be one thing.

Secondly, I think, I appreciate, especially in the work of the Energy Act of December in terms of extending the 45Q tax credits. Frankly, I think more could be done there because, in particular, to push the CCS on NGCC plants, I think we need a little bit more oomph. But the other thing is I think that we need to really get together in a strong push to UCCS right now across much more of the industrial sector. That is where you have much more low-hanging fruit, some of it in Texas, some of it elsewhere. For example, in California we found that all four ethanol plants right now would be in the money if they put CCS on those plants.

Third is, again, this issue of permiting. There are—in my view, we are going to have to move ultimately when we start talking about very large-scale CCS to addressing the long-term liability issues. I believe we are going to need third-party players. I mentioned a possible utility model for $CO_2$ disposal. Well, when you are doing that, you have to have some insurance approach to the long-term liability issues to turn it over to a third party.

So those are a few examples. There is a lot could be done, and of course, also in December, with the authorization of six major CCS projects, it is really time. It is really a good time to really implement those because we need to show how those work in both the power and in the industrial sector, in my view, by 2030 so that they are ready to really scale in the 2030s.

Mrs. FLETCHER. Terrific. Thank you. And one followup question in the few seconds I have left. You mentioned earlier in your testimony, I think in response to a question from Mr. Sarbanes, about the need for direct removal or direct air capture. And that seems like a critical part of the path forward. Can you talk a little bit just about how you envision that direct removal and what we can do in Congress to facilitate that as well?

Dr. MONIZ. Yes. I think this is an enormously important area. Congress did add almost $100 million to CDR last year, but we estimate a $10 billion RD&D program over 10 years as needed. I want to emphasize it is not only direct air capture, it is many other approaches as well: terrestrial, mineralization, upper layers of the ocean getting more alkalinity in the ocean. It is a broad program and very, very high priority, in my view.

Mrs. FLETCHER. OK. Well, thank you so much, Dr. Moniz. I have gone over my time.

So, thank you, Mr. Chairman. I yield back.

Mr. PALLONE. Thank you.

So now we go to Buddy Carter.

Mr. CARTER. Well, thank you, Mr. Chairman, and thank all of you for being here. This is certainly an important hearing, and we appreciate all your expertise.

Mr. O'Rielly, I want to start with you. In preparing for this hearing, I reviewed this legislation and this bill, and I reviewed it with my staff as well. I am having a little bit of trouble, and I wanted to know if you could help me understand exactly what digital equity means. It seems like it is very broad to me. It seems like it includes not only speeds but devices, applications, contents, digital literacy, and a whole lot more. And I just want to know if you can articulate for me exactly what digital equity is?

Mr. O'RIELLY. Well, I think the term is intended to be very broad to meet a population that may not be a subscriber today or may not be a user and to bring them online and to deal with all of their potential needs, and you are right. As I read it, it deals with devices and literacy and a bunch of different components all tied to one.

Mr. CARTER. Is there a clear understanding of what the Federal role should be in any kind of digital equity program?

Mr. O'RIELLY. Well, I have to defer to those that are still in the roles, but I don't know that I can exactly determine where this money would go or how you would spend it. I worry that it could be, you know, misused or could go to some really suspect programs. We have done that in the—we had that in the 1990s. There were a couple different programs not exactly called digital equity, but they connected a number of different communities.

Some of it was wasted, and you know, some of it just didn't go for what was intended. And so I think it was very—you know, it can be vague, and I don't want to criticize the intent, but I think that there is some—it certainly could be addressed.

Mr. CARTER. And, you know, I have to say I believe it is intentionally vague, just for that reason. You know, I am not trying to question anyone's intentions here, but I do believe that is the case. Don't you think that language like this, could it potentially—the $1.3 billion digital equity program, could it potentially prevent it from simply replacing the Lifeline program or the Emergency Broadband Benefit program by just subsidizing the cost of internet?

Mr. O'RIELLY. Well, it could be a source for that purpose. It can also do everything else that those programs don't do, and you can have this big, huge package of services, potentially. I don't know exactly what could go in the space at the current moment.

I will tell you this, though. As a former regulator, as I read it fairly broadly, and I can see where you can, you know, basically spend the money anywhere you want to and make up an argument for where the money should go. And that doesn't mean it would be wasted, it just means that you could—you know, when the Congress writes very broad language, it gives a regulator broad authority to kind of interpret where it wants to go. If it is just that is

what the goal is, well, then, that is the public policy decision being made.

Mr. CARTER. Well, and that is what concerns me because I feel like we defer too many times to the agencies and don't make our intent clear. So that is why I am concerned about this because I think it is extremely broad, and I think it leads to what some people may interpret to be waste. And we need to be more specific, and I just think that we are falling down on our responsibilities as Members of Congress to do just such. So let me ask you—go ahead.

Mr. O'RIELLY. I fully support addressing affordability, and I think there are ways to go about it, and Congress has looked at some of that in a bipartisan way in the EBB program. I couldn't agree with you more that the more specificity Congress can provide, the better. And as to which way he wants to go, even as a former—even if I disagree, it is irrelevant. Congress has decided.

Make it as specific as you want to. That helps the agency. It just is a decision you make, and the agency can bless it rather than trying to guess what the interpretation should be and going down roads that it wasn't supposed to go.

Mr. CARTER. And I couldn't agree with you more. And I could name numerous, numerous examples of where we have done just such. So, listen. One last thing before my time's running out here, but this act proposes a number of different concerning changes for me such as redefining underserved areas. What do these changes mean for satellite and fixed wireless connections? And because of those changes, ultimately what do they mean for consumer prices and competition?

Mr. O'RIELLY. Well, I think, you know, as defined by people who advocate for it, they want it to be fiber and to exclude all other technologies. And so in terms of competition, there necessarily wouldn't be—it will be either fiber or not. Maybe in some places, there would be multiple fiber providers, but really, you wouldn't see competition, and you would have to—you know, and that would be—you know, then they would regulate the rates and different things to try and keep the rates down through government means.

Mr. CARTER. Great. And that is all my time. Thank you all. Thank all of you, and especially you, Mr. O'Rielly.

And I yield back.

Mr. PALLONE. Thank you.

Next is Dr. Kim Schrier.

Ms. SCHRIER. Thank you, Mr. Chairman, and thank you to our witnesses. This is such an interesting discussion.

The LIFT Act highlights the need for electric vehicle charging infrastructure in low-income neighborhoods, but we also need to support the demand for those charging stations with vehicle exchange programs for older, more polluting vehicles and providing secondary market credits to make electric vehicles more accessible. And I think it is important to remember that right now about 60 percent of electric vehicles are purchased by people with household incomes above $150,000 and most Americans right now are not in the market for a new car, so we have to drive down emissions everywhere, especially in areas of disproportionate impact and public health concerns. And we have to remember also that electrification for many areas means transit, schoolbuses, even reducing emis-

sions from medium- and heavy-duty vehicles which represent a quarter of emissions but only 7 percent of vehicles.

So, Secretary Moniz, how can we better engage with underserved communities? Given this understanding and given our concerns about equity, how can we also incentivize the purchase of electric vehicles, including used ones, so that people in all income brackets have access?

Dr. MONIZ. Well, thank you, Congresswoman Schrier. First of all, I would like to point out that I think you put your finger on a very important point, and that is a focus not only on the, say, light-duty vehicles but on the fleets that are operating in urban environments all the time. It would be very important, and often that would certainly help some of the underserved communities, particularly in these urban areas. And with the reduction of battery costs, that has been very, very substantial. As I have already said, on light-duty vehicles we will be seeing—I think we have already seen cost parity in terms of lifetime costs, but we will be seeing equivalence as well in the capital costs within years. That also applies to the kinds of fleet vehicles, especially because they have big advantages in their charging infrastructures.

Now, in terms of the light-duty vehicles, first of all, you are absolutely right that the turnover issue is an important one. And the incentives that we have had so far for purchase of EVs, to be perfectly blunt, has favored more well-off people because up to now the capital cost has been higher. We need to incentivize it. We may need to have other Cash for Clunkers kind of programs, help with the turnover.

People driving less in COVID is going to extend the life of the current vehicles. So I think you are right. Incentive programs targeted more at the underserved communities would be welcome, but then we have to be creative on the charging infrastructure because the suburban model is not the one that is going to work.

Ms. SCHRIER. That is right. And, of course, attention to public transit. Thank you for talking about the delivery vehicles. We have a bill for the U.S. Postal fleet. We have heard about FedEx. I really appreciate those comments as well.

I am going to turn to Dr. Frieden really briefly here because, again, in the context of underserved areas, I am thinking about hospital deserts, even within urban areas, even like in Washington, DC. This is sort of like grocery store deserts, and as we think about the impacts of COVID–19, I am concerned about how many hospital beds we have per capita in this country compared with other nations, what that means for underserved or unserved communities.

And so I was wondering, Dr. Frieden, if you could talk just a little bit more about the importance of investing in the physical infrastructure of the healthcare safety net and how those communities could benefit from modernization and maybe how that could impact health disparities.

Dr. FRIEDEN. Well, first, there are clearly hospitals in great need. Those include both rural hospitals and some hospitals in central cities that don't have the kind of revenue streams that others have. But unless we do a much better job at prevention and public health, we will never be able to build enough hospital beds. We

have an aging population with more morbidities like hypertension, diabetes, and we have to fix primary care. We have to fix public health, and that is the route to both a more productive and a healthier population.

Ms. SCHRIER. Thank you. As a primary care provider, I appreciate those comments.

I yield back.

Mr. PALLONE. Thank you.

Next is Congresswoman Trahan.

Mrs. TRAHAN. Thank you.

Thank you, Mr. Chairman, and the committee for convening this important hearing. I really appreciate the witnesses' time today, your depth of knowledge and insight.

You know, my district is home to the first community health center sponsored residency in the Nation, Greater Lawrence Family Health Center, which offers primary healthcare to more than 62,000 patients in my district. Centers like these across the country are doing double duty, responding to the COVID–19 pandemic while also training medical professionals who will go on to serve the most vulnerable in our communities.

The pandemic highlighted the need for our country to rethink and be creative about the way we provide healthcare, especially to areas that serve high proportions of low-income and minority patients, rural areas, and the areas that operate Tribal or urban Indian health programs.

The LIFT America Act authorizes $500 million in grants to support the improvement, renovation, or modernization of infrastructure at teaching health centers and behavioral health centers. These grants could mean state-of-the-art teaching equipment, long-overdue building repairs, and even renovations that expand capacity.

Dr. Frieden, can you speak to the importance of infrastructure investments in qualified teaching health centers and specifically how these investments could lead to a future healthcare workforce prepared to care for historically underserved populations?

Dr. FRIEDEN. Well, the issue of graduate medical education and funding of medical centers is a complicated one, to be frank, and I think what we see is that many of these centers perform a huge amount of service for populations that aren't adequately served otherwise. And we don't have really a sensible business model for that, a sensible way of paying and assuring quality and continuity of care.

I was encouraged to see the mental health provision in that because mental health is neglected, and it is really important. If you look at disability, if you look at suffering, there is a lot of mental healthcare that is needed and not obtained. There is something in mental health, what is often called the rule of halves. Only half of people are diagnosed. Only half of those are adequately treated.

So support to our behavioral health colleagues is extremely important. And for all of these, we have to strengthen primary care, including primary care systems that work as teams and have a mental health professional as either a virtual or a present member of that team.

Mrs. TRAHAN. I really appreciate that. That was actually my second question in terms of improving the infrastructure of behavioral health centers and increasing access to treatment for addiction, so I appreciate, I appreciate you tackling both questions all at once. I am really excited that the LIFT Act could mean that quality and access to healthcare in this country will improve.

I think I have time to actually switch gears and ask another question. I know it has been touched upon several times in this, but my district is home to passionate entrepreneurs that combine world-leading research from MIT and Boston College, Secretary Moniz' alma mater. With the work ethic of the Merrimack Valley, which is, you know, the start of the industrial revolution, they are developing inputs to the green economy, magnets for offshore wind, powders for batteries, and new energy storage techniques.

But one challenge these innovators face is that, even when their processes are more environmentally sustainable, they struggle to build components at a price that is competitive with overseas suppliers, and many times they struggle to even source those inputs from the U.S.

So, Secretary Moniz, with my remaining time, in your testimony you emphasized that, as the market for electric vehicles increases, the global battery manufacturing capacity and number of public chargers need to increase by an order of magnitude. Beyond permiting, which is also something you mentioned, can you describe other ways we can improve and expand battery manufacturing in the U.S., including by developing complementary policies that might incentivize domestic battery manufacturing?

Dr. MONIZ. Well, again, Congresswoman Trahan—by the way, and I am from Fall River, not Lawrence, but anyway—as I mentioned earlier, there are DOE programs that already have been used and could be reenergized, if you like, to help with battery manufacturing. But there are huge also supply chains there, cathodes and anodes, et cetera, where I think the kind of entrepreneurial activity that you are referring to will come into play.

Now, I personally believe—and this is always tricky, but I personally believe that we need to develop, without prejudging the answers, but we do need to develop not necessarily a made-in-America-only strategy but something that takes into account the security of critical supply chains. And there is no doubt that batteries, for example, are one of the areas that is critical.

I think in my testimony it points out that today battery manufacturing is only 10 percent in the United States. I mean, China is the biggest market right now, but not by that kind of a margin. And so it has been very welcome to see more manufacturing coming into the United States, but we need more of it.

Of course, creating the market is ultimately the answer. And that is where, with the announcements of GM and Ford and the history of Tesla, many new models coming into the market, including foreign suppliers with U.S. manufacturing plants, if you have got the market here, I mean, that really provides an enormous incentive for the supply chain to be here as well.

Mrs. TRAHAN. Yes. I couldn't agree more. I know I am over my time. I appreciate all of that. Thank you.

I yield back, Mr. Chairman.

Mr. PALLONE. Thank you.

Next we go to Robin Kelly, Congresswoman Kelly.

Ms. KELLY. Thank you, Mr. Chairman, and thank you for holding this hearing, and I want to commend you for putting together this legislation to make long-overdue investments in our Nation's infrastructure. This holistic approach will allow America to modernize our system and improve the delivery of healthcare, energy, and the internet.

As we have all adjusted to online and remote work, we have seen just how important connectivity is to education and healthcare. Historically, as we know, rural and low-income urban communities have lacked access to high-speed connectivity. It is perhaps not surprising that companies have invested the highest speed and more reliable networks in wealthier communities, but this is where the Government can and must step in. As more and more essential services are offered primarily or wholly online, it only exacerbates the divides that already exist in healthcare, education, and commerce.

Commissioner Wheeler, as companies build out the next-generation high-speed networks, we cannot let these communities that were left behind during the last upgrade be left behind again. Are there provisions in the LIFT Act that will address these disparities and ensure that they are not repeated?

Mr. WHEELER. Thank you, Ms. Kelly. That is a spot-on question because what we need to be doing, and I think what the LIFT Act is trying to do, is to focus on fiber so that you build once and don't have to come back and rebuild later so that some segments of society have to play catchup ball.

There is in my testimony a chart that shows the growth in computing power, which is Moore's law, which we all are familiar with, and the growth in fiber throughput called Keck's law, which parallels it.

And so, if we want to talk—and the question was raised, the statement was made a while ago about use the money wisely. If we want to use it wisely, we ought to spend it as wisely as the companies are spending their money, which is to build fiber. Because once you have got fiber in the ground, then it becomes a matter of the electronics at both ends and the increasing throughput capability of fiber, and that is how you keep up.

So your question is spot on, that it is possible with this kind of an authorization based on the study that we did to have every home in America wired with fiber to futureproof for tomorrow and have no second-class service.

Ms. KELLY. Thank you. Last Congress, I introduced H.R. 2119, which amends the energy policy of 2005 to increase the authorization for a grant program that was set up to provide grants for States to improve the energy efficiency of public buildings and facilities. That provision is included in the LIFT America Act we are considering today. State and local communities often lack the financial resources to undertake large-scale efficiency retrofits for public buildings. This grant program makes it easier for States to make these investments, which in turn lowers the utility bills for the community operating the building.

Mr. Secretary, do you agree that making our public buildings more energy efficient is effective at improving our energy structure? And is there a role for DOE to play in supporting States and local communities who may lack the resources to retrofit public buildings? Thank you.

Dr. MONIZ. Yes. Absolutely, Congresswoman Kelly. We have strongly advocated, in fact, as an example, a program where the DOE could award, if there were the appropriations, of course, energy efficiency upgrades to the hundreds of thousands of public buildings at the State, county, and local level. This would be—often, as I think you know, the funds are not there without some help. This would be great for jobs. It is jobs immediately. And, of course, we hope we are coming out of COVID now, but still there is going to be some residual reluctance, I think, in many families of having workers coming into the home. We hope that is overcome soon. But that problem doesn't exist for these public buildings, which often will have at least one shift of the day, if not two. They are prime real estate for efficiency upgrades, so that could be a very, very important program.

Ms. KELLY. Thank you so much, and I yield back.

Thank you, Mr. Chair.

Mr. PALLONE. Thank you.

Next we have Scott Peters. I don't know if he is available. He was there. He was on before, but I—well, we can go to Yvette Clarke and come back.

Congresswoman Clarke? She is on mute. I don't know if she knows that we are asking for her.

Ms. CLARKE. I am trying to unmute.

Mr. PALLONE. OK. That is good. I can hear you.

Ms. CLARKE. OK. Can you hear me now?

Mr. PALLONE. Yep. Yes.

Ms. CLARKE. Thank you very much, Mr. Chairman, and let me thank you and Ranking Member Rodgers for convening this very important hearing on the committee's LIFT America infrastructure proposal.

As our Nation battles with interrelated crises around COVID–19, the economy, racial injustice, and climate change, I believe we have a unique opportunity to meet the magnitude of this moment with bold legislation that will finally lay the groundwork for a 21st century America that prioritizes workers, safeguards our climate, and addresses the deep racial and economic injustices that have persisted in our Nation for far too long.

I am excited about the fact that we recognize now that it is time for us to turn the page on our 19th and 20th century infrastructure and build a new infrastructure worthy of the 21st century. It is my hope that we can use this legislation as a starting point to work with the administration and with our colleagues in the Senate to create a forward-looking infrastructure and recovery package that allows us to truly build back better.

Secretary Moniz, you mentioned in your testimony how the deployment of public EV charging stations will need to scale up by orders of magnitude to meet the widespread adoption of electric vehicles over the coming decade. And I agree with your assessment, but I also think it is crucial that we keep equity at the forefront

of this conversation. History has shown us that, unless we are intentional in our actions, the communities who have the most to gain from new clean technology, particularly in terms of environmental and public health benefits, are often the last to receive the least investment.

So, Secretary Moniz, do you agree that we should also be focused on equity and access as we look to increase the deployment of EV charging infrastructure in communities across our Nation?

Dr. MONIZ. Absolutely, Congresswoman Clarke. As you said very well, these are our communities where cleaning up the air would have a particularly important effect in these communities, so absolutely.

On the charging stations, it will take creativity, given the patterns of multifamily units and the like, but that can be managed. As we also discussed, there has to be incentives as well for being able to introduce the vehicles and the delivery vehicles, et cetera, in those areas.

Also, if I may comment—and this is a comment to you but also to the chairman—that I really appreciate your emphasis on a 21st century infrastructure. We have heard in this hearing a lot about, you know, the EV charging infrastructure. We have heard about the broadband. The reality is this is a bill focused on going to where the puck is going to be, and that is what you need to do on infrastructure. You build for 15 years out or 20 years out. You don't build for tomorrow.

Ms. CLARKE. Thank you. And I am so pleased to see that so many major pieces of my Electric Vehicles for Underserved Communities Act co-led by Congresswoman Barragán is included in this infrastructure package. Not only does building back better mean ensuring a strong focus on equity and justice, it also means building back smarter, and that is something that I have prioritized as cochair of the Smart Cities, Smart Communities Caucus.

And I am also focusing on my Smart Cities, Smart Communities Act with Congresswoman Suzan DelBene, which is part of the LIFT America package. Our proposal would establish a pilot program to generate partnerships between DOE, the national laboratories, and communities seeking to leverage smart cities technologies.

Secretary Moniz, do you agree that communities across America could benefit from increased collaboration with DOE and the national labs to better facilitate research, development, and deployment of smart city technology?

Dr. MONIZ. Yes, absolutely. And, in fact, we say in the testimony that, when we think about smart cities or smart communities, the real focus has to be on what we call the backbone. The backbone is kind of coherently developing smart electricity with telecom, linking it to big data analysis, AI, and then the people of that city and the people who are attracted to that city will exercise all kinds of entrepreneurial juices to use that backbone. And, of course, the DOE and the laboratories are steeped in those technologies.

Ms. CLARKE. Thank you very much, Mr. Secretary.

I thank you, Mr. Chairman, for this hearing, and I just wanted to say to Dr. Frieden that I couldn't agree with you more about the need for us to build out a 21st century public health infrastructure.

What we experienced here in New York City as the outbreak epicenter of the pandemic, knowing that we had one of the strongest public health infrastructures in the Nation at one point in time and to see that we weren't prepared, that we really had a flawed system, is a dear price that we had to pay, and I hope that we'll look at the need for a national public health infrastructure.

And thank you for all of the work that you all do. And I yield back, Mr. Chairman.

Mr. PALLONE. Thank you, Congresswoman.

Let's see. Several Members have come back. I think the next one is Scott Peters.

Mr. PETERS. Thank you, Mr. Chairman. I appreciate the irony of having the internet difficulties during this hearing, but thank you for holding it.

And as we have heard from Secretary Moniz today, modernizing the energy infrastructure is a vast undertaking that includes expanding and upgrading long-distance high-voltage transmission systems, building out $CO_2$ pipelines and calls for $CO_2$ storage, scaling up hydrogen technologies for use in transportation and power generation, rolling out EV stations, decarbonizing natural gas systems.

The LIFT Act and its companion, CLEAN Future Act, takes significant steps to address these critical infrastructure challenges and ratify that part of that discussion has been based on the Power On Act that we drafted to develop an interstate high-voltage macrogrid.

Secretary Moniz, you have discussed the concept of collecting energy infrastructure around hubs. And I believe I was actually talking this week about the concept with Peter Fox Penner of Boston College, who I believe works with you. The notion involves integrating the various energy systems.

The 2021 National Academy of Sciences report concluded that building a national hydrogen pipeline network will play an essential role in meeting a zero-emissions target by 2050. And in appropriations we have supported for hydrogen—we provided support for hydrogen pipeline research at DOE.

But could you explain a little bit more about how the energy infrastructure hubs might work and how that might look to lay people like us and specifically about colocating hydrogen and CCUS hubs and how that might accelerate the hydrogen economy?

Dr. MONIZ. Yes. Thank you, Congressman Peters. Am I on mute? No. I am OK.

In fact, let me start by saying that one of the studies we did was specifically for California CCS. And what it showed there, there were about three natural hubs in the State where you could really focus on the infrastructure in those hubs without having to worry about, at least, initially, you know, a macro infrastructure cutting across everything.

And, of course, it is not only carbon dioxide. But if you look at—like, one of those hubs involved, you know, the Long Beach Port. And clearly using hydrogen in that port, electrifying the port would be a tremendous step forward. So, really, a comprehensive hub of that type.

As we looked around the country—and that was the figure in the written testimony—looked around the country, we saw similar kind of accumulations of large industrial activities with the opportunities for sequestration, with the opportunities for supplying hydrogen to those industrial facilities, possibly to the power facilities, and utilizing to the extent possible.

That is where, by the way, your support for research on hydrogen pipelines is really important because the extent to which you have perhaps pipeline structures that could employ at different times, of course, $CO_2$ and then hydrogen could be a very, very efficient way of doing the infrastructure evolution.

Mr. PETERS. Do you have a sense that the bill before us will adequately accommodate and promote the development of energy infrastructure hubs as you imagine, or should we make changes and amendments to it?

Dr. MONIZ. I think it could be strengthened. I think it is an important organizational concept. And as I said earlier, one way would be also to focus on a Federal program to, in some cost-shared way, develop two or three, at least, of these regional hubs, certainly in this decade.

And that would—you know, doing by—I mean, doing by example would be a tremendous way for the committee and the Congress to get this kicked off.

Mr. PETERS. We would like to follow up with you and your organization offline to sort of come up with ideas we can offer up to the committee.

I also want to comment, real quickly, on methane emission strategy. The EU commission wants to review, obtain substantial reductions by 2030. And it is interesting that the French Government blocked a domestic company from signing a $7 billion contract for liquid—LNG from a facility in Brownsville, Texas, because U.S. natural gas was too dirty.

So there is an economic incentive to deal with this. Could you elaborate on what kind of future policy and regulations you have in mind for managing emissions from a natural gas system?

Mr. MONIZ. Well, first of all, I think the industry has got to be full in on getting methane reduced, but there are also new technologies. For example, you can do electric drilling. That is being advanced. So we think—for example, on LNG specifically—and I was part of a project that was looking at the architecture—we think that you could do a net-zero LNG facility from wellhead to dock, for example, you know. These are the kinds of initiatives that we need.

The LNG exports, I think, remain very critical for our allies, and so I think going domestically to net zero would be a very, very good move.

Mr. PETERS. Well, we will look forward to discussing that more with you. My time has expired.

Mr. Chairman, I yield back.

Mr. PALLONE. Thank you.

Next we have Congressman Bobby Rush.

Mr. RUSH. Thank you, Mr. Chairman, and hello to our witnesses. Good to see you all again. Dr. Moniz, Dr. Frieden, Commissioner O'Reilly, and Commissioner Wheeler, it is certainly good to see you

all again. And you all have really passed the durability test for today, and I want to thank you so much for your fine testimony.

Last week, in a shocking analysis, the Chicago Tribune recently found—and I quote—that "more than 8 of every 10 Illinoians live in a community where brain-damaging lead was found in the tap water of at least one home during the past 6 years," end of quote. The analysis also found that Illinois has more service lines made of toxic metal than any other State.

Mr. Chairman, I ask for unanimous consent to insert an article from the Chicago Tribune explaining their analysis into the record.

Mr. PALLONE. Without objection, so ordered.

[The information appears at the conclusion of the hearing.]

Mr. RUSH. Fortunately, the LIFT Act includes $4.5 million for lead service line replacement, with a priority on environmental communities.

Dr. Frieden, can you speak to the reason why replacing these pipes should be a top priority for public health and safety?

Dr. FRIEDEN. Thank you very much, Congressman, and thanks for raising the issue.

Lead poisoning remains a significant problem, not just for kids but also for adults. There is growing evidence that it increases blood pressure and has other health effects among adults. It is a toxic chemical, and we want to get it out of our environment. That is going to take work. Water is one of the sources. Had we done a better job of controlling lead paint, what we are seeing is the residual sources are showing up, and that includes lead service lines.

Lead service lines and lead poisoning have long-term negative consequences on a child's development, and the modelling studies suggest that those consequences have very large economic and educational impacts in terms of the productive capacity of that individual, the societal costs that they will contribute to or require in their lives.

So eliminating lead poisoning is not only an inspiring goal but it is possible, and efforts to do that by addressing all of the sources, including water, are important.

Mr. RUSH. Thank you.

Secretary Moniz, today's legislation also invests over $100 million in clean energy, energy efficiency, clean ports, smart communities and electric vehicles. Investments of this magnitude and in these areas support our role of creating a cleaner economy with high-quality, good-paying jobs.

Secretary Moniz, during the recent pandemic, the U.S. Energy sector established the USEER report, and I want to thank you for energy-fueling initiatives for this USEER report. Considering your work, sir, will you please describe the current state of the energy and job market and how investment of this variety will support job creation?

Mr. MONIZ. Thank you, Congressman Rush. It is great to see you again.

First of all, in doing five annual energy employment reports pre-COVID, a very important result is that we found that job growth in the energy sector was double the pace of job growth in the economy as a whole.

So clearly there is a high leverage here in clean energy to also try to dig ourselves out of the jobs hole that we still have from the COVID period. Unfortunately, we don't yet have the data for 2020, and I am hoping that the new administration is now going to get that project going because, frankly, let's say it fell through the cracks in the last administration, but getting a rebaselining for 2020 when we had the COVID impact will be very, very important.

And looking at the patterns of who lost jobs, where jobs were lost. For example, in energy efficiency, we know that 3 years' worth of job loss—of job gains, excuse me—were lost in that one year. So I am hoping that that exercise will happen very, very soon to collect the data from 2020.

Mr. RUSH. Thank you.

Mr. MONIZ. And, by the way, the Congress has spoken clearly in terms of appropriating funds to the DOE specifically to execute that job.

Mr. RUSH. Thank you.

I yield back.

Mr. PALLONE. Thank you, Bobby.

And I think last, but not least certainly, is Kathy Castor.

Ms. CASTOR. Thank you, Mr. Chairman. I am excited that I can bat cleanup today, and I want to thank our witnesses for the quality time that you all have spent with the committee today.

It has been heartening to hear all of our colleagues bring forth their ideas to help lift America and create jobs, and it is clear that the LIFT America package will really help us build back better and create those good-paying, family-sustaining jobs that we are going to need as we move out of COVID.

Dr. Frieden, it is really good to see you again. We thank you for your leadership. It is clear we have got to rebuild our public health workforce, infrastructure, data systems, and I appreciate your endorsement of this, of the ideas in this legislation.

But I want to focus with Secretary Moniz here on the clean energy future because more and more American families and businesses, consumers, they are demanding clean energy. They know that it is cheaper. They want the modern tools of energy efficiency to help them lower their electric bills.

In fact, there was a recent analysis by Vibrant Clean Energy that found that a clean electric grid with expanded distributed solar and storage is $88 billion less expensive than business as usual.

If we just kept doing what we are doing, didn't make any changes, if we invest in clean energy, $88 billion in benefits, and that is just one of a whole bunch of reports that have informed what is happening here in the LIFT America Act, including the big report last year out of the House Democrats, the Solving of Climate Crisis Report, and I want to thank Chairman Pallone for incorporating a lot of our recommendations into this bill.

But, Secretary Moniz, we have discussed everything today—the grid enhancing technologies, the distributed solar power, how we advance ports—but let's talk about the jobs, the opportunities for good-paying—a lot of good jobs, union jobs with fair labor standards.

This appears that we have an enormous opportunity here all across the country to create all sorts of different jobs. Tell me what really excites you when you think about our clean energy future and helping tackle climate change in the jobs piece.

Mr. MONIZ. Well, thank you, Congresswoman Castor, and thank you for your heroic effort last year on that massive report that you also led.

With regard to the jobs—well, first of all, as I have said a couple of times, we at EFI are partnering with the AFL–CIO, and one reason for doing that is that—well, first of all, I have been working with them for a long time, and at the Department of Energy we established a strong jobs program.

But also, frankly, I have said many times that if we do not address the issue of jobs and communities, we will have headwinds in making our climate progress. So it is important for that reason as well.

Secondly, with the AFL–CIO, we have written out 10 areas for a clean energy future where we think there are massive opportunities for creating good, high-paying jobs. I mentioned earlier offshore wind was one of those, carbon capture and sequestration, infrastructure. Those were our top three. So this LIFT America Act fits right in there, and labor is very, very excited about this.

Third, there are—one area, you mentioned solar, for example. Just to say that in solar what we have found is that there are about a quarter million jobs today—or I am sorry, in 2019, the last data that we have, in 2019—and an additional 100,000 jobs for those who work at solar less than half the time. Typically in the construction business, where they would spend some time, say, mounting photovoltaic panels, but less than 50 percent of the time—if you add them, 350,000.

There has also been a lot of confusion in terms of wages. The wages for those jobs are substantially above the median wage in the country. And, you know, if one compares it to something like nuclear jobs, well, of course, nuclear jobs are double the median wage because of very, very high safety standards and high training requirements, et cetera.

So these are good jobs. They pre-COVID were being created at double the rate in the economy as a whole. As we are still 10 million jobs down, this is a high leverage situation where the LIFT Act, LIFT America Act can come in to get the clean energy future and create jobs at a really good clip.

Ms. CASTOR. Thanks so much.

Mr. PALLONE. Thank you, Kathy.

Let me thank our witnesses. I am looking at the clock, they have been over here 5 hours, believe it or not, taking our questions and listening to us. So thank you for your participation and your willingness to stay here for over 5 hours. We certainly appreciate that.

And I want to remind Members that, pursuant to committee rules, they have 10 business days to submit additional questions for the record to be answered by the witnesses. So you may get written questions from us as well, in addition to the 5 hours in person. And, of course, I would ask you to get to us as promptly as well.

Before we adjourn, I do have to go through a list of items to include in the record. So I request unanimous consent to offer the following documents into the record: A letter from the Association of Metropolitan Water Agencies; a letter from the Coalition for Health Funding; a letter from the National Association of Community Health Centers; an article from the Chicago Tribune entitled "Brain-damaging lead found in tap water from most Illinois communities during the past 6 years, Tribune analysis finds;" a letter from the World Resources Institute; a letter in support of the LIFT America Next Generation 9–1–1 provisions from the International Association of Fire Chiefs, Major Cities Chiefs Association, Major County Sheriffs of America, National Sheriff's Association, National Association of State EMS Officials, International Association of Chiefs of Police, Metropolitan Fire Chiefs Association, and the Association of Public Safety Communications Officials; a letter from America's Essential Hospitals; a letter from U.S. Telecom, the Broadband Association; a letter from the Environmental Defense Fund; a letter from the American Nurses Association; a letter from the American Clinic for Laboratories Association; a letter from the National Association of State 911 Administrators and the National Emergency Numbers Association; a letter from the American Gas Association; a letter from U.S. Senators Michael Bennett, Angus King, Rob Portman, and Joe Manchin; and, finally, a letter from the GPS Innovation Alliance and the CompTIA Space Enterprise.

So without objection, those will be submitted for the record, and they will be so ordered.

[The information appears at the conclusion of the hearing.]

Mr. PALLONE. So at this time let me just thank everyone again, all of our panel, all of our Members. I thought this was a very good hearing. I was rather surprised that we were here for 5 hours. It seemed a lot shorter to me because it was so interesting.

But with that, we will thank you again, and at this time the committee is adjourned—oh, did someone have a question?

Mr. MONIZ. No. Thank you, Mr. Chairman.

Mr. PALLONE. All right. Thank you, all. Thank you so much.

Do we have something else? Morgan, yes.

Mr. GRIFFITH. Apparently we have a Member who is trying to get in, log in. I don't know if he is going to make it or not.

Mr. PALLONE. Who is that?

Mr. GRIFFITH. He is having technical difficulties. Markwayne Mullin.

Mr. PALLONE. Is he trying to get in or——

Mr. GRIFFITH. What have you got? What is he trying to do?

Mr. PALLONE. I don't want to hold up the witnesses any longer. They have been here for 5 hours.

Mr. GRIFFITH. How long has he been trying to log in?

Yes, apparently he is trying to log in, Mr. Chairman, but I can't tell you how long it will take——

Mr. PALLONE. Yes. We kept them here for 5 hours. If he wants to, he can submit a written request.

All right. Thank you, all.

At this time the committee is adjourned. Thank you.

[Whereupon, at 4:13 p.m., the committee was adjourned.]

[Material submitted for inclusion in the record follows:]

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March 22, 2021

The Honorable Frank Pallone
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

The Honorable Cathy McMorris Rodgers
Ranking Member
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

The Honorable Paul Tonko
Chairman
Subcommittee on Environment and Climate Change
U.S. House of Representatives
Washington, DC 20515

The Honorable David McKinley
Ranking Member
Subcommittee on Environment and Climate Change
U.S. House of Representatives
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Dear Chairman Pallone, Ranking Member McMorris Rodgers, Chairman Tonko, and Ranking Member McKinley:

The Association of Metropolitan Water Agencies (AMWA) appreciates the opportunity to submit comments for the record of today's hearing entitled "LIFT America: Revitalizing our Nation's Infrastructure and Economy." As an organization representing the nation's largest publicly owned drinking water systems, with a collective service population of more than 156 million Americans, we are pleased that the committee is turning its attention to reauthorizing a number of critical drinking water infrastructure assistance programs.

Three years ago, Congress succeeded in enacting the bipartisan America's Water Infrastructure Act of 2018 (P.L. 115-270), commonly known as AWIA. This landmark legislation reauthorized the Drinking Water State Revolving Fund (DWSRF) and the Water Infrastructure Finance and Innovation Act (WIFIA) programs for the first time, while also creating a handful of new water infrastructure initiatives targeting priorities like drinking water resilience and emergency preparedness. However, the AWIA authorizations are beginning to expire, meaning that now is the time for Congress to recommit to these and other essential water infrastructure assistance programs.

Despite the progress represented by AWIA, and annual appropriations that have delivered funding to many of these authorized programs over the past several years, America's water and wastewater infrastructure remains in need of additional attention. EPA's most recent Drinking Water Infrastructure Needs Survey and Assessment found that the nation's drinking water infrastructure requires more than $472 billion worth of investments over two decades just to maintain current

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levels of service. The agency's corresponding needs estimate for wastewater infrastructure identified another $271 billion in required spending, but even these estimates may be too modest. The needs surveys do not take into account costs associated with new regulations to address emerging drinking water contaminants, or dollars that drinking water and wastewater systems will be forced to spend to upgrade their infrastructure to withstand the effects of climate change and extreme weather. These challenges will only grow in the coming years, just as states and communities work to emerge from the economic fallout of the COVID-19 pandemic.

Earlier this month, we watched with interest the introduction of the LIFT America Act (H.R. 1848). As proposed, Title II of this legislation carries a number of important drinking water infrastructure program reauthorizations as well as several new funding initiatives. However, Title II also includes a number of provisions that require revision and clarification, and completely bypasses an opportunity to reauthorize and improve EPA's only program solely dedicated to helping community water systems adapt their infrastructure to withstand the effects of natural hazards associated with climate change and extreme weather.

As work on this legislation moves forward, AMWA hopes to offer assistance to produce the strongest water infrastructure proposal possible. To this end, we offer the following comments and suggestions on several sections of Title II of the legislation:

**Sec. 20001: Drinking Water SRF Funding**

The Drinking Water SRF is EPA's foundational program for promoting public health protection through drinking water quality. Through capitalization grants from EPA, states leverage DWSRF funds to issue low-cost or subsidized loans for projects that protect or improve drinking water quality and therefore avoid or address serious public health risks. As of mid-2019, the DWSRF had provided more than $41.1 billion to help communities nationwide carry out more than 15,000 projects to upgrade drinking water infrastructure, improve water supply sources, and modernize drinking water treatment. However, the three-year DWSRF reauthorization enacted in AWIA is set to expire at the conclusion of the 2021 fiscal year.

AMWA appreciates that the LIFT America Act would reauthorize the DWSRF for five years, through FY26, at a total of $25.44 billion. This comes out to an average annual authorization of just above $5 billion, a level that is more than four times the typical annual appropriation received by the DWSRF in recent years. Provided that all states are able to continue to meet their 20% match requirement, this figure could represent an aspirational funding target.

AMWA further recognizes that the legislation would make permanent the American Iron and Steel Products requirement for DWSRF projects that is currently scheduled to expire after the 2023 fiscal year. Given the apparent likelihood of Congress continuing to extend this requirement into the future, AMWA believes that making it permanent will give water systems greater certainty as to the regulatory mandates they will have to comply with when pursuing DWSRF funding in the coming years.

Section 20001 would also extend through 2026 EPA's Public Water System Supervision grants to states, as well as important programs to help schools and child care centers test their water for lead

and replace outdated drinking water fountains. AMWA supports reauthorizing each of these programs to ensure they remain on solid footing for the next several years.

**Sec. 20002: Drinking Water System Resilience Funding**

AMWA supports this five-year, $250 million reauthorization of EPA's Drinking Water Infrastructure Risk and Resilience Program under Sec. 1433(g) of SDWA. This program is intended to help community water systems address vulnerabilities identified in the system's emergency response plan, with eligible uses of funds that include obtaining equipment for detecting malevolent acts, installing perimeter security systems, tamper-proofing manhole covers and fire hydrants, improvements to computer systems and cybersecurity, and equipment necessary to support emergency water and power supplies. The program's authorization expires after the 2021 fiscal year, but it should be extended as community water systems are just beginning to complete their mandated emergency response plans that outline strategies to address identified risks. The committee should also consider expanding eligible uses of program funds to support water system participation in information-sharing networks that provide intelligence on cybersecurity threats and recommended response actions.

However, the committee must recognize that this Sec. 1433(g) Drinking Water Infrastructure Risk and Resilience Program is primarily focused on helping community water systems respond to the above-defined physical and cybersecurity threats. It was not designed to broadly assist community water systems that require aid to prepare for unique challenges posed by climate change and extreme weather. For those purposes, in 2018 Congress authorized the Drinking Water System Infrastructure Resilience and Sustainability Program within Sec. 1459A(l) of SDWA. The program promises to offer competitive grants to enhance water supply options and increase the resilience of community water systems to natural hazards such as floods, hurricanes, wildfires, or other hydrologic changes.

Congress has appropriated $7 million for the Sec. 1459A(l) Drinking Water Infrastructure Risk and Resilience Program to date, and EPA plans to begin soliciting grant applications later this spring. But the scope of the program is limited because AWIA restricted eligibility to drinking water systems serving fewer than 10,000 people, or systems serving disadvantaged communities as defined by SDWA. This effectively excludes roughly 4,300 of the nation's community water systems, serving a collective population of 250 million Americans, from any chance at competing for a share of these resilience and sustainability funds.

In other words, the vast majority of the nation's communities with a population above 10,000 people are excluded from EPA's only program dedicated to helping drinking water systems prepare their infrastructure to withstand the effects of extreme weather and climate change. Communities as varied as New York, Morgantown, Chicago, Wilmington, Baltimore, and Detroit are ineligible to even apply for funds through this program. But we need only look to Jackson, Mississippi, or Austin, Dallas, and Houston, Texas, to understand how extreme weather events can impact large drinking water systems. In each of these communities, residents were left without clean drinking water or suffered extensive service interruptions due to frozen equipment, power outages, and water main breaks associated with the severe winter storm that battered the South in February. Congress cannot, in good conscience, continue to exclude these and other large drinking water systems from

having any opportunity to compete for dedicated resilience and sustainability aid from EPA.

The authorization of the Drinking Water System Infrastructure Resilience and Sustainability Program expired after the 2020 fiscal year. AMWA supports a robust reauthorization while removing the unnecessary restrictions that prevent all community water systems nationwide from having a fair opportunity to apply for funds. Any infrastructure or climate change legislation produced by this committee that ignores this need will remain incomplete.

**Sec. 20003: PFAS Treatment Grants**

AMWA welcomes the legislation's creation of a new Sec. 1459E of SDWA that would house a grant program to help community water systems offset costs associated with implementing technologies to remove per- and polyfluoroalkyl substances, or PFAS, from drinking water. While this funding assistance could provide much needed relief to communities that may be faced with investing in expensive PFAS removal technologies, the usefulness of the program as written in the legislation appears to be severely limited. This is because the new Sec. 1459E(c) would only allow grant funding to be spent on technologies that are certified by EPA to be "effective at removing *all detectable amounts* of PFAS from drinking water" (emphasis added).

Given the thousands of long-and short-chain PFAS in the environment, and modern advancements that allow PFAS to be detected in drinking water at the part-per-trillion level, restricting funding assistance only to technologies that can remove "all detectable amounts" of the substances would exclude virtually all technologies that water utilities currently rely on to address PFAS. For example, this funding could not be used on technologies like granular activated carbon filtration that are effective at removing long-chain PFAS, but which are less successful at eliminating short-chain PFAS. Even high-pressure membranes like reverse osmosis, which EPA has declared to be "extremely effective at removing PFAS" from drinking water, are typically "90 percent effective at removing a wide range of PFAS."[1] While 90% is impressive, it is less than the "all detectable amounts" standard that the legislation would require the technology to reach before Sec. 1459E funding could be expended on it.

To ensure that the program is able to offer funding to help communities bring concentrations of PFAS to below any applicable state or federal drinking water standard, AMWA recommends that the proposed Sec. 1459E(c) language be modified to read as follows:

> "(c) LIST OF ELIGIBLE TREATMENT TECHNOLOGIES.—Not later than 150 days after the date of enactment of this section, and every 2 years thereafter, the Administrator shall publish a list of treatment technologies that the Administrator determines to be effective at reducing concentrations of PFAS in drinking water to—
>
> > "(1) in the case of a PFAS that is subject to a national primary drinking water regulation under this Act, a level that is not more than any maximum contaminant level for such PFAS established through such regulation; or

[1] https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies

> "(2) in the case of a community water system located in a state that has established a maximum contaminant level for a PFAS that is below the level referenced in paragraph (1), a level that is not more than the level established by such state.

**Sec. 20004: Lead Service Line Replacement**

AMWA notes that the legislation would create a new Lead Service Line Replacement grant program, which would be housed in a new subsection (u) of SDWA Sec. 1452. This new program would be authorized at $22.5 billion over five years, or nearly 90% of the amount of funding that the legislation would authorize for the entire Drinking Water SRF program. AMWA has a number of observations and suggestions related to how this program would operate.

First, the legislation proposed to divide funding among states based on the same formula used to distribute Drinking Water SRF funding, which in turn is based on the results of EPA's quadrennial Drinking Water Infrastructure Needs Survey and Assessment. That formula considers all of a state's reported drinking water infrastructure needs – not only lead service line replacement costs. Meanwhile, the 2018 AWIA legislation added a requirement to Sec. 1452(h) of SDWA that EPA must include in future drinking water needs surveys "an assessment of costs to replace all lead service lines" of public water systems in each state. This data would be a better guide for how to distribute funding exclusively for lead service line replacements among the various states, rather than the broader needs survey figures.

We also observe that this new Sec. 1452(u) program would operate alongside EPA's existing Reducing Lead in Drinking Water grant program, which was established as Sec. 1459B of SDWA through the Water Infrastructure Improvements for the Nation Act of 2016 (P.L. 114-322). That program was created to help communities fully replace lead service lines, and further allows federal dollars to be used to cover the cost of replacing the privately-owned portions of lead service lines that are the property of low-income homeowners. EPA issued the first $17 million worth of these grants in the fall of 2020.

AMWA supported creation of this existing Sec. 1459B program because it facilitates the full replacement of lead service lines, while allowing federal funds to be used to cover the cost of replacing privately-owned lead service lines at low-income households. In contrast, the proposed Sec. 1452(u) program would allow federal funding to be used to replace both publicly and privately owned portions of lead service lines, regardless of the income of the private owner. It is worthwhile to consider whether limited federal water infrastructure resources are best spent on subsidizing the replacement of lead service lines that are the private property of wealthy homeowners.

Most concerning to AMWA is the fact that the proposed Sec. 1452(u) could be interpreted to confer a permanent private-side lead service line replacement requirement on any community water system that receives any funding through the program, even after this federal assistance has been exhausted. This is because the proposed Sec. 1452(u)(5)(B) reads that "Any recipient of funds made available under this subsection shall offer to replace any privately owned portion of the lead service line at no cost to the private owner." Nothing in this language appears to limit the private-replacement requirement only to funds awarded to community water systems through the program.

AMWA does not believe that community water systems should be required to draw on ratepayer

revenue to finance the replacement of privately owned lead service lines, regardless of homeowner income. We therefore urge the adoption of the following alternative language for Sec. 1452(u)(5)(B):

> "(B) NO HOMEOWNER CONTRIBUTION.—None of the funds made available under this subsection may be used to replace the publicly owned portion of a lead service line if:
>
> > "(i) the publicly owned portion of such lead service line is connected to a privately owned portion of a service line that is comprised of lead; and
> >
> > "(ii) the recipient of such funds has not offered to replace the privately-owned portion of such lead service line at no cost to the private owner.

**Drinking Water Affordability**

While Title II touches on a number of important drinking water priorities, some things are left out. We have previously discussed our concerns about the absence of a reauthorization of EPA's Drinking Water System Infrastructure Resilience and Sustainability Program, but another priority not addressed in the legislation is a permanent low-income water ratepayer assistance program. Last December's COVID-19 response legislation (P.L. 116-260) created the Low-Income Household Drinking Water and Wastewater Emergency Assistance Program at the Department of Health and Human Services, and it has since received more than $1.1 billion in appropriated funds. The nation's water affordability challenge will not end at the conclusion of the COVID-19 pandemic, so we urge the committee to pursue establishment of a permanent low-income water ratepayer assistance program a core component of the federal safety net.

Thank you again for the opportunity to submit these comments for the record of today's hearing on the LIFT America Act. While we praise the committee's initiative in developing legislation to strengthen our nation's drinking water infrastructure, the proposal as introduced would benefit from a number of revisions to truly meet the range of challenges faced by our nation, its water systems, and their ratepayers. AMWA is eager to cooperatively assist in this process, and we hope to have the opportunity to work with the committee to refine the proposal to a point where we can offer our full support.

Sincerely,

Diane VanDe Hei
Chief Executive Officer

cc: Energy and Commerce Committee members

COALITION *for* HEALTH FUNDING

March 19, 2021

The Honorable Frank Pallone
Chairman
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Cathy McMorris Rodgers
Ranking Member
Committee on Energy and Commerce
2322 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Pallone and Ranking Member McMorris Rodgers:

The Coalition for Health Funding (CHF)—an alliance of 89 nonprofit organizations working to promote strong investments across the public health continuum—is pleased to submit this statement for the record and applauds the committee for convening this hearing on the "Leading Infrastructure for Tomorrow's (LIFT) America Act." Thank you for your commitment to improving the country's public health infrastructure as the COVID-19 pandemic exposed the serious consequences of its chronic underfunding. We wish to assist your effort by offering the following comments.

Over the last year, we have witnessed the effects of the inattention and underfunding of this country's public health infrastructure beginning with the challenges in establishing a reliable system of diagnostic testing; tracking and monitoring infections; having an adequate health care workforce to treat infected patients; supplying health care professionals with personal protective equipment; and more recently, distributing the COVID-19 vaccines while collecting data on inoculations. Preparedness, strong support for public health, and adequate funding are the best tools in combatting future pandemics; and therefore, we are pleased the committee is examining the public health infrastructure now to learn from the mistakes of the COVID-19 pandemic and ensure we are positioned to address future public health emergencies effectively.

The agencies within the Department of Health and Human Services (HHS) all have unique roles in addressing current and future health demands, but they are all interconnected. Congress cannot focus on one agency within HHS to the detriment of the others. The National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Health Resources and Services Administration, the Substance Abuse and Mental Health Services Administration (SAMHSA), the Indian Health Service, the Food and Drug Administration (FDA), and the Agency for Health Care Research and Quality together support the full spectrum of activities necessary to improve health. During the COVID-19 pandemic, the NIH, CDC, and FDA have all been highly visible to the public as new therapies and vaccines are developed and approved, surveillance of the virus is ongoing, and updated guidance is released; however, the other HHS agencies have also played key roles in the response and some of their roles will continue to grow. As an example, SAMHSA's work will be critical as the extent of the pandemic's mental health burden on Americans is realized.

While CHF appreciates the committee's effort to address public health infrastructure through the LIFT America Act, Congress must commit to robust and sustained funding for HHS and its agencies. In FY

http://www.publichealthfunding.org
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2021, the Labor-HHS-Education Appropriations bill received $197 billion in funding with $97 billion of those funds appropriated for HHS; of those funds, NIH received just under $43 billion and the remainder supported all other public health activities—disease prevention and response, health and safety security, workforce development, and access to primary and preventative care. Congress must make a financial commitment now to address the important and long-neglected needs of the entire public health infrastructure to place the country on a sustainable path forward. This only can be done by providing the full continuum of public health agencies with sufficient funds to maintain the infrastructure needed to respond to the next global pandemic as well as public health emergencies resulting from natural disasters and manmade ones, like the opioid epidemic. While CHF appreciates the immediate attention the Committee is taking to addressing the challenges of our ailing public health infrastructure, and we recognize that annual appropriations are not within this committee's jurisdiction, we urge you to remember robust and predictable public health funding—not just supplemental and one time funding—is required to end the current public health emergency and respond to those in the future as you continue your deliberations.

Thank you for your time and consideration; please feel free to reach out to me at emorton@dc-crd.com should you have questions or if the coalition can be of assistance.

Sincerely,

Erin Will Morton

Erin Morton
Executive Director

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NATIONAL ASSOCIATION OF Community Health Centers®

March 19, 2021

The Honorable Frank Pallone
Chairman
Energy & Commerce Committee
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Pallone,

On behalf of America's Community Health Centers and the 30 million patients they serve, I want to express my sincere appreciation for your leadership in acknowledging the role Health Centers play in the nation's health care system. With over 1,400 Community Health Centers nationwide providing care at more than 14,000 locations in every state and U.S. Territory, we have a proven track record of providing trusted, high-quality care and reducing health disparities. This has continued over the past year, as health centers have been on the frontlines of the COVID-19 pandemic.

Thanks to your continued support, the Committee's introduction of this forward-thinking legislation, the Leading Infrastructure For Tomorrow's America (LIFT) Act, will provide critical infrastructure funding for health centers. This bill will preserve, strengthen, and expand health centers. It will support our ability to protect the health of communities, meet the escalating demands for urgently needed health services, and serve millions of additional patients into the future.

NACHC fully supports the Committee's LIFT Act provisions, including, but not limited to:

- $10 billion in funding for community health center capital project grants for the construction and modernization of community health centers;
- $500 million for a program to award grants to qualified teaching health centers and behavioral health care centers to support the improvement, renovation, or modernization of infrastructure at such centers;
- $80 billion for the deployment of secure and resilient high-speed broadband to expand access nationwide; and
- $9.3 billion for broadband affordability and adoption to ensure that everyone can afford internet service and have the knowledge and tools to use the internet in ways that meet their needs.

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This funding will address the long-standing infrastructure needs of health centers that were put on hold and exacerbated by this pandemic. Such needs include affordable broadband deployment to rural and hard to reach populations, critical upgrades to IT systems, modernizing aging facilities, capital projects to open new sites, and expanding capacity to provide mental health and dental services, especially when demand for these services has recently exploded.

Federally Qualified Community Health Centers are the backbone of our country's primary health care system and have long earned strong bipartisan support, and we are extremely grateful for your continuous commitment to the Health Center model of care. As the LIFT Act moves through the Committee and eventually to the floor of the House, we welcome continued dialogue to ensure the Community Health Center Program retains the full support of your colleagues.

Chairman Pallone, thank you again for your trust and investment in our patients, programs, and communities. If you need any additional information, please contact Pauline Jamry, NACHC's Director of Federal Affairs, at pjamry@nachc.org or (703) 216-7796.

Sincerely,

Tom Van Coverden

Tom Van Coverden
President & CEO

CC: Cathy McMorris Rodgers
Ranking Member
House Energy & Commerce Committee

ENVIRONMENT NEWS

# Brain-damaging lead found in tap water from most Illinois communities during the past 6 years, Tribune analysis finds

By MICHAEL HAWTHORNE
CHICAGO TRIBUNE | MAR 19, 2021



Kyle McCradic, a laborer with J.C. Dillon Inc., gets ready to replace a lead service line with new polyethylene tubing in Galesburg on March 4, 2021. Pipes known as service lines connect homes to municipal water supplies. (Jose M. Osorio / Chicago Tribune)

1 / 12

More than 8 of every 10 Illinoisans live in a community where brain-damaging lead was found in the tap water of at least one home during the past six years, a new Chicago Tribune analysis found.

The alarming results are from a limited number of samples collected under federal regulations by the state's 1,768 water utilities. Depending on the number of people served by each utility, only a handful or a few dozen homes are occasionally monitored, but when combined the tests provide snapshots of a widespread threat to public health that for decades has been largely ignored.

Advertisement

Most exposure to lead in water can be traced to pipes known as **service lines** that connect homes to municipal water supplies. Illinois has more service lines made of the toxic metal than any other state. Chicago has more than any other city.

"Too many people still get their water from what essentially is a lead straw," said Miguel del Toral, a retired U.S. Environmental Protection Agency scientist who discovered high levels of toxic metal in water at homes in **Flint, Michigan**, and **East Chicago, Indiana**.

ADVERTISEMENT

Was lead found in tap water in your town? Search our analysis of Illinois EPA data to find out. »

Between 2015 and 2020, tap water in dozens of Illinois homes had hundreds and even thousands of parts per billion of lead — just as extreme as what researchers found during the same period in Flint, where mismanagement of the public water system exposed children to the toxic metal and drew a world spotlight to the scourge.

East Moline found one home with 3,000 ppb of lead in tap water, records show. The Rockford suburb of Loves Park detected 2,700 ppb of lead in a home. Southwest of Joliet, the water system in Coal City found 1,260 ppb of lead in one of its samples.

Utilities in the three cities were among 224 statewide where at least one home had lead levels at or above 40 ppb, a threshold the U.S. EPA once declared an "imminent and substantial threat to pregnant women and young children." Others in the Chicago area included Bartlett, Cicero, Lake Barrington, South Elgin and Wauconda.

Nearly 60% of the state's water systems found at least one home with levels greater than 5 ppb — the Food and Drug Administration's limit for bottled water.

By far the state's worst lead-in-water problems in recent years are in University Park, a south suburb on the border of Cook and Will counties.



An old lead service line is removed from a home in Galesburg. Pipes known as service lines connect homes to municipal water supplies. Galesburg is planning to replace all of its lead service lines by the end of the year. (Jose M. Osorio / Chicago Tribune)

Samples of tap water collected since 2019 in the predominantly Black community contained as much as 5,300 ppb of lead and averaged 54 ppb, according to the Tribune analysis of data obtained from the Illinois EPA through a Freedom of Information Act request.

"There is no training for a water crisis," said Mayor Joseph Roudez, who took office less than a month before the staggeringly high levels of lead began turning up across the village, including at his own home. "The experience has been horrible, and it's still horrible."

The U.S. EPA and Centers for Disease Control and Prevention stress that lead is unsafe to consume at any level. More than **400,000 deaths a year in the U.S.** are linked to the toxic metal. Even tiny concentrations can permanently damage the developing brains of children and contribute to heart disease, high blood pressure, kidney failure and other health problems later in life.

Yet federal regulations allow the vast majority of water utilities to hide the hazards from customers. Once a year, water bills include a brochure that almost always declares tap water is safe to drink.

Reality is more complicated in cities, towns and villages with lead service lines. Unless water drawn from household faucets is **properly filtered**, scientists and former government officials say, the only way to keep the lead out is by replacing toxic pipes.

After little progress during the Obama and Trump administrations, President Joe Biden is pledging to tackle the problem as part of his efforts to overhaul the nation's infrastructure and fight for environmental justice.

Earlier this month the Biden EPA **suspended regulations** adopted during the last days of the Trump administration that **effectively delayed lead service line replacements**for up to three decades and, in some cases, allowed cities to keep toxic pipes in the ground indefinitely.

"We're urging EPA to require that every service line in the country should be pulled out within the next 10 years," said Erik Olson, senior director for health and food at the nonprofit **Natural Resources Defense Council**, which in a recently filed **lawsuit**demanded a more aggressive strategy from the agency. "Until then they should be providing filters to keep people safe."

Other lawsuits and legislation filed after the 2015 Flint crisis already are prompting a long-delayed reckoning with the nation's reliance on lead during the last century to convey drinking water.

Cities including **Cincinnati**, **Denver**, the **District of Columbia** and **Newark**, New Jersey, are aggressively replacing lead service lines with safer materials. State governments in Michigan, New Jersey, New York and Wisconsin created funds during the past five years to speed up replacements, while Indiana and Pennsylvania authorized utilities to finance the work through water bills.

Illinois and Chicago lag far behind, though there are signs the state and city are taking the problem more seriously after years of denials.

The **Chicago Department of Water Management** just began accepting applications for **free service line replacements** at homes and two-flats where the owner's household income is less than 80% of the regional median ($72,800 for a family of four). The department also is **waiving permit fees** for homeowners who opt to pay for the work themselves.

Initial work will be modest compared with the scope of the dangers. City officials estimate this year they will only replace 750 of the roughly 400,000 lead service lines connecting homes to street mains, **according to slides prepared by the water department**.

Legislation introduced in Springfield would add a small fee to most water bills statewide, raising $200 million a year to **speed up service line replacements**. Based on typical water use by a family of four, the fee would range from $1.20 to $5.40 a month depending on how a community's median income compares with the statewide average. (The fee would be waived in census tracts with a median household income less than $39,532.)

"Illinois must step up and take action to replace the thousands of contaminated pipes throughout the state, particularly in Black and Brown communities that are struggling with countless other crises," said Naomi Davis, founder and chief executive of Blacks in Green, one of the groups backing the measure. "Babies, pregnant mothers, seniors — all residents have a right to clean water."

Every Chicago home and two-flat built before 1987 likely gets water from a lead pipe. The city's plumbing code required use of the toxic metal until Congress banned the practice.

Street work made the problem worse, in particular water main replacements launched under Mayor Richard M. Daley, rapidly expanded during Mayor Rahm Emanuel's eight years in office and continued through the first years of Mayor Lori Lightfoot's administration.

Studies by del Toral and others during the past decade have found that when service lines are jostled by street repairs or plumbing work, **spikes of lead can intermittently flow out of household taps** for weeks or months afterward.

"There's no way to make these pipes safe," del Toral said in a recent interview.

Chicago officials attempted to undermine the research until their own testing found spikes of lead in more than 1 in 5 homes where a water meter had recently been installed. Lightfoot ordered the water department to **stop installing new meters in 2019**, but city workers are still digging up streets to install new water mains, which they continue to hook up to existing lead service lines.

This summer the water department plans to combine service line replacements with the installation of a new water main on a single city block — a more cost-effective solution that already is standard practice in other communities.

Most of the money to pay for the city's new programs will come from low-interest federal loans. Since 2012, the water department has borrowed more than $487 million from the same pot of federal money to replace water mains. Emanuel doubled water rates to pay back the loans.



Tom Gorham, left, feeds new polyethylene tubing through the opening where the lead service line was in a home in Galesburg. (Jose M. Osorio / Chicago Tribune)

Other Illinois cities also are tapping into federal funds for service line replacements, most notably Galesburg in Knox County, where high rates of childhood lead poisoning prompted more rigorous EPA scrutiny in 2015.

Galesburg is on track to replace all of the city's lead service lines by the end of the year, said Wayne Carl, the city's works director.

"Most people in our community know we had concerns about lead in drinking water," Carl said. "Replacing the service lines became a smoother process over time."

A major reason why lead service lines remain in other cities is most water utilities aren't required to replace them under the federal Lead and Copper Rule, a 1991 regulation that underestimates the hazards and, in several ways, keeps them hidden from the public.

Researchers have found that lead levels in tap water can vary widely between homes and during different times of day, depending on water usage, the length of individual service lines and other factors that can limit the effectiveness of corrosion-inhibiting chemicals added to the water supply.

Yet all of the tests analyzed by the Tribune were collected using EPA protocols that require sampling of just the first liter of water drawn after faucets have been turned off overnight. More extensive sampling in Chicago, Flint and other cities showed the highest levels of lead often flowed out of taps after water had been running for several minutes.

Marc Edwards, a Virginia Tech researcher who led a team that flagged lead problems in Cicero, Flint and the District of Columbia, compares the unpredictable spikes to Russian roulette, the lethal game of chance.

Changes in water chemistry also can affect lead levels. High levels of the toxic metal began leaching out of service lines in Flint and household plumbing in University Park after local utilities switched water supplies and tweaked treatment methods.

Utilities are considered to be in compliance with the federal rule as long as lead levels are lower than 15 ppb in 90% of the samples collected during a particular sampling period. If 10 homes are tested and just one has exponentially higher levels of lead flowing out of the tap, the utility still meets federal requirements and isn't required to inform the public about potential risks.

Flint met the 15 ppb "action level" in regulatory sampling even as other testing found high levels of lead in tap water across the city.

Though the 15 ppb threshold often is described as a safety limit for individual homes, it actually is an arbitrary level the EPA set years ago to help determine if a utility's corrosion controls are working. The only safe level is zero.

Another drawback is the federally mandated sampling is limited.

Despite having hundreds of thousands of lead service lines, Chicago is one of several big U.S. cities that are only required to test 50 homes every three years.

Most of the Chicago homes where regulatory sampling is conducted are **owned by people who work for or retired from the water department**, the Tribune reported in 2016. None are in neighborhoods with higher than average rates of childhood lead poisoning.

As a result, Chicago hasn't violated the Lead and Copper Rule since the early 1990s. But a **2018 Tribune analysis** of free testing kits distributed throughout the city revealed that lead had been detected in more than two-thirds of the homes tested. About a third of those homes had more lead in tap water than would be allowed in bottled water.

Even people within the EPA know the agency's tap water regulations are woefully inadequate.

"Consumers do not get timely, or often any information to protect themselves from elevated levels of lead in drinking water," Robert Kaplan, the EPA's former acting regional administrator in Chicago, wrote in a **2017 memo** to the agency's top water official. "Public needs to know when water is acceptable to drink based on the level of lead, or if a water filter or bottled water should be used."

The Trump administration's overhaul would have required homeowners to be promptly informed if high levels of lead were detected during compliance sampling. But the revised regulations would have allowed lead service lines to remain underground for years or even decades.

Del Toral, the retired EPA scientist, helped draft Kaplan's **memo**. He advises the Biden administration to keep its own version of the regulations simple.

"Tell people if they have a lead service line so they're aware of the dangers and can start filtering their water," del Toral said. "Provide filters to low-income folks. And damn it, just get the pipes out."

*mhawthorne@chicagotribune.com*

WORLD
RESOURCES
INSTITUTE

10 G Street, NE Suite 800 Washington, DC 20002 USA (PH) +1 (202) 729-7600 (FAX) +1 (202) 729-7610 www.WRI.org

March 21, 2021

Dear Chairman Pallone,

I write today on behalf of the World Resources Institute (WRI) to comment on Section 34341 of H.R. 1848, the LIFT America Act, for the record of the Energy and Commerce Committee hearing scheduled for March 22, 2021.

Section 1848 of the LIFT America Act would establish a Clean School Bus Program to replace polluting diesel school buses with clean electric buses. Doing so is vitally important to protect the health of millions of school children, improve their ability to learn, reduce carbon dioxide emissions, and help catalyze the electrification of America's transportation system. To protect our children now and in the future we should commit, as a nation, to replacing the entire fleet of approximately 480,000 diesel school buses with electric buses.

WRI strongly supports the approach taken in the LIFT Act's Clean School Bus Program, however the authorized appropriations level of $130 million per year is far too low to accomplish the task at hand. Electric School buses currently cost more than $200,000 more than equivalent diesel school buses. At that price, the authorized funding in the LIFT Act would only be sufficient to replace approximately 650 school buses per year, meaning it would take more than 700 years to replace the entire fleet. The incremental cost of electric school buses could be cut dramatically if electric bus production scales up to the level needed to replace the fleet over a decade. Unfortunately, the authorization level in the LIFT Act is woefully inadequate to achieve the needed economies of scale.

As the Committee marks up H.R. 1848 we urge it to increase the authorization for the Clean School Bus Program to $2.5 billion per year, as provided in Section 423 of the Clean Future Act. Such an investment would lead to a rapid decline in the cost of electric school buses and put the nation on course to turn our yellow school buses green to provide a clean ride to all 25 million children who rely on buses to get to school.

Sincerely,

Daniel A. Lashof
U.S. Director, World Resources Institute

March 22, 2021

The Honorable Frank Pallone
U.S. House of Representatives
Chairman, Committee on Energy and Commerce
2107 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Cathy McMorris Rodgers
U.S. House of Representatives
Ranking Member, Committee on Energy and Commerce
1035 Longworth House Office Building
Washington, D.C. 20515

Dear Chairman Pallone and Ranking Member McMorris Rodgers:

The Public Safety Next Generation 9-1-1 Coalition writes to express our support for the introduction of the Next Generation 9-1-1 Act of 2021 as part of the LIFT America Act.

The Coalition, consisting of the National Sheriffs' Association, Major County Sheriffs of America, Major Cities Chiefs Association, International Association of Chiefs of Police, International Association of Fire Chiefs, Metropolitan Fire Chiefs Association, National Association of State EMS Officials, and the Association of Public-Safety Communications Officials-International all strongly support this NG 9-1-1 legislation.

Even though 9-1-1 systems are critical infrastructure in every community, they are underfunded and technologically inadequate to address the needs and expectations of the American people in the 21st Century. While 9-1-1 operations are state and local functions, the investment of federal resources in this critical infrastructure will ensure that all communities in the United States, be they rural, urban, or tribal, will have a secure, resilient, interoperable, and reliable way of receiving, processing, and responding to requests for emergency assistance.

Our organizations will work to ensure strong bipartisan support for this important and historic provision of the legislation. In this regard, we would respectfully ask that you share this letter with the members of the Committee. We look forward to working closely with you and your offices to ensure ultimate passage and help build the capacity of our nation's first responders to serve and protect all communities across America.

We appreciate your leadership on this important legislation.

Sincerely,

Members of the Public Safety Next Generation 9-1-1 Coalition:

International Association of Fire Chiefs
Major County Sheriffs of America
National Association of State EMS Officials
Metropolitan Fire Chiefs Association
Association of Public Safety Communications Officials – International
Major Cities Chiefs Association
National Sheriffs Association
International Association of Chiefs of Police




**America's Essential Hospitals**
**Statement for the Record**
**House Committee on Energy and Commerce**

**LIFT America: Revitalizing Our Nation's Infrastructure and Economy**

March 22, 2021

America's Essential Hospitals appreciates the opportunity to submit a statement for the record as the House Committee on Energy and Commerce considers legislation to revitalize the nation's infrastructure. We are grateful the committee recognizes the need to invest in and rebuild hospital infrastructure, particularly for hospitals caring for communities and populations with the greatest health and socioeconomic needs. We also commend Rep. Tom O'Halleran (D-AZ) for his leadership in identifying and advocating for additional capital investments in hospital facilities.

America's Essential Hospitals is the leading champion for hospitals and health systems dedicated to providing high-quality care to all. Our more than 300 member hospitals and health systems form the very fabric of the nation's health care safety net. They care for underrepresented people and anchor communities across the country, from the largest cities to expansive rural regions. They are sources of lifesaving care, jobs, and vital public health services that influence the social, economic, and environmental circumstances of a person's life. Essential hospitals serve communities where need is greatest and in areas that might otherwise lack health care access. They reach outside their walls to care for communities where more than 23 million people live below the federal poverty line, nearly 10 million have limited access to nutritious food, and 360,000 experience homelessness.[1] Three-quarters of essential hospitals' patients are uninsured or covered by Medicaid or Medicare.[2]

Consequently, essential hospitals operate with strained finances; their margins are one-third that of other U.S. hospitals. Under normal circumstances, essential hospitals execute their missions on limited cash reserves. In times of crisis, such as the COVID-19 public health emergency, increased expenses to care for patients and protect clinicians coupled with decreased revenue from canceled elective procedures left some essential hospitals with just days of cash on hand during the height of a global pandemic.

These hospitals invest their scarce resources back into their patients and communities, leaving little financially to support system modernization or facility refurbishment. In the best of times, essential hospitals struggle to cobble together state, local, and federal resources to maintain

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[1] Clark D, Roberson B, Ramiah K. *Essential Data: Our Hospitals, Our Patients—Results of America's Essential Hospitals 2018 Annual Member Characteristics Survey.* America's Essential Hospitals. May 2020. https://essentialdata.info. Accessed March 19, 2021.
[2] Ibid

essentialhospitals.org
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their aging infrastructure. Antiquated and deteriorating facilities exacerbate the challenges of caring for medically complex and marginalized populations, particularly during a public health emergency.

An article in *The New York Times* last spring chronicled the experience of one essential hospital in New York City at the onset of the COVID-19 pandemic. Serving a community that sees high numbers of low-income patients and patients of color, SUNY Downstate accommodates more than three times the number of patient visits than it was built to handle nearly 60 years ago.[3] During the height of the COVID-19 crisis last spring, which disproportionately harmed populations served by the hospital, clinicians cared for patients with handmade workarounds, such as "plastic tarps and duct tape" to separate patients. The article reported that a "leaky roof forced a temporary evacuation of premature babies from a neonatal intensive care unit" and that the "bunkerlike concrete building is crumbling from within."[4]

This is the story of other essential hospitals across the country. From the inner cities of the nation's largest metropolitan areas to the tribal lands in the Arizona deserts, essential hospitals provide high-quality care despite severe built and technological limitations. Their mission demands they overcome these barriers, but they cannot do it alone.

To meet their safety net role, essential hospitals require more federal support for current and future needs—from repairing crumbling facilities to building health information technology capacity to marshaling resources for the next public health emergency or cybersecurity threat. Targeting capital investments to under-resourced providers would supplement the patchwork of federal supports they rely on to achieve their safety net mission, enabling them to embark upon needed construction or modernization projects they otherwise could not finance. To that end, America's Essential Hospitals supports provisions in the LIFT America Act to authorize new resources for hospital construction and modernization. We encourage the committee to ensure adequate resources are available through its legislation and consider further targeting those resources to providers serving disadvantaged populations.

Physical infrastructure investments should be coupled with digital investment, enabling safety net providers to leverage telehealth capabilities to reach beyond their walls and into the communities where their patients live and work. We appreciate that the LIFT America Act would equitably enhance access to broadband and invest in health information technology as core components of the public health infrastructure. We encourage the committee to build on this by including resources to expand access to telehealth specifically. Telehealth is a safe and effective option for patients and allows our hospitals to operate more efficiently and stretch their scarce resources further. But not all providers can maximize this important tool due to financial constraints. Targeting technological and telehealth infrastructure investments to these providers would help them better reach vulnerable populations who might otherwise face barriers to care.

It is important Congress use this opportunity to strengthen and support emergency preparedness. Lawmakers should prioritize the health care safety net before, during, and after a public health emergency. The populations and communities at risk during a crisis can be identified in advance, and investments should be directed accordingly. The LIFT America Act

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[3] Schwirtz M. One Rich N.Y. Hospital Got Warren Buffett's Help. This One Got Duct Tape. *The New York Times*. April 26, 2020. https://www.nytimes.com/2020/04/26/nyregion/coronavirus-new-york-university-hospital.html. Accessed March 19, 2021.
[4] Ibid

would prioritize resource infrastructure funding to hospitals investing in emergency and cybersecurity preparedness. We urge Congress to ensure safety net providers are adequately prepared to respond to future public health crises. Investing in infrastructure improvements now will help mitigate disparities in the short term by increasing capacity and resources while simultaneously ensuring preparedness in the event of a future public health crisis.

The association thanks Congress for its commitment to addressing infrastructure needs. We look forward to working with the Committee on Energy and Commerce, as well as other committees in the House of Representatives, to improve the nation's health care infrastructure and ensure the safety net is equipped and prepared for future public health challenges and crises.




JONATHAN SPALTER
President and Chief Executive Officer

March 22, 2021

The Honorable Frank Pallone, Jr.
Chairman
Committee on Energy and Commerce
2107 Rayburn House Office Building
Washington, DC 20515

The Honorable Cathy McMorris Rodgers
Ranking Member
Committee on Energy and Commerce
1035 Longworth House Office Building
Washington, DC 20515

Dear Chairman Pallone and Ranking Member McMorris Rodgers:

Thank you for holding today's hearing on revitalizing our nation's infrastructure and economy.

USTelecom proudly represents broadband providers, suppliers and technology innovators in every corner of the country. Our broadband networks have been resilient and fully capable of carrying the surge in high bandwidth traffic during the last year, but this means little to the millions who lack broadband access or simply cannot afford service in the first place. We all must recognize the digital divide is not solely an issue of access, but of affordability and adoption as well.

It is thus an important and timely step that $9.3 billion for broadband affordability and adoption is included in the LIFT America Act, and your leadership in achieving this is appreciated. But there is still much work ahead to achieve our shared goal of universal and affordable connectivity for all in America. Even as the cost of broadband in the United States is decreasing—too many still remain without broadband connectivity. That is why we applaud the initial emergency broadband program that Congress has passed—and urge you to pursue even bolder and bigger steps to provide support on a long-term basis after the pandemic passes.

It is critical to engage across all sectors—public, private, and non-profit—to ensure support to help all unserved communities get and stay connected. We can start with the estimated 17 million school-age children who have no broadband connection at home.

USTelecom and our members are staunch advocates for the critical direct spending on broadband infrastructure included in the LIFT America Act, as well as the important federal investments in broadband over the past few months that can help achieve our shared goal of universal connectivity. This will only happen if funding is spent with precision and coordination among all federal and state government agencies.

As Congress considers additional resources in high cost and otherwise unserved parts of our country, we respectfully believe more can be done to avoid waste and prevent overbuilding existing support

programs so that every new dollar reaches truly unserved communities as efficiently and quickly as possible.

Two areas where we encourage the Committee to continue to focus include:

**Updated and Data Driven, 21st Century Broadband Maps**
Thanks to the Broadband DATA Act, updating and modernizing our nation's broadband coverage maps is currently underway and incremental results should be available from the FCC later this year. We know that many of the Americans that lack broadband do not show up on any map today, simply because their neighbor has service available. This updated map must guide the distribution of all of the historic and essential funding Congress has approved to reach the unconnected—including those carried out by the states. Duplicative mapping efforts are counterproductive and costly.

**Stringent Interagency Coordination**
The Department of Agriculture, the Department of Commerce and the Federal Communications Commission, along with various stimulus grants over the years, have prioritized serving the highest number of eligible locations possible through their broadband programs. While this goal seems like a good one, the reality is it often results in funding the same locations over and over again while leaving remaining unconnected locations without connectivity.

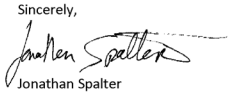
To "avoid" overbuilding, each program continually changes the definition of unserved, based on an ever increasing minimum speed requirement. By doing so, new programs can essentially overbuild the same locations covered by previous programs by simply upgrading speeds to the locations that are less expensive and easier to serve. The fast connections get faster while the unconnected stay unconnected.

Truly closing the digital divide means first connecting the unconnected. To accomplish this goal, we must ensure that all government broadband programs, both federal and state, are using the same sets of data and minimum speed requirements when identifying unconnected locations. Explicit and binding interagency coordination is critical in this regard, as is ensuring the efficient allocation of funds by avoiding funding duplication.

We hope the Committee will focus on what we know is the most efficient way to allocate our finite resources: public-private partnerships. Working together, government and industry innovators have shown how these partnerships are the most proven and efficient way to competitively distribute government funds to connect American communities.

Broadband plays an essential role in any plan to lift our families, neighbors, and enterprises up and move our nation forward. USTelecom members are committed to continuing to work side-by-side with you, and with partners throughout government to build and invest in these networks, and bring high-speed broadband deeper into all corners of America. We look forward to working with you and the Committee to ensure all in America are connected to the power and potential we know our world-class communications infrastructure delivers.

Sincerely,



Jonathan Spalter

EDF
ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

March 21, 2021

Chairman Frank Pallone
Committee on Energy and Commerce
U.S. House of Representatives
Washington, D.C. 20515

Ranking Member Cathy McMorris Rodgers
Committee on Energy and Commerce
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Pallone and Ranking Member Rodgers,

We commend the sponsors of the LIFT America Act for including vital funding for full lead service line replacement in the legislation.

In an effort to ensure that the language clearly provides for full lead service line replacement as intended, we suggest several small technical changes to the language for your consideration. The suggested changes are:

- Deleting "to a household, or to a property under the jurisdiction of a local educational agency" in lines 9 to 11 on page 212. Lead service lines deliver drinking water to many other types of users including child care centers and restaurants.
- Replacing "Homeowner" in the title of paragraph (B) in line 13 on page 212 with "Private owner" to be consistent with the text and avoid confusion. The term "private owner" would clarify protections for the tenants of the many small landlords. The burden of lead is already the greatest for these tenants primarily due to lead-based paint.

Thank you for your consideration of the proposed language changes. You can contact me at tneltner@edf.org.

Sincerely,

Tom Neltner

Tom Neltner
Chemicals Policy Director

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**Statement for the Record**
**American Nurses Association**
**LIFT America: Revitalizing our Nation's Infrastructure and Economy**
**House Energy and Commerce Committee**
**March 22, 2021**

The American Nurses Association (ANA), representing the interests of the nation's 4.2 million registered nurses, commends the House Energy and Commerce Committee for convening this hearing on "LIFT America: Revitalizing our Nation's Infrastructure and Economy," and appreciates the opportunity to submit this statement for the record.

ANA is committed to advancing the nursing profession by fostering high standards of nursing practice, promoting a safe and ethical work environment, bolstering the health and wellness of nurses, and advocating on health care issues that affect nurses and the public. ANA is at the forefront of improving quality of health for all.

**Public Health Infrastructure and Workforce**
The nation's public health infrastructure and workforce have been underfunded for decades, and we have witnessed the highlighted impacts of this chronic underfunding throughout the COVID-19 public health emergency. Federal funds for state, local, and tribal public health preparedness were cut from $940 million in 2002 to $675 million in 2019. During the same time period, hospital emergency preparedness was cut by nearly fifty percent, from $515 million in 2004 to $265 million in 2019[1]. This has resulted in a loss of 55,000 public health workers since 2008. The current COVID-19 public health emergency has underscored that our nation must be better equipped with preparedness and response personnel, measures and processes. This is not only important during the time of crisis, but generally to address the overall health and well-being of our population.

The public health nursing workforce touches every aspect of health care and community well-being. Unfortunately, we can only imagine how different the coronavirus response would have been, had greater public health infrastructure investment afforded availability of sufficient numbers of nurses and other public health personnel in areas of the greatest need. Nurses could have played an enhanced role in encouraging and administering COVID-19 tests in high-risk populations, conducting contact tracing at an effective pace, educating the public about vaccine safety and all facets of COVID-19 prevention and mitigation, informing school opening protocols, and collecting data for feedback to pandemic response efforts.

**Nursing Faculty Shortage**
While more funding for physical infrastructure and hiring health care workers is necessary and will be a vast improvement, Congress must also act to ensure there are sufficient numbers of nurse educators to provide instruction and clinical training for future nurses and other health care professionals to provide the care patients need. With the devastating nursing shortage of the 1990's still fresh in our memories, ANA remains concerned about future shortages due to a rapidly retiring workforce[2], burnout[3], and mental distress from COVID-19[4]. As such, ANA urges Congress to recognize that without ample capacity to

[1] https://www.tfah.org/wp-content/uploads/2020/04/TFAH2020PublicHealthFunding.pdf
[2] https://www.nursingoutlook.org/article/S0029-6554(16)30314-1/fulltext
[3] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2775923
[4] https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/mental-health-and-wellness-survey-2/

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educate nursing students and provide hands-on experience, the goal of increasing the health care workforce will not be achievable.

The numbers speak for themselves: nursing schools in the United States were forced to turn away more than 80,000 qualified applicants for baccalaureate and graduate nursing programs in 2019 alone. Most nursing schools responding to a survey from the American Association of Colleges of Nursing (AACN) pointed to faculty shortages as the top reason for not accepting additional qualified nursing school applicants to their programs. Another report by AACN found more than 1,600 faculty vacancies, not including new faculty positions[5].

Faculty salary and student loan debt are additional barriers to attracting nurses to academia. When students graduate nursing programs are burdened by excessive student loans, they generally seek positions with higher salaries. According to AACN, 69 percent of graduate nursing students surveyed in 2016 took out federal student loans, with the median amount being $40,000 to $54,999. The most jarring finding was that more than half of students from ethnic minorities had to borrow more than $55,000 – higher than the total average for the entire survey[6]. With the American Association of Nurse Practitioners finding the average salary of a nurse practitioner to be $110,000[7] and AACN reporting that the average salary for a master's-level assistant professor in nursing schools to be less than $80,000, it is no wonder loan burdened students are less able to join academia and educate future generations of nurses.

ANA commends the House Energy and Commerce Committee for looking to the future and working to rebuild our public health infrastructure and workforce, where public health nurses serve as the first line of prevention in mitigating threats to the health of the U.S. population. ANA encourages the Committee to invest in the nation's public health infrastructure and provide resources to educate and train the next generation of public health nurses and workers.

Thank you for giving nurses the opportunity to provide input on the importance of rebuilding our nation's public health infrastructure. ANA stands ready to work with the Committee to find and implement sustainable solutions regarding this important issue. If you have any questions, please contact Ingrida Lusis, Vice President of Policy and Government Affairs, at (301) 628-5081 or Ingrid.Lusis@ana.org.

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[5] https://www.aacnnursing.org/News-Information/Fact-Sheets/Nursing-Faculty-Shortage
[6] https://www.aacnnursing.org/Portals/42/Policy/PDF/Debt_Report.pdf
[7] https://www.aanp.org/about/all-about-nps/np-fact-sheet

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ACLA
AMERICAN CLINICAL LABORATORY ASSOCIATION

**Statement for the Record**
**American Clinical Laboratory Association**
**Hearing before the House Energy and Commerce Committee**
**"LIFT America: Revitalizing our Nation's Infrastructure and Economy"**
**March 22, 2021**

The American Clinical Laboratory Association (ACLA) is pleased to submit this statement for the record and appreciates the efforts of Chairman Pallone and Ranking Member Rodgers in convening this hearing on the *Leading Infrastructure For Tomorrow's America Act (LIFT) Act*. Thank you for your leadership throughout the COVID-19 pandemic and your recognition of the importance of investment in our nation's health care infrastructure to prepare for and prevent future public health emergencies.

ACLA is the national trade association representing leading laboratories that deliver essential diagnostic health information to patients and providers. ACLA members are at the forefront of driving diagnostic innovation to meet the country's evolving health care needs and provide vital clinical laboratory tests that help identify and prevent infectious, acute, and chronic disease. ACLA members also have been a vital component of the response to the COVID-19 pandemic, having performed more than 110 million COVID-19 diagnostic tests to date. ACLA works to advance the next generation of health care delivery through policies that expand access to lifesaving testing services.

ACLA applauds the LIFT America Act's significant investment in our nation's public health infrastructure, including clinical laboratories. Since the early days of the COVID-19 pandemic, ACLA member laboratories have been working around the clock to meet patients' evolving health needs while adapting platforms and workflows, navigating supply constraints, and working creatively and collaboratively with federal, state and local governments. Commercial laboratories have played an essential role in rapidly expanding access to COVID-19 testing and providing surge capacity testing for the CDC and public health labs in the COVID-19 response and past public health emergencies. We strongly support Section 40004 of LIFT America Act, which establishes a pilot program to provide much-needed grants to clinical laboratories for improvement, renovation, and modernization efforts to expand and enhance COVID-19 testing. These funds will support sustained laboratory capacity in the COVID-19 response, as well as preparedness for future emergencies so that testing can be ramped up as quickly as possible in response to emerging threats.

ACLA strongly supports the establishment of a national public health reporting system that enables uniform reporting across the country and improved access to data to inform response efforts and identify health disparities. We are encouraged by increased resources in Sections 40001 and 40002 of the LIFT America Act to support modernization of public health IT infrastructure. The COVID-19 pandemic has highlighted

troubling gaps in our nation's public health data systems that have created barriers to accessing critical data on race and ethnicity needed to address health disparities. The current patchwork system of public health data reporting requirements and inconsistent public health authority data system capabilities lack interoperability and require laboratories to report varying data sets of patient information and results to multiple systems on the federal, state, and local levels. These duplicative data feeds place additional cost and burden on clinical laboratories that often lack direct access to the demographic data being requested at the same time that laboratories already are expending tremendous resources to sustain testing capacity. We urge CDC to utilize resources provided by the LIFT America Act to implement a centralized platform for laboratory results, work with states to standardize reporting requirements, and direct demographic data reporting obligations away from laboratories and toward the ordering providers who have direct access to such information.

While the LIFT America Act marks an important step in addressing public health infrastructure needs, additional reforms will be necessary to support a robust laboratory infrastructure and ensure our nation is better prepared for future public health emergencies. We look forward to continuing to work with the Energy & Commerce Committee to address other key issues impacting clinical laboratories, including the threat of substantial cuts to Medicare reimbursement for laboratory tests under the Protecting Access to Medicare Act (PAMA) set to take effect in 2022. ACLA is also committed to working with the Energy & Commerce Committee on comprehensive diagnostics oversight reform to encourage innovation and support continued access to accurate and reliable laboratory developed tests (LDTs), which have been a critical component of the COVID-19 response.

Thank you for your consideration of our comments. ACLA stands ready to serve as a resource to you in the COVID-19 pandemic and beyond. If you have any questions, please contact Tom Sparkman at tsparkman@acla.com.

March 19, 2021

U.S. House of Representatives
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Pallone, Chairman Doyle, Ranking Member McMorris Rodgers, and Ranking Member Latta:

The National Association of State 911 Administrators (NASNA) and the National Emergency Number Association (NENA) appreciate the opportunity to provide the Committee with their perspectives on "*Leading Infrastructure for Tomorrow's America Act of 2021*" (*LIFT America Act*; H.R. 1848), which includes $15 billion of Federal funds to accelerate the implementation of Next Generation 9-1-1 (NG911) across the country.

As the only public safety organizations exclusively dedicated to 911, NASNA and NENA's expertise in emergency calling standards, technology, procurement, and deployment of 911 and NG911 systems is absolutely unparalleled, worldwide. There is simply no comparable group of NG911 experts in existence.

NASNA's members are directly responsible for nearly every NG911 deployment in the United States. Their expertise in NG911 grants comes from two sources: First, they represent the vast majority of federal grant recipients of the $115M provided in the 2012 Middle Class Tax Relief and Job Creation Act; even further, many NASNA members have administered state-level NG911 grant programs *of their own* in recent years.

NENA working group volunteers — who hail from both public safety and industry — devote over 30,000 hours every year to developing and maintaining NENA's roughly two hundred technical and operational standards for 911 and NG911. NENA volunteers literally invented Next Generation 9-1-1, and many of them still participate in its continued development. Among NENA standards is the NENA *i3 Standard for Next Generation 9-1-1*, known simply as "i3" — the only complete NG911 specification in existence. As of this letter's writing, just over half the United States' population is either being served by or is under contract to be served by an NG911 system built to the NENA i3 standard.

NASNA and NENA support the accelerated deployment of NG911 — our organizations have called for a nationwide, coordinated transition to NG911 since the early days of the concept itself. This advanced communications capability provided by NG911 is critical to the safety and security of our communities. It will enable the nation's 911 systems to keep pace with advancing technology and provide improved communications resiliency during emergencies. While many states have invested in NG911 technology, funding remains the biggest obstacle to full nationwide deployment. We strongly support Congressional efforts to make the investments necessary to ensure an advanced and secure emergency communications infrastructure.

The *LIFT America Act* recognizes that the governance and control of 911 systems, including NG911, should remain at the State, regional, and local level. At the same time, it establishes a nationwide framework to facilitate cooperation among Federal, State, and local officials and to promote the interoperability and reliability of NG911 systems. NASNA and NENA support these important objectives but believe they would be undermined

by some of the Act's provisions. Congress must act to rectify the following provisions or risk compromising NG911 for many years ahead.

**Commonly Accepted Standards**

NG911 interoperability is critically important, and the path to interoperability begins with adherence to commonly accepted standards. In NG911, the single most commonly referred to standard is NENA i3, bar none. All NG911 systems currently deployed in the U.S. are based on the NENA i3 (i3) standard, and in many ways i3 is synonymous with NG911. Of course, like all communications technologies, standards are always evolving. The current version of the standard is NENA i3 Revision 3; this version of the standard is expected to be accredited by the American National Standards Institute (ANSI) later this year.

i3 is not the only standard necessary for NG911 — indeed, specifying the interfaces and functional elements of an entire NG911 network requires much more than a single standard. Numerous standards addressing PSAP equipment, data structures for Geographic Information Systems (GIS), or standards for 911 data management, are referenced by i3. To track these standards, the 911 Implementation Coordination Office (ICO) publishes an annual compendium of NG911 standards, and that report lists more than twenty-five organizations in addition to NENA that develop standards relevant to NG911.[1]

Unfortunately, the introduced legislation fails to fully account for this robust standards ecosystem. In pursuit of so-called "seamless" interoperability, the *LIFT America Act* conditions NG911 grant eligibility on applicants' use of the defined term "commonly accepted standards." The definition of "commonly accepted standards" is thus crucial, as improperly limiting grant eligibility (by inadvertently prohibiting use of certain standards, for example) could stifle future technological innovation and even undermine interoperability objectives. It is for this reason that our organizations — the peerless experts in Next Generation 9-1-1 standards, procurement, and deployment — find reason for alarm in the current definition. The definition of "commonly accepted standards" found in the *LIFT America Act* could inadvertently impede the implementation of $15B worth of interoperable NG911 systems.

The Act defines "commonly accepted standards" as:

> COMMONLY ACCEPTED STANDARDS. —The term 'commonly accepted standards' means the technical standards followed by the communications industry for network, device, and Internet Protocol connectivity that enable interoperability, including but not limited to—
>
> ''(A) standards developed by the Third Generation Partnership Project (3GPP), the Institute of Electrical and Electronics Engineers (IEEE), the Alliance for Telecommunications Industry Solutions (ATIS), the Internet Engineering Taskforce (IETF), and the International Telecommunications Union (ITU); and
>
> ''(B) standards approved by the American National Standards Institute (ANSI) that meet the definition of interoperable within this section.

This definition appropriately recognizes that there are a variety of standards relevant to an NG911 implementation. Unfortunately, *LIFT America* draws distinctions between these various organizations haphazardly, and in doing so risks excluding key standards from grant eligibility. Standards developed by five named organizations, i.e., 3GPP, IEEE, ATIS, IETF, and ITU, are automatically deemed acceptable for the proposed NG911 grant program, while standards developed by any other organization (including NENA) must be

[1] https://www.911.gov/pdf/National_911_Program_NG911_Standards_Identification_Analysis_2018.pdf

approved by ANSI and meet the definition of interoperable in the title. The result of these distinctions borders on absurd.

For instance, standards developed by the Open Geospatial Consortium (OGC®), which include numerous foundational OpenGIS standards, are neither ANSI-accredited nor a member of the five named organizations in the proposed legislation. The potential for improper exclusion extends to numerous other organizations found in the ICO's compendium, including

- The Federal Geographic Data Committee (FGDC)
- The International Academies of Emergency Dispatch (IAED)
- The International Organization of Standardization (ISO)
- The European Telecommunications Standards Institute (ETSI) — which, coincidentally, is home of the NG112 standard, sister specification to NENA's i3 NG911 standard.

This capricious treatment of standards risks impeding the development of NG911 and undermining interoperability of NG911 systems across the country.

As already noted, the NENA i3 Revision 3 standard is currently under review by ANSI but has not yet been formally approved. Finalization of NG911 grant guidelines prior to ANSI approval of i3 or other NENA standards could disqualify NG911 systems based on the NENA i3 Revision 3 standard; the mere chance of this disqualification would have a chilling effect on all NG911 grant applications.

Further, the Act's restrictive definition could impede NG911 implementation irrespective of when the NENA i3 Version 3 standard is approved. Technology standards are constantly evolving, just as the technologies on which they are based are evolving. There will undoubtedly be a Version 4 of NENA i3, as there will undoubtedly be other future standards relevant to NG911 that are not currently envisioned or fully developed. The statutory provisions of the *LIFT America Act* should not attempt to judge which standards or technologies are most relevant to NG911 any moreso than it should prescribe the use of a specific standard.

NASNA and NENA understand the importance of standards accreditation. If Congress wishes to implement a requirement for accreditation of a relevant standard, that requirement should be forward-looking, and avoid the exclusion of standards that are *already* commonly accepted simply by nature of their widespread implementation. NASNA and NENA believe that statutory definitions should not unnecessarily restrict innovation but should be sufficiently flexible to support the ever-evolving state of technology and relevant standards. With that in mind, we urge Congress to replace the Act's current definition of "commonly accepted standards" with the following definition:

> COMMONLY ACCEPTED STANDARDS. —The term 'commonly accepted standards' means standards followed by the communications industry that enable interoperability, are consensus-based, and are developed by recognized standards development organizations.

Should Congress fail to make these crucial changes to eligible standards, and should the grant rulemaking process fail to account for this oversight, states faced with the choice between NENA standards-compliant procurements and federal dollars may simply decline the opportunity to use these funds.

**Ensuring Interoperability**

NASNA and NENA believe that standards compliance will provide a high degree of assurance that NG911 interoperability objectives will be achieved. However, we support an additional explicit requirement in the

legislation that NG911 systems be interoperable and that grant applicants take steps to demonstrate in their state plans how they will achieve interoperability.

Unfortunately, the definition of "interoperable" in the Act does not provide sufficient clarity as to how the Act's interoperability requirement should be satisfied. The definition makes no mention of NG911 but speaks generally to the process of receiving and processing 911 calls "regardless of jurisdiction, equipment, device, software, service provider, or other relevant factors." We agree that this is the fundamental meaning of the term "interoperable." However, the definition requires this level of functionality "without the need for proprietary interfaces." This is an appropriate expectation if the definition is explicitly referencing interoperability of NG911 systems. NG911 uses "standardized" interfaces which are necessarily not "proprietary," so the imposition of this requirement on NG911 is reasonable and appropriate. However, it is unclear as to whether this interoperability requirement applies to NG911 alone or whether it also applies to any legacy 911 component that remains in use and connects to the NG911 system. Some of these legacy components (e.g., call boxes) do not have standardized interfaces. Consequently, interoperability requires that non-standardized interfaces (i.e., proprietary interfaces) be used. If proprietary interfaces are prohibited, then interoperability between NG911 systems and legacy 911 systems cannot be assured.

NASNA and NENA urge Congress to either make clear in the legislative language that the definition of "interoperable" in the Act only applies to NG911 or, alternatively, to modify the definition of "interoperable" in a way that ensures interoperability between NG911 systems and legacy 911 systems, as noted below.

> INTEROPERABLE. —The term 'Interoperable' or 'interoperability' means the capability of emergency communications centers to receive 9–1–1 requests for emergency assistance and related data such as location information and callback numbers from the public, then process and share the 9–1–1 requests for emergency assistance and related data with other emergency communications centers and emergency response providers, regardless of jurisdiction, equipment, device, software, service provider, or other relevant factors, and without the need for proprietary interfaces, except for those which are required for the continued operation of legacy systems already in use.

**The importance of interoperability between NG911 and legacy 911 systems during the NG911 transition cannot be overstated.** Many states will continue to have legacy components in use as they transition towards NG911, and states will transition to NG911 on different schedules and in different ways. The impact of these disparate NG911 deployment timelines on interoperability was described in detail in the March 2020 report of the FCC's Communications Security Reliability and Interoperability Council (CSRIC).[2] As the report concludes, interoperability challenges experienced today are largely attributed to the fact that the nation's 911 systems are in different stages of NG911 deployment. Some states have deployed a statewide NG911 system, while others have only deployed certain NG911 components, and still others have deployed nothing at all. Imposing restrictive requirements on how NG911 and legacy components interconnect will only make those interoperability issues more challenging.

**Reliability**

[2] CSRIC VII Report on the Current State of Interoperability in the Nation's 911 Systems, https://www.fcc.gov/file/18394/download

Reliability of 911 is of course very important, and enhanced reliability is one of the promises of NG911. NASNA and NENA have worked with the Federal Communications Commission (FCC) to ensure that service providers take reasonable measures to ensure the reliable operation of 911 and NG911 services including by eliminating single points of failure for critical system facilities. The FCC's rules identify certain best practices designed to ensure reliability but also provide a fair degree of flexibility for service providers to employ alternative measures that provide comparable reliability.

NASNA and NENA believe the reliability requirements imposed on NG911 grant recipients should be consistent with the FCC's rules, as State 911 authorities will necessarily look to NG911 service providers to comply with any grant obligations. We recommend changing the definition of "reliability" to the following:

> RELIABILITY. —The term 'reliability' or 'reliable' means the employment of reasonable measures to ensure the ongoing operation of Next Generation 9-1-1 through the elimination of single points of failure consistent with 911 reliability rules established by the Federal Communications Commission.

**Cybersecurity**

While IP-based NG911 technologies will vastly improve emergency response, the increased use of IP-based communications platforms increases the risk of cyberattacks. Effective cybersecurity is critical. States are already making considerable efforts to implement effective cybersecurity protections, and the *LIFT America* Act should provide the additional resources and national framework to help the States in their efforts. Unfortunately, the Act falls short in this area.

First, while the Act generally authorizes the use of NG911 grant funds for "implementation of NG911," it does not explicitly authorize cybersecurity expenses. NASNA and NENA believe that such expenditures should be expressly permitted. Notably, some states have already implemented an NG911 system but may have plans to establish an emergency communications cybersecurity center (EC3) to provide intrusion detection and protection services for PSAPs in their states. The implementation of State-based EC3s was recommended by the FCC's Task Force on Optimal PSAP Architecture (TFOPA) as an efficient and effective framework for addressing cyber-based threats; this concept was also endorsed by CSRIC. Use of grant funds to deploy and operate EC3s should be permitted even if the NG911 system has already been deployed. NASNA and NENA urge Congress to amend the Act to explicitly identify cybersecurity as an eligible expense.

Second, the Act should require NG911 grant applicants to certify annually that they are employing effective cybersecurity resources to protect NG911 systems and services from cyber-based attacks. While the Act requires applicants to address cybersecurity resources in their State plans, we believe that annual certification from the grant recipient that effective measures are being employed will provide additional assurance that NG911 systems will be protected.

Finally, NASNA and NENA oppose the establishment of a Federally managed security operations center (SOC) to manage cybersecurity on behalf of the nation's PSAPs. While the security of our nation's 911 systems is vital, the solution outlined in the Act would undermine State and local control of 911 systems, inject significant and complex privacy, technical and legal challenges into the NG911 implementation and operations process, and impose additional costs and administrative burdens on the National 911 Program — all without a clear roadmap for success. As already noted, TFOPA and CSRIC have recommended the establishment of State-based or regional EC3s, and some states are already deploying them. No federal authority or expert multistakeholder group has ever called for a national SOC. As made clear above, NG911 cybersecurity is an absolute priority for

NENA and NASNA, but as representatives of those actually deploying NG911 systems, we ask that federal dollars be spent on effective, fully baked cybersecurity measures, not nebulous additional federal programs with unclear parameters.

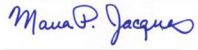
**Grant Administration**

Lastly, NASNA and NENA do not believe an NG911 Advisory Board is necessary. The ICO has implemented Federal 911 grant programs previously, and none of these programs utilized an advisory board to assist the Office in developing grant guidelines or in the award of individual grants. We don't see a compelling need to establish an advisory board here. However, if Congress should decide to include an advisory board in this legislation, we believe it is imperative that it meet certain criteria:

- the board should be comprised of individuals experienced in NG911;
- the board should not add unnecessary bureaucracy, cost, or administrative burden to the grant process;
- the board's role should be limited to providing advice on grant guidelines; and
- the board's actions should be undertaken with full transparency (e.g., no exemption from Federal Advisory Committee Act).

Thank you again for the opportunity to provide the Committee with NASNA's and NENA's perspectives on the importance of providing critical funding for Next Generation 9-1-1. Our organizations are committed not only to passage of this essential measure, but in the creation of a successful grant program that allows public safety to save countless lives while also being an effective steward of federal dollars.

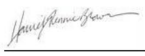
Respectfully,



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March 19, 2021

The Honorable Frank Pallone
Chairman
House Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Cathy McMorris Rodgers
Ranking Member
House Committee on Energy and Commerce
2322 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Pallone and Ranking Member Rodgers,

The American Gas Association (AGA) appreciates the House Energy and Commerce Committee's continued work in addressing the United States' long term economic growth and energy security through modernizing our country's infrastructure. AGA, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. More than 179 million Americans in homes and businesses in all fifty states utilize natural gas served by an infrastructure base that is unrivaled in the world.

The scale, affordability, reliability, and resilience of the U.S. natural gas system is the envy of the world and is a strategic asset for both achieving ambitious greenhouse gas emissions reduction goals and for geopolitical strength. Natural gas has led the reduction in United States greenhouse gas emissions. Moreover, the natural gas delivery system is flexible, reliable, versatile, and enables increased renewable energy integration. The use of natural gas, in combination with renewable energy and efficiency, has contributed to U.S. energy-related carbon dioxide emissions declining to the lowest levels in three decades. Furthermore, methane emissions from natural gas utility distribution systems have declined 73 percent since 1990, even as natural gas utility companies added more than 760,000 miles of pipeline.

As companies continue to modernize our natural gas infrastructure and connect homes and businesses to the system, new opportunities arise to achieve low-cost greenhouse gas emissions reductions by leveraging new and existing natural gas infrastructure, advanced technologies, and the nation's abundant natural gas resources. Additionally, natural gas infrastructure can be used for renewable energy storage and the delivery of renewable gases derived from biogenic sources and zero-carbon electricity. The gas system's ability to integrate high-value sources of energy

**George Lowe** *Vice President, Governmental Affairs and Public Policy*
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like renewable natural gas and hydrogen is a critical component of our nation's ability to reach ambitious greenhouse gas reductions goals.

As your Committee considers H.R. 1848, the "Leading Infrastructure for Tomorrow's America Act," during the legislative hearing entitled, "LIFT America: Revitalizing our Nation's Infrastructure and Economy" on Monday, March 22, 2021, we ask that you consider the work AGA and our members have down to reduce greenhouse gas emissions through smart innovation, new and modernized infrastructure, and advanced technologies that maintain reliable, resilient, and affordable energy service choices for consumers. AGA also asks that the following studies and reports that illustrate these important facts be submitted to the Committee's hearing record:

1. Implications of Policy-Driven Residential Electrification;
2. Electrifying the Columbus, Ohio Metro Area's Building Stock- Economic and Power Market Impacts;
3. Greenhouse Gas Emission Reduction Pathways;
4. Building a Resilient Energy Future: How the Gas System Contributes to US Energy System Resilience; and
5. Opportunities for Reducing Greenhouse Gas Emissions Through Emerging Natural Gas Direct-Use Technologies.

Thank you for the opportunity to submit for the record this important material. AGA looks forward to our continued work with your Committee on how natural gas utilities and our nation's pipeline infrastructure plays, and will continue to play, an integral role in reducing greenhouse gas emissions while providing an affordable, reliable, and resilient energy source to homes and businesses throughout the country.

Sincerely,

George Lowe
Vice President
Governmental Affairs and Public Policy
American Gas Association

United States Senate
WASHINGTON, DC 20510-3203

March 4, 2021

The Honorable Tom Vilsack
Secretary
United States Department of Agriculture
1400 Independence Avenue, SW
Washington, DC 20250

The Honorable Gina Raimondo
Secretary
United States Department of Commerce
1401 Constitution Ave, NW
Washington, DC 20230

The Honorable Jessica Rosenworcel
Acting Chairwoman
Federal Communications Commission
45 L Street, NE
Washington, DC 20554

The Honorable Brian Deese
Director
National Economic Council
1650 Pennsylvania Ave, NW
Washington, DC 20500

Dear Secretary Vilsack, Secretary Raimondo, Commissioner Rosenworcel, and Director Deese:

We welcome the Biden Administration's commitment to deploying affordable, high-speed broadband across the country to help bridge America's digital divide and remedy persistent digital inequities. As you pursue this important goal, we strongly urge you to update federal broadband program speed requirements to reflect current and anticipated 21st century uses and align the definition of what constitutes high-speed broadband service across federal agencies.

Going forward, we should make every effort to spend limited federal dollars on broadband networks capable of providing sufficient download and upload speeds and quality, including low latency, high reliability, and low network jitter, for modern and emerging uses, like two-way videoconferencing, telehealth, remote learning, health IoT, and smart grid applications. Our goal for new deployment should be symmetrical speeds of 100 megabits per second (Mbps), allowing for limited variation when dictated by geography, topography, or unreasonable cost. While we recognize that in truly hard-to-reach areas, we need to be flexible in order to reach unserved Americans, we should strive to ensure that all members of a typical family can use these applications simultaneously. There is no reason federal funding to rural areas should not support the type of speeds used by households in typical well-served urban and suburban areas (e.g., according to speedtest.net's January 2021 analysis, average service is currently 180 Mbps download / 65 Mbps upload with 24 milli-sec latency[1]).

Broadband is increasingly critical to every aspect of our society and economy. During the COVID-19 pandemic, Americans have relied on high-speed broadband more than ever. It has allowed millions of Americans to continue working to support themselves and their families.

[1] https://www.speedtest.net/global-index/united-states#fixed

Broadband has helped millions of students maintain their education and provided patients access to vital care through telemedicine services. It has also given family and friends a way to connect in this difficult time while supporting social distancing. All of these vital economic, social, and healthcare-related functions are only possible with access to adequate broadband, the demands for which only continue to increase. Over the next five years, if current trends hold, data needs are expected to increase annually by at least 25% per year, according to the International Data Corporation.[2] The goal of universal service requires that all Americans have affordable broadband with the technical capacity to meet those needs equitably.

The pandemic has reinforced the importance of high-speed broadband and underscored the cost of the persistent digital divide in our country. According to the Federal Communications Commission (FCC), roughly 14.5 million Americans still lack access to broadband, and other studies estimate this number could be as high as 162 million.[3][4] Unfortunately, the FCC data continually overestimates broadband connectivity due to outdated mapping and poor data collection methods. We now have multiple definitions across federal agencies for what constitutes an area as served with broadband, resulting in a patchwork without one consistent standard for broadband. For example, the FCC defines high-speed broadband as download speeds of up to 25 megabits per second and upload speeds of up to 3 megabits per second (25/3 Mbps). Alternatively, the U.S. Department of Agriculture (USDA) defines it as just 10/1 Mbps. While it is important to update standards for federally funded projects, we also recognize that there are many Americans who lack access to even minimal service. If we do not prioritize unserved Americans before upgrading to higher speeds, then we will only increase the digital divide further.

Ask any senior who connects with their physician via telemedicine, any farmer hoping to unlock the benefits of precision agriculture, any student who receives livestreamed instruction, or any family where both parents telework and multiple children are remote learning, and they will tell you that many networks fail to come close to "high-speed" in the year 2021. For any of these functions, upload speeds far greater than 3 Mbps are particularly critical. These challenges will not end with the pandemic. In the years ahead, emerging technologies such as cloud computing, artificial intelligence, health IoT, smart grid, 5G, virtual and augmented reality, and tactile telemedicine, will all require broadband networks capable of delivering much faster speeds, lower latency, and higher reliability than those now codified by various federal agencies.

We must learn from our experience during the pandemic and raise federal standards for new broadband service to require low latency, high reliability, and speeds that meet our expected 21st century needs. We should also insist that new networks supported with federal funds meet this higher standard, with limited exceptions for truly hard-to-reach locations. For years, we have seen billions in taxpayer dollars subsidize network deployments that are outdated as soon as they are complete, lacking in capacity and failing to replace inadequate broadband infrastructure.

We need a new approach. We urge you to work together to establish one consistent, modern baseline definition of high-speed broadband service and underlying infrastructure specifications

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[2] https://www.idc.com/getdoc.jsp?containerId=prUS46286020
[3] https://docs.fcc.gov/public/attachments/FCC-21-18A1.pdf
[4] https://news.microsoft.com/rural-broadband

across the federal government and a coordinated approach to deploy funding efficiently where it is most needed. This would also reduce redundancy and make it easier for state, local, and private partners applying for support, while complementing provisions in the end of year relief COVID-19 relief bill directing the National Telecommunications Information Agency to work with federal agencies to streamline existing broadband programs.

The United States has long taken pride in our position at the vanguard of technological innovation and global competitiveness. If we want to maintain that leadership in the 21st century and ensure every American has access to economic opportunity regardless of where they live, we need to make sure that federal standards and strategies for essential technology services like broadband reflect our true needs today and future demands for connectivity.

Sincerely,

Michael F. Bennet

Angus S. King, Jr.

Rob Portman
United States Senator

Joe Manchin III
United States Senator

March 22, 2021

The Honorable Frank Pallone
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Cathy McMorris Rodgers
Ranking Member
Committee on Energy and Commerce
U.S. House of Representatives
2322 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Pallone and Ranking Member McMorris Rodgers:

The GPS Innovation Alliance (GPSIA) and the CompTIA Space Enterprise Council jointly submit this letter in support of today's hearing entitled, "LIFT America: Revitalizing our Nation's Infrastructure and Economy."

America has a history of creating infrastructure milestones that have led to significant prosperity and national advantages. During the 1950s and 1960s, our nation was transformed by explosive growth in its public infrastructure ecosystem. That ecosystem allowed America to prosper by bridging communities and creating regional pockets of innovation. Coupled with the Space Race with the Soviet Union, the 20th century infrastructure ecosystem helped make America a technological superpower.

Now we have the opportunity to create a 21st century national infrastructure that will benefit all Americans. In almost every aspect of our infrastructure ecosystem, the Global Positioning System (GPS), a constellation of satellites located 12,500 miles above the earth, has played an integral role. The three capabilities derived from the constellation are Positioning, Navigation, and Timing. All three play key roles in the infrastructure ecosystem. According to the Department of Transportation, Positioning is the ability to accurately and precisely determine one's location and orientation two-dimensionally (or three-dimensionally when required), Navigation is the ability to determine current and desired position (relative or absolute) and apply corrections to course, orientation, and speed to attain a desired position anywhere around the world, from sub-surface to surface and from surface to space. Timing is the ability to acquire and maintain accurate and precise time from a standard (Coordinated Universal Time, or UTC), anywhere in the world and within user-defined timeliness parameters. Similarly, communication satellites provide voice, video, and data supporting aviation, defense, banking, and agriculture.

A 21st century infrastructure ecosystem includes transportation (roads, bridges, ports, and airports), water (public utilities) and energy (electric grid) that is layered by cross-cutting smart technology and enabled by ubiquitous broadband connectivity and sensors. Our infrastructure is urban, suburban, and rural, impacting every single American.

As we invest in our infrastructure, we must take into account emerging technologies for both the physical infrastructure (new durable materials) and the digital tier that makes the physical infrastructure smart. These technologies range from commercial earthmoving and grading

equipment that use GPS to digital 3D models that can help streamline the construction process. When we utilize commercially-proven and competitively acquired technologies, we can improve efficiency, productivity and reduce delays associated with the engineering, construction and operation of infrastructure projects. All of this translates into substantial savings, both in terms of new and existing spending.

Whether in the air or on the ground, it is imperative that we invest the resources needed to build a 21st century infrastructure. The *status quo* of aging bridges and not yet universal broadband connectivity is simply unacceptable. We must aim for American exceptionalism. Our GPS constellation will play a leading role in that exceptionalism. GPSIA and the CompTIA Space Enterprise Council appreciate the opportunity to share this perspective with the Committee and stand ready to work with you on efforts to advance our nation's infrastructure while promoting, protecting, and enhancing GPS and other communication satellites.

Sincerely,

J. David Grossman
Executive Director
GPS Innovation Alliance

David Logsdon
Senior Director, Public Sector
CompTIA

Tom Frieden, M.D., M.P.H., President and CEO, Resolve to Save Lives, Former Director, Centers for Disease Control and Prevention

**The Honorable Frank Pallone, Jr. (D-NJ)**

1. Dr. Frieden, thank you for your work and dedication to national and global health. I would like to discuss another incredibly important provision within the public health infrastructure title of this bill.

Section 4005 provides $5 billion for infrastructure improvements at facilities funded by the Indian Health Service (IHS), which provides care to over 2 million American Indians and Alaska Natives across the country. It is important to note that Congress works in tandem with IHS and consults with tribal governments to establish a sound budget and identify culturally competent best practices.

The past year has been incredibly challenging for tribal communities. They've experienced some of the worst per capita infection rates and many areas lack accessible care. Apart from our statutory responsibility, it is our moral obligation to work with IHS and tribal governments to improve health care for Native Americans. Our investment in IHS infrastructure will go a long way toward achieving those goals.

1. Why is it important to modernize IHS facilities and how can we incorporate tribal health into broader public health?

   As you know, the U.S. government has legal trust responsibility to uphold the treaty responsibility for health care of Tribes, including through the Indian Health Service (IHS). As you also know, the health status of many tribal populations is precarious, with a much higher rate of many health problems, such as diabetes, and therefore a higher need for health and mental health services. Many IHS facilities have been long overdue for upgrading physical spaces and medical technology. This would improve patient care and increase facility patient capacity. These IHS health systems can be incorporated into the broader public health and health care system through focused programs, including cooperative grants to help state and local health jurisdictions work more collaboratively with IHS, Tribal and Urban Indian Health Organizations. Additionally, there is a need to inform the broader public health community about American Indian and Alaska Native (AI/AN) culture and history. "Public health practitioners and policy makers are often unaware of important concepts such as federal Indian law, trust responsibility, sovereignty, self-determination, consultation requirements, and research abuses. Many data challenges limit the quality of information available about the American Indian/Alaska Native population, resulting in under-reporting and misrepresentation of the public health conditions affecting the population." (*Priorities in Tribal Public Health* APHA, TPEH). We must additionally strengthen cooperative case investigation and reporting through improved public health laws, MOAs/MOUs and data sharing agreements that recognize tribes as sovereign nations with public health authority for their people.

Having full-time tribal liaisons within local and state health departments could bridge some of the gap between these jurisdictions. Some state health departments such as the Oregon Health Authority and Utah Department of health have adopted this model where a representative of IHS or designated tribal liaison has an office at the state health department.

2. Urban Indian Organizations play a critical role in increasing access to health care for native populations. Health IT infrastructure is critical to identifying and monitoring these patients. How can we better identify gaps in data and needs for new data collection?

Throughout the COVID-19 pandemic, the gaps in public health data collection and sharing were glaring across the entire country, especially in communities greater social vulnerability such as tribal populations. The need to upgrade, increase information security, and make health IT systems interoperable is clearer than ever.

Policy makers and public health professionals can identify gaps by evaluating existing health IT systems, asking the key users (health care staff, health care laboratory staff, public health, first responders) what they found were the biggest gaps and needs. However, one challenge with this approach is that system users may not be aware of what enhancements would be most valuable. Previous efforts to identify these gaps have found that areas to prioritize are:

- Reviewing and modifying existing Federal policies and regulations that present barriers to information exchange (e.g. the Privacy Act and Part 2 additions, HIPAA, etc.) by developing standards that both safeguard protected health information and facilitate the sharing of that information between jurisdictions following the same standards.
- Improving the exchange of information between Tribal programs and IHS, and between IHS, Tribal and Urban programs in States and local health jurisdictions.
- Expanded funding and incentives for Tribes to adopt new, certified Electronic Health Record (EHR) systems
- Continued support for IHS Health IT modernization efforts.

3. How does tribal health infrastructure fit into national health security?

Diseases know no borders. Preventing the spread of an infectious disease on Tribal lands is critical to the containment of any disease with pandemic or epidemic potential. Providing enhanced infectious disease detection and reporting capabilities to IHS and Tribal facilities can increase the representation of this information from predominantly rural areas.

IHS, Tribal and Urban programs have been recognized for their success in the COVID vaccination program. AI/AN have the highest per capita uptake of these vaccines

compared to other races/ethnicities. Other health systems can learn from those successes for future rural vaccine distribution efforts.

National health security is a collective responsibility among Federal, State, Tribal, Local, and Territorial governments and public private partners and members of the community to enable a whole-of -government, whole-of-nation approach, as outlined in the 2019-2022 National Health Security Strategy, US Department of HHS. Tribal nations are integral to meet the 3 objectives in the Strategy:

- **Prepare, mobilize, and coordinate the Whole-of-Government to bring the full spectrum of federal medical and public health capabilities to support State, Local, Tribal, Territorial, (SLTT) authorities in the event of a public health emergency, disaster, or attack.**

- **Protect the nation from the health effects of emerging and pandemic infectious diseases and chemical, biological, radiological, and nuclear (CBRN) threats.** From an infectious disease perspective, Tribal health infrastructure can help identify new infectious diseases in less urban areas that could spread to urban areas. Example: Tribal health infrastructure and IHS were crucial in identifying a new pathogen (hantavirus) as the cause of deaths in the Four Corners Area in 1993. (CDC). Interestingly, "The Navajo Indians, a number of whom contracted HPS [hantavirus pulmonary syndrome] during the 1993 outbreak, recognize a similar disease in their medical traditions, and associate its occurrence with mice."(CDC)

- **Leverage the capabilities of the private sectors**
    1. For fostering creation of resilient medical supply chain:

       Some tribes were able to choose where to get medical supplies for COVID-19 including testing kits, PPE, and vaccines through the US government and also private sectors either directly or indirectly (through state health department partnerships). For example, one tribe partnered with the state health department's emergency operations center for COVID-19 to get on the list to order PPE from a private company who is working with the state. And, concurrently the tribe can access the Strategic National Stockpile for similar supplies.

    2. For sustaining and improving private sector health care surge capacity for large-scale incidents:

       In addition to US Public Health Service/IHS health care professionals, some tribes could use the National Guard and people from the Medical Reserve Corps. Other options may include utilizing traveling nurses, locum tenens services and NGO's.

Thank you, Dr. Frieden. I want to reiterate that the health of our tribal communities is an indicator of our solvency as an advanced country and economy. The pandemic has disproportionately affected our most vulnerable communities, which were already living with pre-existing health inequality. Our return to normalcy must not leave anyone behind. I hope my colleagues will join me in that commitment.

**The Honorable Michael C. Burgess (R-TX)**

1. Initially established in the 1940s, Hill-Burton gave hospitals and other health facilities construction money in exchange for those providers offering a reasonable volume uncompensated and charity care to patients unable to pay. Things have changed a lot since the 1940s. For example, in order to maintain their tax-free status, non-profit hospitals must provide care for those without insurance or the means to pay. In addition, the Emergency Medical Treatment and Labor Act, or EMTALA, requires anyone coming to an emergency department to be stabilized and treated, regardless of insurance status or ability to pay. Disproportionate Share Hospital, or DSH, payments provide additional funding to hospitals that serve a disproportionate number of low-income patients. On top of that, in order to receive 340B drug discounts, a hospital must have a sufficient Medicare DSH adjustment percentage. In the outpatient space, community health centers are required to primarily treat those with limited ability to pay.

a. That said, given the many incentives already in place, how would Hill-Burton infrastructure payments increase the provision of uncompensated care?

Thank you for that question. As you know, hundreds of rural hospitals have struggled and as of 2020, 136 of these rural hospitals closed since 2010. Of the states that have seen at least one rural hospital close over the past decade, Texas led with 21 rural hospital closures.

Rural and urban hospitals care for communities and populations often with the greatest health and socioeconomic needs. They care for underrepresented people and are a health care anchor for communities across the country. They reach outside their walls to care for communities where more than 23 million people live below the federal poverty line, nearly 10 million have limited access to nutritious food, and 360,000 experience homelessness. However, those walls and basic medical infrastructure are crumbling. An article last spring detailed the experience of one hospital in New York City, SUNY Downstate, at the onset of the COVID-19 pandemic. It served a community that sees high numbers of low-income patients and patients of color and accommodates more than three times the number of patient visits than it was built to handle nearly 60 years ago. During the height of the COVID-19 crisis in New York State last spring, which disproportionately harmed populations served by the hospital, clinicians cared for patients with handmade workarounds, such as “plastic tarps and duct tape” to separate patients. The article reported that a “leaky roof forced a temporary evacuation of

premature babies from a neonatal intensive care unit" and that the "bunkerlike concrete building is crumbling from within."

Additionally, physical infrastructure investments should be paired with digital investment in upgrading EMR systems and enabling safety net providers to leverage telehealth capabilities to reach beyond their walls and into the communities where their patients live and work.

- **The Honorable Robert Latta (R-OH)**

1. The CARES Act provided $500 million in discretionary appropriations to modernize the public health infrastructure in the United States. To that end, Congress has passed hundreds of millions of dollars due to the COVID-19 pandemic to address the needs of our health providers during this crisis. It is Congress's responsibility to assess total costs and timelines in order to review appropriate actions. Do you believe that moving forward without this information is irresponsible of Congress and hurtful to the American taxpayer?
2. For example, one section of this bill provides $1 billion to the CDC to expand and improve public health infrastructure and activities. Why is this funding needed when the CARES Act provided $500 million in discretionary appropriations for public health data surveillance and analytics infrastructure modernization and the American Rescue Plan provided $500 million in mandatory appropriations for these same functions? CBO projected that only one fifth of that money would be spent over the next 7 months.

I believe we are spending money we don't have to address problems that have already received funding.

As you know, our U.S public health infrastructure was underfunded for decades at the federal, state, and local levels. As a result, our nation was woefully underprepared for this devastating pandemic. More than 56,000 public health workforce jobs at the state and local levels were cut between 2010 and 2020.[1] In the United States, per capita spending on public health is less than 3% of total health care expenditures, and if the pandemic has taught us anything it should be that preventing the spread of infectious disease both domestically and globally is a national security and economic imperative.

The emergency appropriations divided over several supplemental bills to respond to the COVID-19 pandemic were critically necessary to save lives and stabilize our economy. However, these supplemental appropriations were not long-term investments. They were more like plugging a sinking boat with a very expensive plug. Had our nation made the decision to invest in public health and preparedness prior to the pandemic we could have saved trillions in economic recovery costs, and billions in public health response costs.

[1] https://www.tfah.org/report-details/publichealthfunding2020/

As you indicated in your question, our public health data infrastructure was one area where public health was decades behind. At the start of the pandemic, it was common for test results to be delayed because labs would have to use fax machines to send results between providers and health departments. Additionally, data sent from health departments to HHS would lack basic information such as sex, age, race, etc. The initial funding provided by Congress for modernizing our public health data infrastructure in the CARES Act was another example of where the emergency appropriations were only playing catchup with a down payment after years of underinvestment. These funds must be sustained, and I support the goals of the LIFT Act to provide CDC with flexible sustainable resources to cover underfunded areas including workforce capacity, health information, disease surveillance, and other critical core public health needs.

To your question of oversight, when I was CDC Director, I took the first line of the agency's pledge to the American people very seriously: "Be a diligent steward of the funds entrusted to our agency."[2] I agree with you that Congress has the power of the purse and should conduct all appropriate oversight of the funds appropriated to CDC and all other associated COVID-response agencies. However, I believe that Congress can both conduct oversight and make investments to prevent the next pandemic now by finally making sufficient sustainable investments in our nation's public health infrastructure to ensure the taxpayers never again have to suffer through a pandemic that costs hundreds of thousands of lives and trillions of dollars. As Rep. Tom Cole said, "it is a no brainer to spend billions to save trillions."[3]

- **The Honorable Earl L. "Buddy" Carter (R-GA)**

1. Dr. Frieden, there is a growing recognition that part of the public health response includes social determinants of health, including non-emergency medical transportation (NEMT) to health services such as vaccine sites at community pharmacies. While Medicaid beneficiaries have access to a non-emergency medical transportation (NEMT) benefit, Medicare beneficiaries do not. I have introduced a bipartisan bill, H.R. 2080, that would authorize a temporary Medicare benefit to get beneficiaries to and from vaccination sites. Do you agree on the importance of transportation to vaccine sites if we are to get all of our Medicare beneficiaries vaccinated against COVID-19?

Thank you for this question. As you indicated, there is extensive research that concludes addressing social determinants of health is important for improving health outcomes and reducing health disparities. The COVID-19 pandemic exacerbated already existing health disparities for a broad range of populations, but specifically for people of color. The legislation you have proposed could have positive effects in closing some of those gaps by ensuring all seniors have affordable access to and from COVID-19 vaccination

[2] https://www.cdc.gov/about/organization/pledge.html
[3] https://thehill.com/policy/finance/496369-key-lawmakers-eye-off-budget-account-for-pandemic-speding

sites, especially those with limited mobility and in rural areas. Reducing barriers to vaccination, including the cost and convenience of transportation, is a proven and important way of improving vaccination uptake. Ensuring the most vulnerable members of our population are all vaccinated should be our highest priority and I commend you on this bipartisan legislation that could bring us a step closer to that goal.