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EXAMINING AMERICA'S NUCLEAR WASTE MANAGEMENT AND STORAGE

HEARING

BEFORE THE

SUBCOMMITTEE ON
THE INTERIOR, ENERGY, AND ENVIRONMENT

OF THE

COMMITTEE ON OVERSIGHT
AND GOVERNMENT REFORM
HOUSE OF REPRESENTATIVES

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CONTENTS

	Page
Hearing held on September 26, 2017	1

WITNESSES

Mr. Anthony J. O'Donnell, Commissioner, Maryland Public Service Commission, Chair, National Association of Regulatory Utility Commissioners, Subcommittee on Nuclear Issues, Waste Disposal	
Oral Statement	4
Written Statement	7
Mr. Chuck Smith, Council Member, Aiken County, South Carolina on behalf of Energy Communities Alliance	
Oral Statement	15
Mr. David G. Victor, Chairman, San Onofre Nuclear Generating Station, Community Engagement Panel, Professor, UC San Diego School of Global Policy & Strategy	
Oral Statement	16
Written Statement	19
Dr. Edwin Lyman, Senior Scientist, Global Security Program, Union of Concerned Scientists	
Oral Statement	27
Written Statement	29
Ms. Katie Tubb, Policy Analyst, Institute for Economic Freedom, The Heritage Foundation	
Oral Statement	39
Written Statement	41

APPENDIX

Statement for the record by Senator Dean Heller of Nevada, submitted by Chairman Farenthold	64
The Costs of Inaction on Nuclear Waste Management, submitted by Mr. Palmer	68
Questions for the record for Mr. Anthony O'Donnell, submitted by Chairman Farenthold	71
Questions for the record for Mr. Chuck Smith, submitted by Chairman Farenthold	74
Questions for the record for Ms. Katie Tubb, submitted by Chairman Farenthold	78

EXAMINING AMERICA'S NUCLEAR WASTE MANAGEMENT AND STORAGE

Tuesday, September 26, 2017

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON THE INTERIOR, ENERGY AND ENVIRONMENT
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
Washington, D.C.

The subcommittee met, pursuant to call, at 1:04 p.m., in Room 2154, Longworth House Office Building, Hon. Blake Farenthold [chairman of the subcommittee] presiding.

Present: Representatives Farenthold, Gosar, Ross, Palmer, Comer, Gianforte, Raskin, and Gomez.

Also Present: Representatives Issa and Clay.

Mr. FARENTHOLD. The Subcommittee on the Interior, Energy, and the Environment will come to order.

Without objection, the chair is authorized to declare a recess at any time.

Without objection, we are going to allow Mr. Clay to sit in, a member of the full committee, to participate in this subcommittee. Without objection, so ordered.

Good afternoon. Today, the Subcommittee on the Interior, Energy, and the Environment will examine America's nuclear waste management and storage.

Over the last 40 years, the U.S. produced 76,000 metric tons of nuclear waste. That's enough volume to cover a football field 24 feet high. This waste is scattered around our cities at nuclear power plants and other facilities because our country can't get moving on a proper long-term plan for storage and disposal.

Today, we'll explore our existing regulations for nuclear waste management and possible opportunities for improvement.

The Nuclear Waste Policy Act, or NWPA, of 1982 directed the Department of Energy, aka the DOE, to develop a national repository for the permanent disposal of nuclear waste. Way back in 1987, the Yucca Mountain Nuclear Waste Repository in Nevada was designated as this site. The DOE submitted a licensing application for Yucca Mountain to the Nuclear Regulatory Commission in 2008. However, the Obama administration's disapproval of the proposal and a series of court cases significantly delayed the application's review. Today, the Nuclear Regulatory Commission has yet to approve the license for Yucca Mountain rendering the site unusable.

To cover the cost of permanent removal, the NWPA established a Nuclear Waste Fund to collect fees under contractual obligation

from nuclear power utilities in exchange for removal of nuclear waste. The DOE has, in fact, collected around $750 million annually, despite their inability to dispose the utility's nuclear waste. The DOE now owes roughly $29 billion in liabilities since they failed to fulfill their contracts.

With nearly 2,000 metric tons of nuclear waste produced each year, the need for a long-term storage solution is becoming crucial. In my home State of Texas, there's currently a site in Andrews County used for low-level radioactive waste. A licensing application to upgrade the sight to an interim nuclear repository was submitted to the NRC. But similar to Yucca Mountain, the application faced numerous roadblocks ultimately stalling, in their view, process.

Due to the barriers faced in establishing a national repository, nuclear power of utilities often store nuclear waste in reactor sites. This is costly and unsustainable over the longterm and places significant burdens on the communities that house them. The Federal Government has a designated site and the resources necessary to make it operational, yet has struggled every step of the way to get the approval required to move forward. It's been 35 years since the passage of the Nuclear Waste Policy Act, and we have hardly anything to show in that time period, despite billions of dollars spent. We have to find a way to move past the gridlock.

I look forward to hearing ideas and suggestions from our panel, and am hopeful the committee can create solutions to improve the management and storage of America's nuclear waste.

At this point, I will yield 5 minutes to Mr. Raskin, the acting ranking member, as Ms. Plaskett is detained in the U.S. Virgin Islands for obvious reasons.

Mr. RASKIN. Mr. Chairman, thank you for holding this important hearing. And welcome to all of our fine witnesses, including my former colleague from the Maryland General Assembly, Mr. O'Donnell. It's really good to see you.

And I am serving in the place of our distinguished ranking member, my friend and former law student, Ms. Plaskett, who is attending to her constituents in the U.S. Virgin Islands who are struggling to recover from the devastating hurricane and all the flood damage. They are in our thoughts, and prayers are with her and with her constituents.

I greatly appreciate the opportunity to discuss an issue on the minds of a lot of Americans. Nuclear waste storage is a pressing nationwide concern that requires a nationwide solution. There are currently over 700,000 metric tons of spent nuclear fuel in our country, an additional 13,000 metric tons from defense-related activities. This radioactive waste is currently being stored at dozens of deteriorating nuclear storage sites across America. And I believe we can all agree that this is not a viable or safe long-term solution.

I believe we can also agree that our government owes the American people an effective plan to address the nuclear waste storage problem. We owe the American people a plan that allows for nuclear waste to be stored securely in the manner that does not poison the environment and that presents no public health and safety concerns for local communities.

Questions about the soundness and safety of our current storage regime and facilities are not new. In recent years, we've seen several disturbing incidents that have brought into question our ability to safely store this dangerous material in communities across the land.

Internationally, the nuclear disaster at the Fukushima plant caused by an earthquake and a tsunami is still a vivid and serious reminder of the dangers of nuclear power and escaped nuclear radiation. And it serves as a warning to all of us around the world of what can happen if we don't keep safety at the very forefront of our concerns.

So it's troubling to me that the Trump administration is moving swiftly to advance the Yucca Mountain facility. The President's proposed budget provides for $120 million to restart the licensing for this controversial plan. There are significant reasons why the repository at Yucca Mountain site originally selected 30 years ago has not yet been built. Yucca Mountain is seismically active and faces the possibility of continued and increased volcanic activity. Moreover, the facility comes with a known risk of radioactive waste leaking into the groundwater and contaminating the drinking water of nearby communities. Furthermore, the transportation of nuclear waste to Yucca Mountain would take it through 44 States and the District of Columbia, well over two-thirds of the country, nor have we fully considered the national security risks involved in transporting and storing this nuclear waste.

These significant concerns cannot be swept under the rug in a mad dash to get Yucca Mountain licensed. All of these environmental, public health, safety, transportation, and national security questions must be thoroughly answered before we determine that Yucca Mountain is the best site for nuclear waste storage.

There are so many difficulties involved in using Yucca Mountain to store nuclear waste that the Atomic Safety and Licensing Board Panel is considering approximately 300 different contingencies. It seems clear we should be considering alternative sites to act as a permanent repository. Looking forward whether we are discussing short- or long-term solutions, we must continue to make the public safety a paramount priority, and this means carefully considering environmental implications of all the sites.

As the people of Texas, Florida, Puerto Rico, the Virgin Islands desperately try to recover from record-force hurricanes and flooding damage, we must take stock of the fact that climate change is dramatically increasing the ferocity and the perils of natural disasters. No plan to safely dispose of and store nuclear waste is remotely complete if it does not take into account changes in weather patterns. It is also imperative that the Federal Government works with State and local governments to develop and implement effective solutions going forward.

I look forward to hearing today from people who are tackling these important issues.

Thank you very much, Mr. Chairman.

Mr. FARENTHOLD. Thank you.

Without objection, other members will have 3 legislative days to submit an opening statement. Additionally, without objection, Sen-

ator Dean Heller of Nevada has also submitted testimony. And without objection, we'll add that to the record as well.

Mr. FARENTHOLD. Now I'd like to introduce our witnesses.

We have Mr. Anthony O'Donnell, commissioner of the Maryland Public Service Commission, and chair of the Subcommittee on Nuclear Issues - Waste Disposal at the National Association of Regulatory Utility Commissioners. We have Mr. Chuck Smith, a councilman in Aiken County, South Carolina, and chairman of the Energy Community Alliance. We have Mr. David Victor, professor of international relations and director of the Laboratory on International Law and Regulations at UC San Diego, as well as chairman of the Community Engagement Panel at San Onofre Nuclear Generating Station. We have Dr. Edwin Lyman, senior scientist of—at the Union of Concerned Scientists Global Security Program. And Ms. Katie Tubb, policy analyst at the Heritage Foundation, Center for International Trade and Economics.

We welcome you all.

Pursuant to committee rules, all witnesses will be sworn before their testimony.

Would you please rise and raise your right hand.

Do you solemnly swear or affirm that the testimony you're about to give is the truth, the whole truth, and nothing but the truth, so help you God?

Let the record reflect all witnesses answered in the affirmative. And you all may be seated.

We all have your preprovided testimony. So in order to allow time for discussions and questions, I'd request you limit your time for your verbal testimony to 5 minutes. The clock in front of you shows the time remaining. It will turn yellow when you have 30 seconds remaining and turn red when your time's up. If you go way over, I'll start tapping the gavel to—in case you missed the clock.

So with that, we'll begin with Mr. O'Donnell. You're recognized for 5 minutes, sir.

WITNESS TESTIMONIES

TESTIMONY OF ANTHONY J. O'DONNELL

Mr. O'DONNELL. Thank you, Mr. Chairman.

Good afternoon, Chairman Farenthold and Acting Ranking Member Raskin and other members of the Subcommittee on the Interior, Energy, and Environment. Thank you for the opportunity to testify today on the lack of progress on nuclear waste disposal and its effect on ratepayers.

My name is Tony O'Donnell, and I'm a commissioner on the Maryland Public Service Commission. I also serve as chairman of the National Association of Regulatory Utility Commissioners, NARUC, Subcommittee on Nuclear Issues - Waste Disposal. Thank you for holding this hearing.

State economic utility regulators are responsible for ensuring the safe, reliable, and affordable delivery of essential electric utility services in every State across this country. The success of the Federal nuclear waste management program funded by the consumers of electricity generated from the Nation's nuclear power plants is necessarily of keen interest. Both NARUC and its member commis-

sions have dedicated a tremendous amount of time and resources to ensure that electricity consumers receive the services they have paid for.

State regulators agree that users of electricity for nuclear power plants should pay for the Federal—for the Federal nuclear waste management and disposal program, and the consumers have paid generously into this fund.

Since 1982, more than $40 billion in direct payments and interest have been paid into the U.S. Nuclear Waste Fund. In fact, the $40-plus billion the consumers have contributed to the fund is only part of the entire amount they have spent on nuclear waste.

First, consumers have paid for the original waste storage of facilities through the rates. Secondly, they paid into the Nuclear Waste Fund, as I just mentioned. Third, consumers paid to rerack or consolidate used fuel pools through the rates because the Federal Government failed to remove the waste by the statutory deadline. Fourth, they had to pay for onsite, out-of-pool dry cask storage through rates, again due to Federal failure. Finally, consumers paid a fifth time, through taxes paid for the Judgment Fund disbursements to cover damages caused by the failure of the Federal nuclear waste program.

With respect to the judgement fund, taxpayers from every State, even those whose utilities have no stake in nuclear-generated electricity, continue to fund court-awarded damages from the Department of Justice Judgment Fund for DOE's partial breach of its contracts with electric companies that required DOE to remove the used nuclear fuel.

According to a September 2014 DOE audit report, $4.5 billion in damages have already been paid as a result of the Federal Government inaction. DOE estimates the total liability for the Federal Government will be about $27 billion, subject to check, maybe it's $29 billion. But that estimate includes the unrealistic assumption that the Department can begin to accept used nuclear fuel by 2021. Industry estimates almost double that projection. Even former President Obama's Blue Ribbon Commission estimated that every year of delay in accepting used nuclear fuel will increase this liability by approximately $500 million. Yet for those billions, so far ratepayers in the country have nothing to show for it.

The Federal Government missed its statutorily mandated deadline to start accepting nuclear mandate—nuclear waste in 1998. In the 1990s and early 2000s, at least the program had shown progress, notwithstanding the missed deadline.

However, since that time, efforts to block funding for a geological disposal of nuclear waste at Yucca Mountain as well as the U.S. Department of Energy's unlawful refusal to support the project's licensing application has kept the country in the exact same situation we occupied 30 years ago when Congress decided—I reiterate, Congress decided—that Yucca Mountain should be the first site considered for the United States permanent repository.

The United States needs and—needs and consumers have paid for a permanent storage solution, and nothing less. To put it bluntly, the States and localities have the Federal Government's waste, and the Federal Government has our money.

Thank you again, Mr. Chairman, for the opportunity to be part of this critical discussion.

[Prepared statement of Mr. O'Donnell follows]

Testimony on behalf of the
National Association of Regulatory Utility Commissioners (NARUC)

by

The Honorable Anthony J. O'Donnell
Commissioner, Maryland Public Service Commission
Chairman, NARUC Subcommittee on Nuclear Issues-Waste Disposal

before the

United States House of Representatives
Committee on Oversight and Government Reform
Subcommittee on the Interior, Energy and Environment

hearing entitled

"Examining America's Nuclear Waste Management and Storage"

September 26, 2017

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Good morning Chairman Farenthold, Ranking Member Plaskett, and members of the Subcommittee on the Interior, Energy, & Environment. Thank you for the opportunity to testify today on the lack of progress on nuclear waste disposal and its effect on ratepayers. My name is Tony O'Donnell, and I am a Commissioner on the Maryland Public Service Commission. I also serve as the Chairman of the National Association of Regulatory Utility Commissioners (NARUC) Subcommittee on Nuclear Issues – Waste Disposal.

NARUC is a non-profit organization founded in 1889. Our members are the public utility commissions in all 50 States and the U. S. territories. NARUC's mission is to serve the public interest by improving the quality and effectiveness of public utility regulation. Our members regulate the retail rates and services of electric, gas, water, and telephone utilities. We are obligated under the laws of our respective States to assure the establishment and maintenance of essential utility services as required by public convenience and necessity and to ensure that these services are provided under rates, terms, and conditions of service that are just, reasonable, and non-discriminatory.

State economic utility regulators are responsible for ensuring the safe, reliable, and affordable delivery of essential electric utility service in every State across the country. The success of the federal nuclear waste management program, funded by the consumers of electricity generated from the nation's nuclear power plants, is necessarily of keen interest. Both NARUC and its member commissions have dedicated a tremendous amount of time and resources to ensure that electricity consumers receive the services they have paid for.

NARUC and its State Commission members were at the table when the Nuclear Waste Policy Act of 1982 (NWPA) was developed and passed. At that time, and today, State regulators agree that users of electricity from nuclear power plants should pay for the federal nuclear waste management and disposal program and the consumers have already paid generously into the fund. Since 1982, more than $40 billion in direct payments and interest have been paid into the U.S. Nuclear Waste Fund (NWF).

In fact, the $40 plus billion that consumers have contributed to the NWF is only part of the entire amount they have spent on nuclear waste. First, the consumers paid for the original waste storage at the facilities through their rates. Second, they paid into the NWF, as already mentioned. Third, the consumers paid to rerack, or consolidate, used fuel pools, again through their rates, because the federal government failed to remove the waste by statutory deadline. Fourth, they had to pay for on-site, out-of-pool dry cask storage, again through rates, again due to federal failure. Finally, consumers pay a fifth time, through taxes paid for Judgment Fund disbursement to cover damages caused by the failure of the federal nuclear waste program. A brief discussion of Judgment Fund disbursement will be discussed below.

Yet, for those billions, so far, ratepayers – and the country – have nothing to show for it. The federal government missed its statutorily mandated deadline to start accepting nuclear waste in 1998. In the 1990s and early 2000s, at least the program had shown progress, notwithstanding the missed deadline. However, since that time, efforts to block funding for the geologic disposal of nuclear waste at Yucca Mountain, as well as the U.S. Department of Energy's unlawful refusal to support the project's licensing application, has kept the country in the exact same situation

we occupied 30 years ago when Congress decided that Yucca Mountain should be the first site considered for the United States permanent repository.

In 2010, after decades of scientific study and an investment of over $11 billion in the Yucca Mountain repository, the Obama Administration – without any record of public process – unilaterally declared the site not "practical" and "unworkable," purported to withdraw the Yucca Mountain license application, and began dismantling the program, closing the DOE Office of Civilian Radioactive Waste Management. NARUC was one of many voices that opposed this attempt and was a petitioner in the mandamus action that required the Nuclear Regulatory Commission to expend outstanding appropriations on the Yucca Mountain license review.

Today, there is no nuclear waste program worthy of the name, despite the exhaustive studies and billions in ratepayer and taxpayer dollars spent. All that remains is the nuclear waste, which sits on site at nuclear reactors, some of which are now closed. This is not only uneconomic. It undermines confidence in nuclear power.

The repercussions of the previous Administration's failure to take possession of and remove nuclear waste, as well as develop the Yucca Mountain site have been substantial. Taxpayers from every State, even those whose utilities have no stake in nuclear-generated electricity, continue to fund court-awarded damages from the Department of Justice Judgment Fund for DOE's partial breach of its contracts with electric companies that required DOE to take title to used fuel.

Let's examine those damages. According to a September 2014 audit, $4.5 billion in damages has already been paid as a result of federal government inaction. DOE estimates the total liability for the federal government will be about $27 billion, but that estimate includes the optimistic assumption that the department can begin to accept used nuclear fuel in 2021. Industry estimates almost double that projection. Even former President Obama's Blue Ribbon Commission (BRC) estimated that every year of delay in accepting used nuclear fuel will increase this liability by approximately $500 million. All told, we are facing damages in the tens of billions of dollars.

The 31 States with retired and operating nuclear reactors have an even greater incentive to press for some reform in how the federal program is funded. There are currently over 74,000 metric tons of commercial spent fuel at reactor sites in the US. America's nuclear power reactors continue to produce roughly 2,000 tons of waste every year. The ratepayers in each of those States have contributed millions to the corpus of the Nuclear Waste Fund (NWF).

Access to the billions of dollars collected by the NWF is essential for any interim or permanent solution to nuclear waste disposal to succeed. As the BRC Report acknowledged, at 74:

[F]or the waste management program to succeed, the nuclear waste funding mechanism must be allowed to work as intended so that the ability to implement the waste program is not subject to unrelated federal budget constraints.

Congress holds the keys to make that progress happen. The budgeting and appropriations process for the waste disposal program must change. Currently, appropriations from the NWF are considered as part of the total federal

government budgeting process – not as allocation of the funds collected in the NWF.

That means any appropriations will score and increase the deficit. Appropriations for the waste disposal program remain under the spending cap applicable to all domestic programs, even though the NWF is self-financed.

This forces spending from the NWF to compete with other spending programs that never had a dedicated funding stream. This approach is unfair to ratepayers and inappropriate for a fund designed to finance the extremely protracted life-cycle of a capital-intensive disposal program. It makes no sense to treat funds collected specifically to support the disposal of used commercial reactor fuel as discretionary. Over the life of the program, this approach necessarily led to lower appropriations than were requested. *(BRC Report* at 72*)*. Reduced funding contributed to project and schedule delays (and obviously undermined the Yucca Mountain license review process.) Inadequate funding can only hamper efficient scheduling and planning thereby driving up costs.

NARUC believes that the NWF must be managed responsibly and be used only for its intended purpose. The program must have full access to the revenues generated by consumers' fee payments, if they resume, and to the balance of the NWF. This requires legislative changes to the NWPA.

As related previously, the U.S. government has not lived up to the promises made under the NWPA and subsequent Congressional enactments. This is not a matter of opinion, but of legal record, and of particular relevance to any discussion of the

NWF is the November 2013 D.C. Circuit decision granting NARUC's request that the DOE suspend collection of the NWF fees.

The NWPA required electricity ratepayers to fund a one mil (one tenth of a cent) per kilowatt-hour fee to fund the NWF. Under the NWPA, the Secretary of Energy is obligated to evaluate whether collection of the fee will provide sufficient revenues to offset program costs. In response to a suit filed by NARUC and the Nuclear Energy Institute (NEI), the United States Court of Appeals for the D.C. Circuit reasoned that the Secretary was not only responsible for reviewing the fee's adequacy, but also had an affirmative obligation to conduct an annual fee analysis. The court examined the last DOE fee assessment and found the Secretary's "determination" legally inadequate. The court identified many flaws in the DOE analysis. Among other things, it specified that the Administration could not logically deem Yucca Mountain unworkable and in the same sentence utilize it as a proxy to estimate the fee. The court chose, however, to remand and give the Secretary six months to comply with the NWPA by producing a revised fee assessment.

On January 16, 2013, DOE released its updated fee adequacy analysis. NARUC and NEI immediately filed a motion to reopen the proceeding. The court determined the updated assessment was also flawed. Ultimately, on November 19, 2013, in a sharply worded opinion, the court ordered DOE to request Congress set the fee to zero, rejecting its request for yet another chance to "redo" the assessment as "so obviously disingenuous that we have no confidence another remand would serve any purpose." The decision compares DOE's analysis to the musical "Chicago," where the lawyer sings "give them the old razzle dazzle." DOE's last

gasp request for both rehearing and rehearing *en banc* was denied on March 18, 2014. The fee was suspended shortly thereafter.

NARUC is open to the idea of interim solutions where nuclear fuel is stored, not at reactor sites, but at one or more central locations, pending the final development of a permanent repository once the application process begins again at the Nuclear Regulatory Commission. However, this approach must not become the same kind of accidentally long-term approach that on-reactor-site storage has become, due to an Administration's unwillingness or inability to permit Yucca Mountain. The United States needs, and consumers have paid for, a permanent storage solution – and nothing less. To put it bluntly, the citizens of States and localities have the federal government's waste and the federal government has our money.

Thank you again for the opportunity to be part of this critical discussion.

Mr. FARENTHOLD. Thank you very much.

Mr. Smith.

TESTIMONY OF CHUCK SMITH

Mr. SMITH. Chairman Farenthold and members of——

Mr. FARENTHOLD. Could you turn your microphone on, please, sir?

Mr. SMITH. Thank you for inviting me to testify today ensuring that the perspective of the local communities that host the government's defense nuclear waste facilities is represented. I am Chuck Smith, council member of Aiken County, South Carolina, board member of the SRS Community Reuse Organization, and chairman of Energy Communities Alliance.

Our communities have long played a key role supporting the Nation's national security efforts. Indulge me, please. I have two canisters of high-level waste from different locations. Scientists will tell you that both are radiologically the same material, yet it costs $10 billion to manage this material and $100 billion to manage this material. Why? Because DOE regulations make no sense.

I'd like to discuss defense high-level waste in an alternative path forward that can potentially reduce current cost estimates for addressing nuclear waste by upwards of $40 billion.

DOE produced defense nuclear waste through its reprocessing programs carried out as a part of the Manhattan Project and during the Cold War. DOE has 332 underground tanks used to process and store liquid high-level waste. The large tanks sit at three locations: Hanford, Washington; the Idaho National Laboratory; and in my State, Savannah River Site.

The defense high-level waste is ultimately destined for disposal at Yucca Mountain. ECA has long supported moving forward with the Yucca Mountain licensing process. A high-level waste repository is and remains essential. ECA also supports consolidated interim storage, but it must exist alongside a permanent solution and not instead of it.

As the "kick the can down the road approach" continues, I must remind you that our communities are already de facto interim storage sites. In addition, DOE and nuclear power producers are already incurring large costs paid for by taxpayers in your communities. GAO reported this year that DOE's environmental liability has doubled from a low of $176 billion in 1997 to an estimate of $372 billion in 2016. DOE has paid $6.1 billion in damages. That breaks down to 800 million annually, about $2.5 million per day. The cost of inaction is high.

So what can we do? ECA believes one option is clarifying the way nuclear waste is classified. Our country's radioactive waste clarification system currently relies primarily on point of origin rather than consumption or the specific hazards posed by its disposal. This approach does not make sense. Some defense high-level waste could technically qualify as transuranic waste, if based on its radioactive content. Only the U.S. classifies this nuclear waste this way.

Just this month, ECA released a white paper outlining five near-term actions we believe can help DOE cut years of operation: reduce the size and duration of storage facilities needed before a high-level waste repository is available, accelerate waste tank re-

trieval and closures, and, as I mentioned earlier, realize savings of more than 40 billion.

Our first two recommendations reflect a two-pronged approach. First, DOE should revise its order 435.1 to clarify that waste will be managed and disposed of according to characteristics rather than origin. DOE already has the authority to do this under the Atomic Energy Act. Congress should eventually provide statutory clarification to codify any clarification and reduce the chances it will shift over time along with politics and new administrations. However, any legislative language should support DOE's efforts and not get ahead of them. My community has started to develop its own legislative language, but we need to ensure that resources are available for local and State representatives around each impacted site to engage with their constituents, State policymakers, and congressional delegations to provide education and build support.

Our next two recommendations deal with WIPP. DOE must begin working with the State of New Mexico on a permanent modification—on a permanent modification for WIPP to allow some of the tank waste currently classified as high-level waste to go to WIPP if it meets waste-acceptance criteria. This could allow 2,300 canisters of waste at Savannah River that are already destined to safely go to WIPP rather than sit onsite waiting for a high-level repository to be operational. Congress and DOE should provide full funding for WIPP so the full range of disposal capabilities can be resumed and capacity ultimately increased.

And finally, DOE should begin to work on pilot projects and policy options to better understand alternative approaches. This includes considering how best to utilize private facilities such as WCS in Texas. Again, I caution it is imperative that DOE enter into discussions as early as possible with host communities and States to ensure there's a full understanding of the risk and benefits of any proposal. Impacted stakeholders must have the resources and opportunities necessary to participate in planning and provide feedback into policymaking process.

For many communities, trust in DOE has eroded over time, and transparency is paramount to our community's ability to support DOE decisions. Clarifying waste definition is a large departure from current policy, but current policy has not served us well. There are safe options, and the Federal Government must seriously consider them.

In closing, I appreciate the opportunity to appear before you today. I did bring copies of our report. ECA calls on you to support our communities and the country to move forward using science-based, not politically science-based, decision. We need to stop spending millions of taxpayers' dollars or fines rather than progress. It just makes sense.

Mr. FARENTHOLD. Thank you very much, sir.

Mr. Victor, you're up for 5 minutes.

TESTIMONY OF DAVID G. VICTOR

Mr. VICTOR. Thank you very much, Chairman Farenthold, Acting Ranking Member Raskin, Representative Gomez, members of the subcommittee. My name is David Victor. I'm a professor at UC San

Diego. I'm also a chairman of the Community Engagement Panel at San Onofre. This is a panel set up by Southern California Edison, the operator of the facility, to help steward the process of decommissioning of the San Onofre site, which is the largest commercial reactor site to be decommissioned to date.

I've submitted in advance my written testimony. I want to just focus on three remarks in the 5 minutes that I have here today, remarks based on what I'm hearing from the communities on the front lines around these plants.

The first comment is that the problem is now well-known. The Nation needs a solution. We do not have a solution to the long-term storage of spent nuclear fuel. But the situation today is radically different from what it was 10 years ago, and it's going to get worse quickly.

Today, there are 17 reactors at 14 sites on 11 States that are in the various stages of decommissioning, including the San Onofre plant. In the future, there will be more reactors in a similar situation.

At these sites, the visibility and the problems associated with the lack of a solution to the spent nuclear fuel problem are much more visible because they're an operating site, there's always fuel onsite, and the reactor core and pools onsite at cask storage. And a decommissioned site situation is totally different. And the deal that the communities expect is that when the plants are removed and the benefits from that plant are removed, that the spent fuel will be removed as well. And that deal is not being fulfilled.

The second of the three comments I'd like to make concerns Yucca Mountain. I understand that a lot of the politics around this issue in Washington are focused on Yucca Mountain. What I'm hearing from people on the front lines is very different. There's attention to Yucca Mountain, but there's much more attention to consolidated interim storage, or monitorable and retrievable storage, such as the sites mentioned in west Texas, another site in eastern New Mexico near the WIPP facility, and perhaps other sites in the future.

Over the last 3 years, our panel has spent a lot of time on this issue. And what we have learned is that it's important to view consolidated interim storage as a complement to Yucca Mountain. I understand that politically they can be complements, but the role of these interim facilities and helping get spent fuel out of these communities quickly is vital, because even with a restart of Yucca Mountain, there are going to be many delays. It's going to take a long time. And interim storage is a much more rapid response option.

In my testimony, I cite some of the work that's been done on the economics. Interim storage, in addition to help save money when developed in tandem with Yucca Mountain or other permanent storage facilities, it also gives us more options as a country, so that if one option doesn't work or if there are political troubles, the entire country is not held up by those difficulties as we have seen in the debate over the last few decades.

We have spent more time on this issue around the San Onofre communities than any other topic that our panel looks at. And the number one ask from those communities is to help accelerate an

overall strategy that involves permanent repositories as well as consolidated interim storage.

The third and last comment I'd like to make concerns all the progress that has been made in Washington and, to some degree, in the arms of the Federal Government around the possibilities of restarting Yucca and around making consolidated storage a reality. It's really striking how much has happened in the last few years and how much in particular this body has done on the legislative front. Maybe not quite as much progress over in the Senate yet, but we can hope.

I think the bill that's working its way through here is a big step forward, but it's a first step and additional work is needed. And I'd like to highlight two areas where we have learned about additional work that will be essential.

One of those areas concerns the order with which spent fuel is removed from sites and sent to an interim storage facility or a permanent repository. Current procedures are ambiguous about this but seem to envision a scenario where the oldest fuel will be taken first from lots of different sites around the country. What we hear from not just our communities, but other communities around decommissioned nuclear sites is they would like those fuels to be moved first, because in decommissioned sites, there is especially no logic for continued onsite presence of spent nuclear fuel.

And the other topic that needs more work is transportation. And current appropriations have some money needed for developing the railcar systems to move spent fuel. More work is needed on that front so we can develop a fleet of railcars, so that when real options appear, there are ways to get the fuel out of sites like San Onofre to permanent facilities.

I thank you very much for your interest and attention to these issues. We in the communities around plants such as San Onofre are living this on a daily basis, and we are encouraged by the potential progress on solutions. Thank you.

[Prepared statement of Mr. Victor follows:]

Testimony of Prof. David G. Victor, Chairman of the San Onofre Community Engagement Panel, before the House Oversight and Government Reform Subcommittee on Interior, Energy and Environment

Subcommittee Chairman Farenthold, Ranking Member Plaskett, and members of the subcommittee, including Representative Issa and Representative Gomez, thank you for the invitation to testify today about the national problem of storage and disposal of spent nuclear fuel. About 35 years ago Congress laid out a plan for long-term disposal of spent fuel from the country's nuclear reactors: the Nuclear Waste Policy Act (NWPA) of 1982. Since passage of that law, the government has consistently failed to meet key deadlines to remove spent fuel from the 99 operating commercial reactors at 59 sites around the country.[1] Worse, there are now 17 reactors at 14 sites in 11 states that are no longer operating—reactors, such as at San Onofre in Southern California where the spent fuel will remain stuck onsite long after the rest of the site has been shut down and removed.[2]

The Department of Energy has collected upwards of $750 million annually from customers into a fund that amassed $46 billion dollars by late 2016, the most recent audit.[3] These funds were intended to defray the cost of removal and long-term disposal of spent fuel. Instead, the funds sit essentially idle. A series of lawsuits has halted those payments for many utilities, and some utilities are now being paid damages from taxpayer funds to recover the cost of continued storage of their spent fuel beyond the time when it was supposed to be accepted by the government.

For many years, this persistent failure to perform was, outside the nuclear utility industry, largely unnoticed. Nearly all reactors that were built kept operating. Unable to ship spent fuel to a permanent repository they left it on site—in pools and in dry cask storage.

The situation today is completely different. While most of the US nuclear fleet continues to operate, a growing number of reactors are in the midst of decommissioning. For these sites, the inability to remove spent fuel is particularly deplorable. Local communities have seen most of the jobs associated with these reactors, along with many other benefits, disappear. They are watching massive deconstruction projects remove reactors domes, buildings and other facilities. Yet they are still left with the spent nuclear fuel onsite, without a proper home and without any indications as to when it will eventually be removed. Some solutions to this problem are coming into focus, but they require changes to federal law as well as new investments where Congress and the Administration must work together.

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[1] Kim Cawley, "Testimony: The Federal Government's Responsibilities and Liabilities Under the Nuclear Waste Policy Act," Before the Subcommittee on Environment and the Economy, Committee on Energy and Commerce, U.S. House of Representatives (3 December 2015).
[2] For detail see generally NUREG 1350. https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/
[3] Office of the Inspector General, DOE, "Audit Report," OAI-FS-17-04 (December 2016).

I testify today as Chairman of the San Onofre Nuclear Generating Station (SONGS) Community Engagement Panel (CEP). SONGS Units 2 and 3 are the largest commercial reactors slated for decommissioning in the country, and the political environment around the plant is more intense than almost anywhere in the country. I serve in that role as a volunteer. I am also a Professor at the School of Global Policy and Strategy (GPS) at UC San Diego where I am also an adjunct professor in Climate, Atmospheric Sciences and Physical Oceanography at the Scripps Institution of Oceanography.

Back in 2013 when the operator of the plant, Southern California Edison (SCE) decided to decommission the facility it also set up this panel to open a two-way conduit between SCE (and its co-owners, San Diego Gas and Electric, the City of Anaheim and the City of Riverside) and the communities that would be affected by the decommissioning process. Over the last three years the CEP has provided exactly that function. It has offered ways for SCE to learn about the concerns of the communities—for example; the impact of shrinking the SONGS emergency planning systems, now that the plant poses a lower hazard to the community, on the budgets of first responders, hospitals and other essential public services. It also offers a way for SCE to help inform the communities about how decommissioning will unfold; the economic and environmental impacts, and the various strategies being adopted to mitigate adverse impacts. We meet quarterly and have 17 members (with one vacancy)—all volunteers, drawn from the local communities and a blend of public officials, representatives from environmental NGOs, business, labor, and other stakeholders. We are not a formal decision-making body nor do we have official oversight functions—there are plenty of other bodies with those powers and responsibilities.[4] I speak today as a private citizen who happens to be Chairman of the CEP, and I reflect on what we have learned over the three years of CEP operation.

Without a doubt, one topic has attracted the most attention at our CEP meetings and in the local communities: spent fuel. As in any community, there are many different views about a technology like nuclear power. With the closure of SONGS, I thought, that many of those diverging viewpoints would become moot and the communities could come together and focus on the best plan for decommissioning. Instead, many people have been shocked to learn that decommissioning of the plant does not mean removal of everything—the spent fuel remains because there is no place to send it. By not offering a practical place and method to ship spent fuel the Federal government has, through inaction, created a whole new array of acrimonious debates and controversy within local communities about how best to steward the spent fuel. I have observed and been in the middle of those debates for three years and the rest of my testimony outlines what I have seen and learned.

[4] For more, including documents and video from every meeting, see www.songscommunity.com

The importance of moving the fuel out of local communities at decommissioned sites.

First, I can't emphasize enough the importance of offering practical ways for decommissioned sites to move spent fuel out of their communities to other, more appropriate locations. Offering a practical route to that outcome would be enormously valuable to our communities. That route could involve finishing Yucca Mountain and allowing consolidated interim storage (CIS), also known as interim storage facilities (ISF), and I'll talk about that next. But people are most looking for is a viable plan that addresses an urgent problem—a problem that is not so pressing in communities with operating reactors but is vitally important to those where reactors are undergoing decommissioning and will have stranded spent nuclear fuel left with reduced security at the decommissioning site.

We are particularly concerned that the current arrangements at the Department of Energy (DOE) are opaque about which spent fuels will ship first. This problem has not been important to solve over the last few decades because there was no place to ship. Today that might be different and I would urge Congress to help DOE develop a more coherent set of priorities. The current "standard contract" for fuel shipments, while ambiguous, suggests that the oldest fuel will ship first. That approach will create an inefficient and incoherent shipment pattern—with canisters moved across a patchwork of sites, and no site happy with the outcome. We should put the decommissioned sites first because those sites are no longer generating spent fuel, in most cases are removing reactors and support buildings, and gain much smaller economic benefit from hosting these facilities. By contrast, sites with operating reactors will always have spent fuel in their reactor cores, fuel pools and dry cask pads. For all these communities, it is important to have a viable long-term plan for spent fuel removal; for decommissioned sites the imperative is particularly compelling.

Political Realism

We in the San Onofre communities have learned that the politics of finding solutions to this problem are difficult. For years, Yucca Mountain has been a political lightning rod in ways that have made it exceptionally difficult—at times, impossible—to move forward with that site. The prospect of Consolidated Interim Storage might prove politically more tractable because, when combined with consent-based siting, it allows communities to nominate themselves to become storage sites. Following the guidance of the bipartisan Blue Ribbon Commission (BRC) report, we are encouraged that a process of informed consent has emerged and led to two communities volunteering themselves for CIS facilities. Today, my sense is that one of those sites is viable and that it enjoys healthy support from much of the local communities. The other site is owned by a company that paused its licensing process due to a planned acquisition which most likely will leave their CIS operations by the wayside. The viable site is in New Mexico where the governor of New Mexico has given approval for this CIS facility. The local entity that owns the land Eddy-Lea Energy Alliance (ELEA) wants the facility that is set to monitor at least 10,000 dry storage canisters in partnership with Holtec International. The ELEA is composed of cities of Carlsbad and Hobbs and the counties of Eddy and Lea. The community purchased the 1000 acres and has strong local support for the CIS facility. This is the model we must continue

to pursue of the government working with communities to find volunteers who want to help deal with the national crisis of stranded spent nuclear fuel around the country. Earlier this year we hosted officials from ELEA at a CEP meeting, and I was impressed by the level of planning and awareness.

In the densely populated communities around San Onofre, our interest is to advance any responsible program that moves the spent fuel out of our neighborhoods as quickly as possible. For us, that means Yucca and CIS simultaneously. Over the last three years, we have learned three important things about how to pursue this goal.

First, the nation does not benefit from monopolies. To some degree, the problems at Yucca Mountain are the result of the country having just one option. As that option has faltered the whole nation's industry, along with communities around nuclear power plants, have suffered. The original plan, way back when the NWPA was signed into law, was to have two sites. Expedience in public sector spending and noxious politics whittled that roster down to one, and that outcome has been harmful. I am very concerned that the same will happen with CIS. Overall, the nation and the communities that are hosting spent nuclear fuel would benefit from having many options.

Second, and equally important, it is crucial that CIS be viewed as a complement to Yucca Mountain (and to other means of permanent spent fuel disposal—for example, deep borehole technology). I appreciate that over the last year that much of the newfound enthusiasm for acting on spent fuel is rooted in a desire to restart Yucca Mountain. But any realistic scenario for Yucca must deal with the reality that Yucca is still a long time coming. The site is not operational. Once operational, fuel will need repackaging so that casks with large numbers of fuel assemblies are put into smaller units with fewer assemblies and lower heat loads. All that will take time.

For the communities around San Onofre, those realistic delays in starting Yucca create the imperative for CIS. We want the spent fuel moved. For the nation as a whole, those delays offer an important logic for CIS: safety and saving money. It is much wiser to store spent fuel at a small number of large sites, far from population centers, than dozens of sites scattered around the country. Scientists at Oak Ridge National Laboratory have estimated the cost savings from a robust CIS program and found that we could avoid $15-30b in expenditure in light of expected delays in reopening Yucca Mountain.[5] Fiscal prudence demands that CIS be part of the overall strategy.

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[5] For an overview see J. Jarrell "Does Consolidated Interim Storage Make Sense in an Integrated Waste Management System?" Oak Ridge National Laboratory, NEI Used Fuel Management Conference, May 2017, Savannah, GA. Numbers here are undiscounted. For discounting and sensitivity analysis see: Cost Sensitivity Analysis for Consolidated Interim Storage of Spent Fuel: Evaluating the Effect of Economic Environment Parameters (Cumberland et al., FCRD-NFST-2016-000721, Rev. 1 ORNL/SR-2016/681) Available at https://curie.ornl.gov/content/cost-sensitivity-analysis-consolidated-interim-storage-spent-fuel-evaluating-effect-economic

Third, the political coalitions around nuclear power are in flux when it comes to spent fuel. There is a well-known debate about the role of nuclear power in the nation's future energy mix, and active industry efforts to improve performance to keep as many of the existing fleet operational. There are also well-known battle lines drawn for and against nuclear power. What has impressed me about spent fuel is that those battle lines have shifted. Many groups that have been skeptical or outright against operational nuclear plants—such as the Natural Resources Defense Council and the Union of Concerned Scientists—are aligned in favor of finding smart strategies for storing spent fuel, including CIS. It is really important that the larger, heated and probably irreconcilable differences about operational reactors not cloud the fact that many more communities are coming together to find solutions to storing spent fuel.

For Congress, these three lessons suggest that the current efforts—far advanced in the House and still developing in the Senate—to amend the NWPA are profoundly important. As those efforts proceed it is important that the Yucca mission, which has attracted more attention and political energy, not leave CIS aside.

Toward a Long-term Strategy: the Roles of Stewardship and Transportation

Compared with three years ago, there has been striking progress, especially in the House, toward new legislation that would address many of the obstacles to restarting Yucca and also authorizing a new program of consolidated storage. While that is admirable, we also need to grapple with the consequences of a long delay in arriving at this point. It is also crucial to grapple with the fact that most people outside Washington are skeptical that Washington can organize and motivate itself to make practical changes in law and back those with reasonable appropriations. What I have seen in the local communities around San Onofre is concern that Washington is so broken that reasonable bipartisan legislation, such as smart amendments to the NWPA, can't survive the legislative process.

This skepticism has three practical implications. First, while there are some actions that DOE or NRC can do to advance consolidated storage and promote smart stewardship of the nation's spent nuclear fuel, the most important actions require a change in federal law. Getting House (HR 3053) and Senate versions into conference is essential, lest Congress itself be seen as a central obstacle to progress in what has been, so far, largely an Executive Branch failure to deliver on promises made to the American people—especially the people living within the foot prints of nuclear reactors. I have testified at the NRC about their efforts to streamline the regulatory process, which are admirable.[6] But the reality is that the NRC is already doing what it can; even without streamlining of the regulatory process for decommissioned sites those sites

[6] 2014. David G. Victor. Decommissioning at San Onofre: The Community Engagement Experience. Testimony to the Nuclear Regulatory Committee. For more information see https://www.nrc.gov/reading-rm/doc-collections/commission/slides/2014/20140715/victor-20140715.pdf

are finding ways to cope with NRC procedures through exemptions. What everyone is waiting for is enabling federal law.

Second, because of these delays—and skepticism about when they will be resolved—the nation's nuclear sites are now gearing up to monitor and manage spent nuclear fuel casks in ways that were never intended. The original plan was that spent fuel would be removed from reactor cores, cooled in pools onsite, and then put into canisters and casks for brief local storage and expeditious removal. Because that last step in the chain has never happened, the canisters and cask systems are now aging in place. At the urging of the CEP, SCE has developed an extensive program for monitoring the casks and inspecting the canisters while they are on site.[7] Recent legal challenges and settlements have reinforced that effort.[8] We are fortunate in that other sites built dry cask systems before SONGS and we can learn from their aging management programs. To give you a sense of just how long the delays have extended, as of today several sites have seen the original 20 year NRC license for on-site dry cask storage run its course, with each getting a 40-year renewal. At the most recent CEP meeting we devoted the entire session to this topic.[9]

Third is transportation. There is an understandable tendency in Washington to do what can be done. This tendency has generated legislation that focuses on Yucca Mountain and brings CIS along. But we must focus, now, on the reality that all of these strategies will not work unless there are viable ways to move spent fuel from reactor sites to CIS and/or permanent repositories. The US Navy safely ships defense spent nuclear fuel and related materials around the country on a regular basis—thousands of shipments—using an effective and credible government planning system and emergency training for its routes. This system must be available to the DOE as it takes authority over spent nuclear fuel transportation. The NRC has procedures ready for use in this area (NUREG 0725). Safe transportation of spend commercial reactor fuel is not a technical problem, but it is one that needs careful administrative planning and political awareness.

A serious transportation plan would have several elements:

- A program for testing and building railroad cars for moving spent fuel casks. This is a DOE responsibility, and with current appropriations DOE will test a prototype rail car (along with other support cars) over the next 2 years. That's good news, but there are

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[7] 2014. David G. Victor. Safety of long-term storage of spent nuclear fuels at SONGS. Report of the Chairman of the Community Engagement Panel of the SONGS. For more information see https://www.songscommunity.com/docs/LongTermStorageofSpentFuel_120914.pdf

[8] 2017. Citizens Oversight, Inc. V. Southern California Edison. For more information see https://www.songscommunity.com/doc_library_settlement.asp

[9] 2017. 3Q Meeting of the Community Engagement Panel. Oceanside, California. For more information see http://www.songscommunity.com/091417CEPMeetingAgenda.pdf

no appropriations to build a fleet of these cars as will be needed to move spent fuel expeditiously. Elsewhere I have outlined the state of play and costs, which are small. [10]

- The states and regions must get ready. When DOE was planning to move waste from the nuclear weapons sites—such as in Colorado and Washington—state and regional officials got organized to help plan routes, safety and procedures. The states where these sites were shipping nuclear materials had an incentive to make this work because they wanted the sites cleaned up. By contrast, very little to none of the necessary spadework for local, state and regional planning of spent fuel shipments has been done. There is legislation in California that would help.[11] The CEP has reached out to the California Energy Commission on this topic.[12] And the Western Governors Association could easily be tapped—as could regional state associations in other parts of the country. The problem is that nobody has believed that serious solutions for spent nuclear fuel would be forthcoming. Now that they are, the transportation planning processes must gear up—with a key role for the Federal government.

All the authority needed to fix this problem does not rest with Congress but many are looking to Congress for leadership and initiative in getting the process started. A good start would be to ensure that a title on transportation is included in NWPA Amendments (inserted, presumably, in Conference), appropriations to build the needed railcar system are included in a timely way (probably starting next fiscal year), and the states are encouraged if not mandated to get organized. Under plausible yet optimistic scenarios, CIS facilities could be open in the early 2020s. Spent fuel at SONGS (and many other sites) would be ready for shipment then. It would be a pity if all the work done to open storage and permanent disposal facilities falters for lack of attention to transportation.

Final Words

In a large and diverse nation such as ours, there always seems to be a more pressing and urgent matter that captures political attention. Meanwhile, critical questions about the nuclear industry and its infrastructure remain unanswered for decades while leaving un-spent billions of dollars. Inaction has pushing these questions to future generations to answer.

These delays only succeed in creating distrust in the ability of government to find a workable solution, anger towards the plant operators and creates an impossible future for those communities that involuntarily host these sites. All we ask is that those who can act and make a difference, do so with all possible urgency.

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[10] David Victor, Tim Brown and Dan Stetson, "Participants in 12 June telephone call with DOE to discuss transportation of spent nuclear fuel," 26 June 2017, see www.songscommunity.com

[11] 2017. Nuclear Waste Policy Amendments Act of 2017. For more information see https://www.congress.gov/bill/115th-congress/house-bill/3053

[12] Letter from David Victor, Tim Brown and Dan Stetson to Robert Weisenmiller, Chairman of the California Energy Commission, 12 December 2016. see www.songscommunity.com

A plan for smart removal of spent nuclear fuel from the nation's commercial reactors is now coming into focus. It will require new legislation and a new focus by the federal government, as well as the states and regional planning authorities.

I see three steps as essential. First, the political deal must be done that allows for consolidated interim storage, and that deal as far as I can tell centrally requires restarting the Yucca Mountain process. Yucca and CIS should be seen as complements to each other. Politically they are combined; economically and technically they are also combined because interim storage allows for a more rational long-term strategy that includes opening a permanent storage facility. Second, a fresh look at the priorities for removing spent fuel is needed. When options for sending the fuel become viable there will be much more fuel ready to move than the system can handle. We think decommissioned sites should be high in the queue. Third, a viable strategy for transportation is needed—a topic that has been orphaned by the lack of suitable places to send the fuel. Transportation requires some funds (small, mainly for rail cars and planning) and crucially that federal, state and other officials begin working together on strategies.

Mr. FARENTHOLD. Thank you, Mr. Victor.

Dr. Lyman, you've got your 5 minutes, sir.

TESTIMONY OF EDWIN LYMAN

Mr. LYMAN. Thank you, Chairman Farenthold and Acting Ranking Member Raskin and the other distinguished members of the subcommittee. On behalf of the Union of Concerned Scientists, I would like to thank you for the opportunity to testify here today.

And before I begin, I would just like to extend our sympathies and best wishes for a swift and full recovery to the people of Texas, the U.S. Virgin Islands, and all the other areas that have been so deeply affected by Harvey, Irma, and Maria.

UCS has more than half a million supporters united by a central belief we need sound scientific analysis to create a healthy, safe, and sustainable future. We are neither pro nor anti nuclear power, but we have served as a nuclear power safety and security watchdog for nearly 50 years. In this regard, it is critically important that spent fuel be managed safely and protected from terrorist attack until it can be buried in a geological repository. But a sustainable nuclear waste disposal strategy must have broad public acceptance at local, State, and national levels.

The witnesses today were asked to focus on the needs and challenges of communities currently holding nuclear waste. While we do agree these communities must have a major stake in the process, a sound nuclear waste policy should also reflect national priorities and look to protect future generations as well as ours. The problems that actions may appear to benefit some communities in the short term can penalize others and may even be harmful to the long-term interests of the U.S. as a whole.

To be clear, in our view, spent nuclear fuel can be stored safely and securely at reactors and dry cask facilities for many decades, provided that the Nuclear Regulatory Commission, or NRC, conducts rigorous oversight, which has not been the case to date in all respects.

Nevertheless, risk acceptance varies from one community to another, and it is understandable why some representatives would support legislation to facilitate moving spent fuel in their districts out as soon as possible. This is why Congress needs to come together to develop a new and science-based national nuclear waste management policy in order to allocate risks and benefits as fairly as possible.

This policy should include a process to establish and maintain political momentum for development of repositories; a process for repository site selection that is consent-based, fair, and technically sound; requirements that spent fuel be managed safely and securely at reactor sites until a repository becomes available; and requirements for safe and secure shipment of spent fuel from reactor sites to repository. Current laws and regulations do not adequately address any of these issues.

Unfortunately, the one game in town right now, which is H.R. 3053, has a number of flaws and avoids many of these questions, or exacerbates them. We expressed our concerns about it in the draft version earlier this year in testimony. And now if there's a

version that's been reported out, it's a little improved. In some respects it's even worse.

So I'd like to focus on the linkage between siting monitored retrievable storage facilities and a geologic repository. The current version of H.R. 3053 weakens that linkage; in fact, would allow DOE to immediately contract with a private company to spend public funds on developing a monitored retrievable storage facility up until the step of actually operating it. So they could pay to site, do all the reviews, and build a facility, but they can't move fuel there until NRC makes a decision whether or not to authorize construction of a repository at Yucca Mountain.

Now, we can see what the problems with this are. Even with that latter condition, we think this would undermine the geologic repository program, because of the way we read the bill, even if the NRC were to deny a construction authorization for Yucca Mountain, DOE would be allowed to keep building MRS facilities indefinitely, each one capped at 10,000 tons, but could build as many as they wanted. So there would be no impetus for actually going forward with the geological repository. And that, we think, would be a bad outcome primarily because of the security concern of leaving spent fuel aboveground indefinitely.

Over time, spent fuel in aboveground storage is not only a risk—poses a risk for sabotage but eventually will become a risk for nuclear terrorism because of the plutonium contained in the spent fuel. That spent fuel becomes more vulnerable over time because of the decay of the radioactive barrier that protects it. So we do believe there need to be mechanisms to not provide an escape valve that would allow DOE to abandon a search for geologic repositories.

In the meantime, work does need to be done on increasing safety and security of spent fuel at reactor sites. That would include expediting the transfer of spent fuel from pools to dry casks and also upgrading the security requirements for dry cask, because they are also vulnerable.

And finally, transportation is the weakest link in the chain. We agree with the other speakers that this must get more attention than it has in the past to facilitate safe and secure transport of spent fuel in that final management system.

So the U.S. can afford to allow the NRC to take its time reviewing Yucca Mountain because there is a window of safety. But there is no urgent need to rush forward to a less-than-optimal approach. And so Congress should take the time to get it right.

Thank you, and I apologize for exceeding my time.

[Prepared statement of Mr. Lyman follows:]

SUMMARY OF UCS TESTIMONY

- UCS believes that spent fuel can be managed safely at reactor sites for decades, but only if spent fuel is expeditiously transferred from cooling pools to dry casks to reduce the risk of catastrophic spent fuel pool fires, and that the security of dry cask storage is enhanced.

- Congress should not weaken the linkage between monitored retrievable storage (MRS) facilities and geologic repositories established in the Nuclear Waste Policy Act unless it also acts to ensure that MRS facilities do not become de facto permanent repositories.

- Many people believe that nuclear waste disposal is only a political problem, and not a technical problem. In fact, it is both. One should not underestimate the technical challenges of designing and building a repository that will effectively isolate nuclear waste from the environment for hundreds of thousands of years. The foundation of such an effort is good science. One of the most effective ways that Congress could improve the prospects for a geologic repository is to fully support the scientific work needed to establish the technical basis for its safety and security.

Good afternoon. On behalf of the Union of Concerned Scientists, I would like to thank Chairman Farenthold, Ranking Member Plaskett, and the other distinguished members of the Subcommittee for the opportunity to provide our views on nuclear waste management and disposal policy in the United States.

Before I begin, I would like to extend our sympathies and best wishes for a swift and full recovery to the people of Texas, the U.S. Virgin Islands, and all the other areas that have been so deeply affected by Hurricanes Harvey, Irma and Maria.

The Union of Concerned Scientists (UCS) has more than half a million supporters, united by a central belief: that we need sound scientific analysis to create a healthy, safe, and sustainable future. UCS is neither pro- nor anti-nuclear power, but has served as a nuclear power safety and security watchdog for nearly fifty years. Combating the threat of global climate change is one of our priorities, and we have not ruled out an expansion of nuclear power as an option to help reduce greenhouse gas emissions—provided it is affordable relative to other low-carbon options and that it meets high safety and security standards. These considerations apply as well to the management and disposal of spent nuclear fuel, which contains long-lived, highly radioactive fission products and weapon-usable plutonium. It is critically important that spent fuel be managed safely and protected from terrorist attack until it can be buried in a geologic repository. But a sustainable nuclear waste disposal strategy must also have broad public acceptance at local, state, and national levels.

The witnesses today were asked to focus on the needs and challenges of communities currently holding nuclear waste. While we agree that those communities must have a major stake in the process, we believe that a sound nuclear waste policy should also reflect national priorities and look to protect future generations as well as ours. The problem is that actions that may appear to benefit some communities in the short term can penalize others, and may even be harmful to the long-term interests of the U.S. population as a whole.

To be clear, in our view, spent nuclear fuel can be stored safely and securely at reactors in dry cask facilities for many decades, provided that the Nuclear Regulatory Commission (NRC) conducts rigorous oversight. Nevertheless, risk acceptance varies from one community to another, and it is understandable why some elected representatives would support legislation that would expedite the shipment of spent nuclear fuel out of their districts or states. This is why Congress needs to come together to develop a new and science-based national nuclear waste management and disposal policy—one that allocates risks and benefits as fairly as possible.

The main elements of such a policy should include (1) a process to establish and maintain political momentum for development of geologic repositories; (2) a process for repository site selection and approval that is consent-based, fair and technically sound; (3) requirements that spent nuclear fuel will be managed safely and securely at reactor sites until a repository becomes available; and (4) requirements for the safe and secure shipment of spent nuclear fuel from reactor sites to a final repository. Current laws and regulations do not adequately address any of these issues.

Unfortunately, the House Energy and Commerce Committee, by voting in June of this year to report out the flawed H.R. 3053, the Nuclear Waste Policy Amendments Act of 2017, appears determined to avoid confronting these questions. UCS expressed our concerns about a draft version of this bill earlier this year in testimony before an Energy and Commerce subcommittee. We disagreed with the draft bill's limited scope, its weakening of the linkage between monitored retrievable storage facilities and geologic repositories, and its Yucca Mountain-centric approach. The amended bill reported out of committee was little improved, and in some respects is even worse than the original.

Establishing and Maintaining Momentum for Repository Siting

The first version of H.R. 3053 weakened the critical linkage between the DOE's authority to store nuclear waste at consolidated monitored retrievable storage (MRS) facilities and the

development of a geologic repository, as established by the 1982 Nuclear Waste Policy Act (NWPA). The bill as amended has further weakened this linkage.

The NWPA rightly imposed tight constraints on MRS facilities because of the concern that sending nuclear waste to interim storage facilities away from reactors could derail political efforts to develop geologic repositories and result in the interim facilities becoming de facto permanent disposal sites.

The NWPA currently prevents the DOE from constructing an MRS facility until the NRC has issued a construction license for a geologic repository. H.R. 3053 would sever this linkage by allowing the DOE to immediately contract with a private company to develop an MRS, provided that state and local governments consent. This means that the DOE could use public money to pay for MRS siting, environmental reviews, licensing, permitting, site preparation, development of transportation links, and construction: all activities short of operation. However, the DOE would not be allowed to store nuclear waste it owns at such a facility until after the Nuclear Regulatory Commission (NRC) decides whether or not to authorize construction of a repository at Yucca Mountain (or declares that such a decision is "imminent").

Even with the latter condition, we believe this MRS authorization would likely undermine the geologic repository program. If the NRC denies a construction authorization for Yucca Mountain, H.R. 3053 would not require the DOE to search for another geologic repository site, and would allow it to store nuclear waste in MRS facilities indefinitely. The quantity of nuclear waste at each MRS would remain capped at 10,000 metric tons. But if the NRC were to reject Yucca Mountain, we read the bill as then allowing the DOE to build as many MRS facilities and enter into as many MRS agreements as needed (and contingent on funding).

We also note that even if the NRC were to approve Yucca Mountain, H.R. 3053 would allow for consolidated interim storage of a large and possibly unlimited quantity of nuclear waste for an indefinite period. The bill would raise the statutory cap for Yucca Mountain from 70,000 to 110,000 metric tons of nuclear waste. While this seems like a pragmatic change, given that the United States has already accumulated well over 70,000 metric tons of nuclear waste, raising the

cap would further postpone the need to find a second repository site. Moreover, in this case as well, the MRS provision in H.R. 3053 would authorize the DOE to build as many MRS facilities as needed, eliminating the need to site a second repository at all. In either case, the outcome would be dangerous for both environmental and security reasons.

Why is there a security concern? First, an MRS facility is vulnerable to sabotage attacks that could lead to dispersal of radioactive materials. Second, spent fuel in retrievable storage will eventually become an attractive material for terrorists seeking to obtain nuclear weapons. Spent fuel contains plutonium which can be extracted by reprocessing. However, for many decades after removal from a reactor, spent fuel is highly radioactive and very difficult for terrorists to steal and reprocess. But as the fission product cesium-137 decays away over time and the spent fuel becomes less radioactive, the plutonium it contains will become more accessible.

Under the NRC's rules, when the level of radioactivity from spent fuel drops below a certain threshold (100 rem per hour at 3 feet), physical protection measures for spent fuel would have to be increased to the same strict standard that applies to separated plutonium. This would require a significant security upgrade for spent fuel in retrievable storage. Some commercial spent fuel will reach this point as soon as seventy years after being removed from the reactor. This is one reason why the nation must focus on the goal of building a geologic repository for spent fuel and making it irretrievable as soon as it is safe to do so. Once spent fuel is sealed within a deep underground facility, it will be much harder for terrorists to access.

We also note that even from the point of view of an MRS supporter, the promises offered by H.R. 3053 ring hollow. By allowing the DOE to contract for the construction of an MRS immediately but preventing the facility from operating until the NRC has made a final Yucca Mountain decision, the government could spend hundreds of millions of dollars in the near term on a facility that may not be used for many years, if ever. While H.R. 3053 also requires the NRC to make a final decision on Yucca Mountain within 30 months after its passage, it cannot enforce this mandate. After all, under the NWPA the NRC was required to make its decision no

later than October 2012. That didn't happen because the DOE stopped supporting its Yucca Mountain license application in 2010. Given past experience, there is no guarantee that future administrations will adhere to a pro-Yucca policy.

In addition, a recent GAO study outlined the formidable hurdles that would have to be overcome if the DOE decided to reactivate its Yucca license application.[1] There are nearly three hundred technical contentions that would have to be adjudicated before the NRC Atomic Safety and Licensing Board. However, the GAO noted that the DOE will need time to reconstitute a team of experts who can defend the application at the NRC. Although the GAO report is careful not to give its own estimate of how long the licensing process would actually take to complete, the report cites an NRC estimate from 2014 of 5 years to resume and complete the adjudication. Given my own experience with NRC adjudications, a period of 30 months, or anything close to it, does not seem realistic.

To address the possibility that the NRC may ultimately reject Yucca Mountain or never come to a final decision, a comprehensive nuclear waste management bill should contain mechanisms to ensure that DOE will not abandon searching for alternative repository sites. Congress should restore linkages between MRS facilities and geologic repositories, perhaps including a limit on the time that nuclear waste can be stored in any MRS facility and a limit on the combined capacity of all MRS facilities.

A More Equitable and Science-Based Repository Siting Process

UCS strongly supports the development of geologic repositories for direct disposal of spent fuel. However, we do not have the geological expertise on staff to assess the technical suitability of the Yucca Mountain site, or for that matter, any other potential site in the United States. With regard to political suitability, we concur with the assessment of the Blue Ribbon Commission Report that the process by which Yucca Mountain was selected was flawed and contributed to

[1] Government Accountability Office (GAO), "Commercial Nuclear Waste: Resuming Licensing of the Yucca Mountain Repository Would Require Rebuilding Capacity at DOE and NRC, Among Other Key Steps," GAO-17-340, April 2017.

the erosion of trust in the program that caused it to stall. Congress should pursue a different and less adversarial approach that will be more likely to lead to selection of sites that are both technically suitable and publicly acceptable. Once a process is in place, Yucca Mountain could then compete with other repository proposals on a level playing field.

In order to increase the likelihood of success, Congress needs to find an approach for repository siting that could facilitate local and regional cooperation, rather than heighten already entrenched opposition. However, H.R. 3053 goes in the wrong direction with a heavy-handed attempt by the federal government to resolve disputes by preempting state authority instead of promoting dialogue and cooperation. The state of Nevada, predictably, opposes the bill. While it may be unrealistic to hope for an all-inclusive "consent-based" siting approach, as first proposed by the 2012 report of the Blue Ribbon Commission on America's Nuclear Future (BRC), there is surely a way to develop a process that at least is perceived by all stakeholders as fair, even though they might not all agree with the outcome.

Many people believe that nuclear waste disposal is only a political problem, and not a technical problem. In fact, it is both. One should not underestimate the technical challenges of designing and building a repository that will effectively isolate nuclear waste from the environment for hundreds of thousands of years. The foundation of such an effort is good science. One of the most effective ways that Congress could improve the prospects for a geologic repository is to fully support the scientific work needed to establish the technical basis for its safety and security.

Safety and Security of Spent Fuel Storage at Reactor Sites

A comprehensive strategy for nuclear waste management must also address the safety and security of spent fuel storage at reactor sites. Even if Yucca Mountain were to receive a license tomorrow, constructing the repository and transportation infrastructure would take time, and large quantities of spent fuel would likely remain at many reactors for decades to come. Also, for operating reactors, there will be a need to store recently discharged spent fuel on site.

Unfortunately, the NRC allows spent fuel to be stored in dangerously overloaded spent fuel pools, which exposes millions of Americans to needless risk.[2] If an earthquake or a terrorist attack were to damage a spent fuel pool at a U.S. reactor, causing it to rapidly lose its cooling water, the spent fuel could heat up and burn, releasing a large fraction of its highly radioactive contents into the environment. The consequences of such an event would be truly disastrous. A recent Princeton University study calculated, using sophisticated computer models, that a spent fuel pool fire at the Peach Bottom nuclear plant in Pennsylvania could heavily contaminate over 30,000 square miles with long-lived radioactivity and require the long- term relocation of nearly 20 million people, for average weather conditions. Depending on the wind direction and other factors, the plume could reach anywhere from Maine to Georgia. The impact on the American economy would be profound, and likely far worse than the estimated $200 billion in damages caused by the much smaller release of radioactivity from the damaged Fukushima Daiichi plant, or the estimated $180 billion in damages resulting from Hurricane Harvey's devastation.

The consequences of a terrorist attack or earthquake would be greatly reduced if nuclear plants thinned out their spent fuel pools by transferring the older fuel to dry storage casks. Yet the NRC has refused to require nuclear plants to do so, insisting in the face of all evidence that the risk is tolerable. And the industry will not voluntarily spend the money to buy additional dry casks, despite their modest cost in relation to the potential economic damages from a pool fire.

To this end, we urge Congress, as part of any nuclear waste management reform package, to address the unacceptably high risk of a spent fuel pool fire by either requiring nuclear plants to thin out their densely packed spent fuel pools by expediting transfer to dry cask storage, or by creating strong incentives for nuclear plants to do so on their own, such as a reduction in future Nuclear Waste Fee assessments. This requirement would have a valuable side benefit by adding good jobs in the dry cask storage construction industry.

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[2] E. Lyman, M. Schoeppner and F. von Hippel, "Nuclear Safety Regulation in the Post-Fukushima Era," *Science*, May 26, 2017.

While the risk of a large radiological release is greatly reduced when spent fuel is moved from high-density pools to dry casks, it does not go down to zero. One must also be concerned about sabotage attacks on dry storage casks. Indeed, during security reviews that it ordered following the 9/11 attacks, the NRC discovered ways to sabotage dry storage casks that could cause significant radiological releases. Accordingly, it began developing new requirements for protecting dry cask storage facilities—both at reactor sites and at centralized sites—from sabotage. However, in 2015 the NRC delayed development of these new requirements for at least five years, citing resource constraints. Any new nuclear waste legislation should contain provisions to ensure that these vulnerabilities are promptly addressed.

Safety and Security of Spent Nuclear Fuel Transportation

In nearly any future system for spent nuclear fuel management, large quantities of spent nuclear fuel will need to be shipped long distances by road, rail, and waterway. Plans for ensuring that the public and the environment will be protected during such transportation are simply not adequate. Safety standards for nuclear waste transportation have changed little over the decades despite major evolutions in the nation's transportation system, such as highway speed limit increases. In the early 2000s, the NRC planned to carry out a study to evaluate whether the safety requirements for nuclear waste casks provided sufficient levels of protection, but the project was never carried out. Congress should mandate that the NRC resume this study, and provide sufficient funding for it.

Security of spent fuel during transport is also a great concern. Transportation is the weakest link in the security chain. Shipping casks may be vulnerable to the same types of attack modes as dry storage casks (and in fact some casks are designed for both transport and storage). Yet the NRC has no requirements to harden shipping casks to resist such attacks. Congress should require that the NRC shipping cask study consider these issues and whether new security standards are needed.

The United States can afford to allow the NRC to take its time in reviewing the safety of Yucca Mountain and for the DOE to locate and characterize other possible repository sites. Provided that nuclear plants thin out their high-density spent fuel pools by expediting transfer to dry casks, and other necessary upgrades are carried out, spent fuel can be stored safely and securely at reactor sites for many decades. There is no urgent need to rush forward with a less-than-optimal approach for the long term.

Thank you for your attention. I would be happy to answer your questions.

Mr. FARENTHOLD. Oh, that's all right. No, you didn't go too badly. We had somebody this morning use 5 extra minutes.

Ms. Tubb, you're up. And please don't use 5 extra minutes.

TESTIMONY OF KATIE TUBB

Ms. TUBB. My name is Katie Tubb, and I'm a policy analyst for energy and environment issues at the Heritage Foundation. And the views I express today are my own. Thank you for the opportunity to testify before you today and for your interest in examining nuclear waste management issues.

Rather than a problem, I believe nuclear waste management is an opportunity for growth and innovation in the nuclear industry, if we can get policy right. As requested, I hope to briefly cover how we got to the current dysfunction, the consequences of stalled action, particularly to taxpayers, and where we are on the issue today.

According to the Nuclear Waste Policy Act of 1982, as amended, the Department of Energy entered into contracts with commercial nuclear power companies to collect and store nuclear waste at a long-term repository at Yucca Mountain. It was required to begin collecting waste by 1998.

In 2008, the DOE applied for a license with the NRC to build a facility at Yucca Mountain. But shortly thereafter, and lacking any technical or scientific justification, the Obama administration unilaterally walked away from the Yucca Mountain license and declared it not a workable solution.

Following a series of court cases, the NRC was ordered to review the Yucca Mountain application until funds were exhausted, and the DOE was required to stop collection of the nuclear waste fee. These pivotal court decisions, in essence, bring matters back to where they were in 2008.

Stalled action has had costs, and a voice too often left out is that of the taxpayer. Because the DOE has failed to collect nuclear waste as contractually obligated, it has been found in partial breach of its contracts with nuclear power companies. Over $6 billion in settlements have been paid to nuclear utilities from the Treasury Department's Judgment Fund. And put simply, this means the DOE budget takes no hit for its negligence. The nuclear industry is made whole through the Judgment Fund. Taxpayers cover the bill.

The DOE projects liability to be $24.7 billion, based on DOE's 2016 December financial report. But this is misleading because it assumes construction of a pilot interim facility in 2021 based on the Obama administration's original plan. The nuclear industry estimates liability of upwards of $50 billion.

Another expense to taxpayers is a result of how the Nuclear Waste Fund is accounted for in Federal budgets. As mentioned, the DOE stopped collecting the nuclear waste fee in May 2014 as the courts directed. However, CBO continues to assume the Federal Government is collecting $385 million simply because the DOE could continue—or reinstate the fee. OMB has also used this budget tool. In other words, the Nuclear Waste Fund has been used to disguise the cost of budgeting choices, perpetuating the myth that Congress is fully paying for new spending.

The current and future nuclear industry faces considerable uncertainty after the past decade of political mismanagement. Despite a new administration willing to follow the law, Congress has not appropriated for the Nuclear Waste Fund since 2010. American is at a crossroads where Congress has the opportunity to set nuclear waste management on track. There have been notable legislative efforts; however, none have addressed the underlying issues with the current system.

First, responsibility for nuclear waste management ought to belong with nuclear power operators as an aspect of commercial nuclear power generation in the same way that other industries such as healthcare, mining, manufacturing, farming all take care of their own waste streams.

If waste management were a dynamic part of the utility's bottom line, the nuclear industry would naturally be interested not only in efficient nuclear waste disposal, but also cost-effective predisposal decisions such as interim storage options, fuel types, and reactor technologies.

When nuclear power companies are responsible for waste management, regulatory agencies can been seen exactly as that: Disinterested regulatory agencies interested in protecting health and safety. As both regulatory and repository operator, the government appears to have a bias, whether that's real or just perceived.

Further, a potential host community can then be a truly equal partner in negotiations with the industry, rather than an inferior party submitting to the Federal Government in a David-Goliath battle to locate a repository.

Secondly, nuclear waste policy reforms should replace the previous flat nuclear waste fee with accurate pricing. Prices are critical to any functional and efficient marketplace and provide suppliers and customers with data to determine the attractiveness of a product and service. Prices also give potential competitors the information they need to introduce new alternatives.

Nuclear waste management is not an inherent government activity. It is primarily a business activity related to commercial production of electricity. Reform must work off of these two principles of industry responsibility and market prices. It also must recognize that a long-term geologic repository is needed and that in order to progress with the Yucca Mountain, the State of Nevada must have more say in the matter.

I think a possible way forward is to treat existing waste under the political realities of the Nuclear Waste Policy Act and to approach new ways under a market-based policy. At the very least, Congress needs to provide enough funding for the DOE and NRC to complete the license review of Yucca Mountain. Finishing the review merely brings all the information together for Congress, Nevada, and the industry to make prudent decisions about the next steps.

Thank you for giving me 38 extra seconds.

[Prepared statement of Ms. Tubb follows:]

CONGRESSIONAL TESTIMONY

Examining America's Nuclear Waste Management and Storage

Testimony before
Subcommittee on the Interior, Energy, and Environment

Committee on Oversight and Government Reform

United States House of Representatives

September 26, 2017

Katie Tubb
The Heritage Foundation

Thank you for the opportunity to testify before you today and for your interest in examining nuclear waste management issues. While managing nuclear waste has been a source of much heated debate, false starts, and exasperation, it is a solvable challenge. Rather than a problem, I believe nuclear waste management has the potential to be an opportunity for growth and innovation in the nuclear industry.

As requested, this testimony covers how America got to the current dysfunction in nuclear waste management policy, the consequences of stalled action particularly to taxpayers, and where we are now on the issue including principles I believe will get nuclear waste management on track.

How We Got Here

According to the Nuclear Waste Policy Act of 1982, the Department of Energy (DOE) entered into contracts with commercial nuclear power companies to collect and store nuclear waste. After evaluating alternative sites, Congress amended the Act in 1987 to designate Yucca Mountain as the site for a national repository should the Nuclear Regulatory Commission (NRC) approve a license. This and the DOE's failure to collect nuclear waste or license a repository have been the major touchpoints for contention. Despite nearly 60 years of nuclear power generation the DOE has yet to begin collecting waste, though it was required to begin doing so by 1998.

A nuclear waste fund was designed under the Act to ensure that the entire costs of nuclear waste disposal were borne by the nuclear industry and their ratepayers. Appropriately, it is nuclear power operators and ratepayers, not federal taxpayers, who cover the costs of managing waste from

electricity production and use.[1] This is done through a fee on nuclear power generation, which while being collected by the DOE accumulated roughly $750 million annually. Congress would then appropriate from the nuclear waste fund as a means of protecting both taxpayers from subsidizing nuclear waste management and providing accountability over the DOE's use of funds.

In 2008, the DOE applied for a license with the NRC to build a facility at Yucca Mountain because the site "brings together the location, natural barriers, and design elements most likely to protect the health and safety of the public, including those Americans living in the immediate vicinity, now and long into the future."[2]

Despite the clear direction of the Nuclear Waste Policy Act as amended, and lacking any technical or scientific justification, the Obama Administration unilaterally decided that Yucca Mountain was "not a workable option," and attempted to withdraw the license application.[3] The Obama Administration disbanded the Office of Civilian Radioactive Waste Management (OCRWM) responsible within the DOE for the license, and refused to use funds as appropriated by Congress from the nuclear waste fund to advance the DOE's application. Nevertheless, the Administration attempted to continue collecting the fee on nuclear operators while advancing its own strategy.[4]

Following a series of court cases, the NRC was ordered to finish reviewing the Yucca Mountain application while funds existed or until Congress directed otherwise,[5] and the DOE was required to stop collection of the nuclear waste fee.[6] The nuclear waste fund currently holds $38.8 billion in industry fees and accumulated interest; interest amounts to roughly $1.4 billion annually.[7] To put this in perspective, the House of Representatives requested an initial $120 million for the DOE and the NRC to continue the Yucca Mountain licensing process. The last collection to the nuclear waste fund was made in May 2014.

These pivotal court decisions in essence bring matters back to where they were in 2008, when the DOE first applied for a license. The NRC technical staff finished its safety evaluation report of the DOE application in January 2015 and concluded that a repository at Yucca Mountain would be technologically feasible and safe. However, contentions with the license application remain to be heard before the licensing board and there must be a licensable entity within the DOE for the NRC

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[1] See section 111(b)(4) and again Sec. 302(a)(4) of the Nuclear Waste Policy Act.

[2] U.S. Department of Energy, "Recommendation by the Secretary of Energy Regarding the Suitability of the Yucca Mountain Site for a Repository Under the Nuclear Waste Policy Act of 1982," February 2002, http://energy.gov/sites/prod/files/edg/media/Secretary_s_Recommendation_Report.pdf (accessed September 22, 2017).

[3] U.S. Department of Energy, Steven Chu, Secretary of Energy, "Statement of Steven Chu Secretary of Energy Before the Committee on the Budget," U.S. Senate, Washington, DC, March 11, 2009, http://energy.gov/articles/statement-steven-chu-secretary-energy-committee-budget (accessed September 21, 2017).

[4] The Obama Administration pursued a number of "fact finding missions" and alternatives excluding Yucca Mountain, among them its Blue Ribbon Commission, the ***Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste***, consent-based siting, and deep boreholes.

[5] Katie Tubb, "Court Kicks Yucca Mountain Review Back in Motion," The Daily Signal, August 13, 2013, http://dailysignal.com/2013/08/13/court-kicks-yucca-mountain-review-back-in-motion/.

[6] Katie Tubb, "DOE Can't Collect Fees for Not Managing Nuclear Waste," Daily Signal, May 16, 2014, http://www.heritage.org/energy-economics/commentary/doe-cant-collect-fees-not-managing-nuclear-waste.

[7] U.S. Department of Energy, "Audit Report: Department of Energy Nuclear Waste Fund's Fiscal Year 2016 Financial Statement Audit," Office of Inspector General, December 2016, pp. 5, 10, https://energy.gov/sites/prod/files/2016/12/f34/OAI-FS-17-04.pdf (accessed September 21, 2017).

to evaluate. This presumably would be the statutorily required Office of Civilian Radioactive Waste Management.

Costs of Inaction to Taxpayers

Stalled action has had costs. The nuclear industry and local communities offer important perspectives. However, a voice too often left out is that of the taxpayer.

Because the DOE has failed to collect nuclear waste as contractually obligated, it has been found in partial breach of its contracts with nuclear power companies. Today, the federal government remains liable for over 76,000 tons of commercial nuclear waste.[8] This liability grows as America's nuclear power reactors produce roughly 2,000 tons of nuclear waste every year as part of providing nearly 20 percent of the electricity used in the US.

According to the DOE's most recent count, $6.1B in settlements have been paid to nuclear utilities. Another $161.5M will be paid in 2017.[9] This money comes from the Treasury Department's Judgement Fund as a "permanent, indefinite appropriation."[10] Put simply, the DOE budget takes no hit for its negligence and the nuclear industry is "made whole" through the Judgement Fund. Taxpayers are left to cover the bill.

The DOE projects future liability to be $24.7 billion, but this is misleading because it assumes construction of a pilot interim storage facility by 2021 as previously called for by the Obama Administration without the approval of Congress.[11] The nuclear industry estimates at least $50 billion in liabilities.

Another expense to taxpayers is as a result of how the nuclear waste fund is accounted for in federal budgets. As mentioned earlier, the DOE stopped collecting fees from industry for the nuclear waste fund in May 2014 as directed by the courts. However, the Congressional Budget Office continues to assume the government is bringing in $385 million annually simply because the DOE *could* reinstate the fee.[12] The Office of Management and Budget has also used this accounting trick in its budgets.[13]

No such money has been collected, yet Congress uses this assumption to offset $385 million in increased federal spending. In other words, the nuclear waste fund has been used by Congress to

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[8] Nuclear Energy Institute, "On-Site Storage of Nuclear Waste," https://www.nei.org/Knowledge-Center/Nuclear-Statistics/On-Site-Storage-of-Nuclear-Waste (accessed September 21, 2017).
[9] U.S. Department of Energy, "Fiscal Year 2016 Agency Financial Report," November 15, 2016, pp. 82-83, https://www.energy.gov/cfo/downloads/fy-2016-doe-agency-financial-report (accessed September 21, 2017).
[10] Bureau of the Fiscal Service, "Judgment Fund," U.S. Department of the Treasury, https://www.fiscal.treasury.gov/fsservices/gov/pmt/jdgFund/judgementFund_home.htm (accessed September 22, 2017).
[11] DOE, "Fiscal Year 2016 Agency Financial Report," pp. 82-83.
[12] $385 million is roughly half of the $750 million per year the DOE collected from nuclear power plants while the fee was in place. Kim Cawley, "The Federal Government's Responsibilities and Liabilities Under the Nuclear Waste Policy Act," testimony before the Subcommittee on Environment and the Economy, Energy and Commerce Committee, U.S. House of Representatives, December 3, 2015, https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51035-NuclearWaste_Testimony.pdf (accessed September 21, 2017).
[13] See for example, Office of Management and Budget, *Budget of the U.S. Government, Fiscal Year 2017*, February 9, 2016, p. 130 https://obamawhitehouse.archives.gov/sites/default/files/omb/budget/fy2017/assets/budget.pdf (accessed September 21, 2017).

disguise the cost of budgeting choices, "perpetuating the myth that Congress is fully paying for new…spending."[14]

Finally, stalled action on nuclear waste management is contributing pressure to clean up of radioactive waste from Cold War and WWII weapons sites under DOE's Environmental Management (EM) portfolio. Without a long term repository for nuclear waste, many of these sites cannot complete cleanup. The DOE estimates total taxpayer liability for the EM mission to be $371.7 billion.[15] This is necessary work and an appropriate function of the federal government to tackle cleanup of these sites. However the lack of a final repository for defense related waste certainly factors into and puts undue pressure on this liability.

Where We Are Now: Appropriations Deadlock

The current and future nuclear industry faces considerable uncertainty after the past decade of political mismanagement. Despite a new administration willing to follow the law Congress has not appropriated from the nuclear waste fund since 2010. Congress's failure to appropriate funds to complete the Yucca Mountain permitting process only prolongs the DOE's failure to collect nuclear waste.

Far from the intent of protecting the fund's use from political whims, appropriations from the nuclear waste fund have become a principle lever for impacting nuclear waste management policy. Further, changes in federal budgeting rules over time also have unduly complicated use of the nuclear waste fund, thwarted reform of nuclear waste management, and enabled abuse by Congress and presidential administrations to disguise federal spending. Given the division of the nuclear waste fund between mandatory receipts and discretionary appropriations, Congress faces considerable barriers to use or reform the fund and therefore to make any progress on nuclear waste management policy, let alone progress on a repository at Yucca Mountain.

As stated aptly by former longtime Office of Management and Budget analyst Joseph Hezir, "The actual experience with implementation of the [nuclear waste fund] has been virtually opposite of the original Congressional intent."[16]

Congress currently appears to be in a deadlock. Senate leadership seems unwilling to appropriate from the nuclear waste fund to complete the Yucca Mountain license process in an election year but is interested in DOE interim storage options.[17] The House has routinely appropriated funding for Yucca Mountain and wisely has not pursued interim storage without commensurate progress on the Yucca Mountain licensing process.

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[14] Justin Bogie, "Budget Gimmicks Increase Federal Spending and Mask True Costs of Legislation," Heritage Foundation *Backgrounder* No. 3234, July 26, 2017, http://www.heritage.org/budget-and-spending/report/budget-gimmicks-increase-federal-spending-and-mask-true-costs.

[15] DOE, "Fiscal Year 2016 Agency Financial Report," p. 72.

[16] Joseph Hezir, "Budget and Financial Management Improvements to the Nuclear Waste Fund (NWF)," Background Report to the Blue Ribbon Commission, May 2011, https://curie.ornl.gov/system/files/documents/not%20yet%20assigned/brc_hezir_nwfbudget_051511.pdf (accessed September 22, 2017).

[17] Dan Leone, "Simpson Tags Senate Leadership for Yucca Holdup," Exchange Monitor, September 15, 2017, http://www.exchangemonitor.com/publication/rwm/simpson-tags-senate-leadership-yucca-holdup/?printmode=1 (accessed September 22, 2017).

Next Steps for Nuclear Waste Management Policy

America is at a crossroads where Congress has an opportunity to set nuclear waste management on track. There have been some notable legislative efforts to make progress and at least a dozen attempts since 1984 to fix the nuclear waste fund alone.[18] From these attempts, at least two cautionary tales surface.

First, so long as nuclear waste management remains a function of the government, Congressional accountability through appropriations is absolutely necessary. Congress's power of the purse should not be legislated away. Oversight through appropriations is necessary in order to protect both ratepayers and taxpayers with all the necessary checks and balances of a democratic government.

Granted, keeping nuclear waste management as a publically-managed, congressionally appropriated activity has challenges. This was known almost from the start with the Nuclear Waste Policy Act's passage. As Thomas Cotton of the now defunct Congressional Office of Technology Assessment then testified:

> "In short, it appears to us that there is an inherent conflict between a stable commitment to a long term fixed schedule for a complex technical project such as waste disposal on the one hand, and a high degree of external annual budgetary control on the other.
>
> ...striking a balance between the independence that appears to be needed to ensure steady and predictable progress towards timely achievement of a longterm goal, and the degree of oversight and control required in a democratic society, may be one of the most difficult challenges involved in devising a comprehensive waste management program."[19]

This is all the more reason why nuclear waste management policy in the US must be re-imagined altogether.

Secondly, recent legislative attempts to fix nuclear waste management policy have emphasized the option of interim storage. Regardless of what happens with Yucca Mountain, the scientific community and global experience have supported deep geologic storage as critical to any waste management plan. Interim storage, by itself and under the current policy is settling for the bare minimum requirements to alleviate the government's liability for commercial nuclear waste. This stop-gap measure would eliminate a powerful incentive for the government to make good on its long-delayed promise to manage and dispose of the nuclear waste it is legally responsible for under the Nuclear Waste Policy Act. And it would dampen incentive to install the greater policy reforms necessary for nuclear waste management.

Most operating and decommissioned nuclear power plants are currently functioning as what the NRC calls Independent Spent Fuel Storage Installations (ISFSI). As commonly designed in the U.S., an interim storage facility is little more glamorous than an expensive concrete pad for large concrete encased casks of spent nuclear fuel or keeping fuel in existing pools for longer than planned.[20] The

[18] See appendix A of Hezir, "Budget and Financial Management Improvements."
[19] As quoted in Hezir, "Budget and Financial Management Improvements," p.32.
[20] U.S. Nuclear Regulatory Commission, "Typical Dry Cask Storage System," April 13, 2015, http://www.nrc.gov/waste/spent-fuel-storage/diagram-typical-dry-cask-system.html (accessed September 22, 2017).

NRC has determined,[21] and the DOE itself recognizes, that "nuclear waste is safe and secure in these locations."[22] In other words, the U.S. already *has* an interim storage system which the NRC has determined is secure.

However, the biggest hurdle to a long-term storage facility and robust nuclear industry is that the federal government, per the 1982 Nuclear Waste Policy Act, is responsible for managing and disposing of the nuclear waste produced by private businesses. Legislative efforts have not addressed the underlying problems of the current system connected to this – namely, that nuclear power plants are not responsible for waste management, and that there is no meaningful pricing system.[23]

First, responsibility for nuclear waste management ought to belong with nuclear power operators as an aspect of producing commercial power, in the same way that other industries, such as health care, mining, farming, or manufacturing, are responsible for managing their own wastes. If waste management were a dynamic part of a utility's bottom line, the nuclear industry would naturally be interested not only in efficient nuclear waste disposal, but also in cost-effective pre-disposal choices, such as interim storage options, fuel types, and reactor technology.

Making industry responsible for the nuclear waste they produce does not remove the government's role altogether, as it is appropriately responsible for regulations protecting health and safety and taking final title to waste and a decommissioned repository.

When nuclear power companies are responsible for waste management, regulating agencies can then be seen as simply that—regulators with a disinterested goal of protecting health and safety. But as both a regulator and repository operator, the government appears to have a bias.

In this situation, a potential host community can then be a truly equal partner in negotiations with industry rather than an inferior party submitting to a federal government's will to locate a repository in a David and Goliath battle. Former Governor Mike Sullivan's reflections on the consideration of an interim storage site in Wyoming are telling. Governor Sullivan ultimately vetoed the proposed interim storage facility because "it was a federally controlled process of a serious issue [and] it seemed to me we would rapidly lose control…I wasn't sure we could trust the federal government to do what they said they were going to do, and if we stepped into this we'd be dancing with a 900 pound gorilla, and I didn't think that was in the interests of the state."[24]

In contrast, a system with appropriately assigned waste management responsibilities for both industry and government is not just a theoretical ideal but is being accomplished in Finland. Finland

[21] U.S. Nuclear Regulatory Commission, "Continued Storage of Spent Nuclear Fuel," July 25, 2015, http://www.nrc.gov/waste/spent-fuel-storage/wcd.html (accessed September 22, 2017).
[22] Franklin Orr, "Finding Long-Term Solutions for Nuclear Waste," U.S. Department of Energy, December 21, 2015, http://www.energy.gov/articles/finding-long-term-solutions-nuclear-waste(accessed September 22, 2017).
[23] Katie Tubb and Jack Spencer, "Real Consent for Nuclear Waste Management Starts with a Free Market," Heritage Foundation, *Backgrounder* No. 3107, March 22, 2016, http://www.heritage.org/environment/report/real-consent-nuclear-waste-management-starts-free-market.
[24] Greg Fladager, "Nuclear Plan in Wyoming? Committees Pass Bill for Legislation Consideration," *Casper Journal*, November 5, 2012, http://casperjournal.com/business/article_c0d78ba3-73ab-5dc7-9521-cb5a0f5da685.html (accessed September 22, 2017).

provides a particularly instructive example because the community housing a long-term repository was originally overwhelmingly opposed to a facility.[25]

Secondly, nuclear waste policy reform should replace the previous flat fee to the nuclear waste fund with accurate pricing. Prices are critical to any functional and efficient marketplace and provide suppliers and customers with data to determine the attractiveness of a product or service. Prices also give potential competitors the information they need to introduce new alternatives that meet unique operator and community needs. Nuclear utilities would then have incentives to consider new technology and fuel types tied to their waste management decisions.

Nuclear waste management is not an inherently governmental activity.[26] It is a primarily business activity related to the commercial production of electricity. Until market forces are introduced into waste management in America, solutions will at best be prolonged in unrelated political battles and narrow in focus rather than an innovative part of the nuclear industry.

Reform must work off of these two principles of industry responsibility and market prices. It must also recognize that a long-term geologic repository is needed, and that in order to progress with Yucca Mountain the state of Nevada must have more say in the matter.

Moving forward, a possible way out of the nuclear waste management and Yucca Mountain conundrum is to treat existing waste under the political realities of decisions made by Congress under the Nuclear Waste Policy Act, and to approach new nuclear waste under a market-based policy. To this end, amendments to the Nuclear Waste Policy Amendments Act (HR 3053) could be made with options for Nevada regarding Yucca Mountain that give Nevada complete control and still allow the DOE to meet its obligations for existing nuclear waste. And, an option could be made for the nuclear industry to manage future waste through escrow accounts and through the transfer of title to waste to third parties licensed by the NRC.

There are also concrete, intermediate steps that ought to be made expeditiously by Congress. At the very least, Congress needs to provide enough funding for both the DOE and NRC to complete the license review of Yucca Mountain. This includes standing up the Office of Civilian Radioactive Waste Management within the DOE.[27] Finishing the review merely brings together all of the relevant information for Congress, Nevada, and the nuclear industry to make prudent decisions about next steps.

The approach to waste management as described by the Nuclear Waste Policy Act is narrow and riddled with dysfunction. Opening waste management to the nuclear industry opens the possibility of a diversity of options and a thriving domestic market. Government management of nuclear waste has achieved neither public consent nor permanent waste disposal. While progress is slowly being made to determine the viability of a permanent site at Yucca Mountain, it is high time that Congress got to work mending the broken system.

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[25] Tubb and Spencer, "Real Consent."
[26] Hezir, "Budget and Financial Management Improvements," p. 13.
[27] Katie Tubb, "Yucca Mountain: The Department of Energy Should Take Steps Now While Awaiting Funding," Heritage Foundation, *Issue Brief* No. 4705, May 17, 2017, http://www.heritage.org/nuclear-energy/report/yucca-mountain-the-department-energy-should-take-steps-now-while-awaiting.

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Mr. FARENTHOLD. You are very welcome.

We'll now proceed with questions. Since I will be staying through the whole hearing, I'll reserve my questions to bat cleanup. So we'll start first with the gentleman from Kentucky.

Mr. COMER. Thank you, Mr. Chairman.

It's my understanding that taxpayers across the country have already paid over $6 billion in damages because the Federal Government has failed to honor its commitment to remove spent fuel from nuclear reactors around the country. Additionally, it's estimated that the final tab that taxpayers are responsible for could rise to $30 billion.

What immediate actions can be taken by this Congress to get a feasible used fuel program operating so that the taxpayer liability can be limited and hopefully eliminated going forward? It's up to anybody.

Mr. O'DONNELL. I'll take an open crack at it, Congressman. I appreciate the question.

I think the first thing, from a regulatory standpoint and a State regulator, is there's been an application made to the Nuclear Regulatory Commission. And the first thing this Congress can do is to fund that application going forward, either through the Department of Energy reasserting itself as the applicant, which it hasn't been doing. So they'll need some money to do that. The President's submittal contains money. So we need to get that funding stream going, as well as the NRC needs to be fully complemented and ready to take this application back up.

As a State regulator, if we get an application, Mr. Chairman, for somebody who wants to do something under our purview, we can't just suspend that in contravening our own law. We have to run that to ground, and we have to get an answer to that application. And so one way or another, we need that answer. That's where the scientific-based solutions will occur. And I think that's what this Congress can do immediately, is get some funding going and get these programs stood back up so that we can continue down the path of getting the NRC doing the scientific evaluation of the application.

Mr. COMER. Okay.

Mr. Victor?

Mr. VICTOR. I'd agree with what Mr. O'Donnell said. But let me add the vital importance of interim storage. I recognize Representative Issa, he and the congressional delegation in California spent a lot of time with us around this.

We can begin the process of restarting Yucca Mountain in a permanent repository. And I understand the imperative of that. But there's also a very large cost savings that comes from not storing spent fuel at lots of sites all around the country, but at a smaller number of sites. And so for people who are concerned about the cost of all this, in addition to a variety of other objectives here, interim storage is a vital role to play here, as does a smart—Dr. Lyman pointed to a smart transportation program so that we can efficiently, once we have places to send it, and ideally as many places as possible so we have competition, an efficient transportation system so that—which is really a DOE responsibility in the end as well as State and local planning—an efficient transportation

system so that we can move as many of these shipments to those facilities as possible.

One last comment here briefly, which is we get regular updates on the status of all the canisters at San Onofre. And what's striking to me is that there are dozens of canisters that are already ready to ship. And in the next few years, there will be dozens more. And so we and many other sites are ready to go as soon as there's a place to send it.

Mr. COMER. Okay. Thank you.

Mr. O'Donnell, it's great to have you here today in your role as chairman of the National Association of Regulatory Utility Commissioner's, subcommittee on nuclear waste disposal. I was made aware that you previously worked at the Calvert Cliffs Nuclear Power Plant just down the road in Calvert County, Maryland. So you are very familiar with the issues we're here to address today.

It's my understanding that electricity ratepayers, who are also constituents of ours, have paid billions of dollars to their electricity bills to have nuclear waste removed from the reactors around the country. However, as we all know too well, they've got nothing in return.

On behalf of the ratepayers around the country, can you speak to how—exactly how much money they have paid into the nuclear waste fund?

Mr. O'DONNELL. Congressman, the estimates that I've been given are the corpus of the Nuclear Waste Fund payments and the interest that has accumulated over time on those payments into the corpus is $40 billion. So it's a lot of money.

I can tell you, in my home State of Maryland, the estimate—and we have State-by-State estimates. The ratepayers in Maryland alone have paid $800 million into this fund. And that's a very, very significant payment for a small State like Maryland with 5 or 6 million citizens. So every State has this problem, every State has paid a lot of money, and all of our constituents deserve some action for that payment.

Mr. COMER. Okay. Thank you, Mr. Chairman.

Mr. FARENTHOLD. Thank you.

Mr. Raskin indicates he's going to stick with me and bat cleanup. So I will now recognize the gentleman from California, Mr. Gomez.

Mr. GOMEZ. Thank you, Mr. Chair and Acting Ranking Member Raskin.

We all know nuclear waste is a serious health hazard. It threatens the health and safety of Americans from 329 congressional districts across 44 States and the District of Columbia. But we haven't come up with an effective plan for what to do with this waste for decades.

As it stands right now, most of our nuclear waste is stored at facilities ill-equipped to do the job. Nowhere is this truer than at the San Onofre Nuclear Generating Station in southern California where 3.5 million pounds of nuclear waste sit atop of a fault line next to the Pacific Ocean. Our inability to find an effective repository for our nuclear waste is a shortcoming that we can no longer ignore. Waiting for a nuclear waste crisis is a recipe for disaster, and I'm glad that this subcommittee is here today to explore this issue further.

I believe that safety needs to be the top priority in selecting a permanent site for our nuclear waste. This might sound obvious to some, but our plan in southern California for the better part of the last 50 years has been to store nuclear waste in an area known for earthquakes, and that's just not very smart.

As someone who grew up in southern California, in Riverside, and actually would go surfing in the San Onofre State—or tried to go surfing in the San Onofre State beach, I'm well aware that most people are just concerned about the safety of the facilities and what to do with the nuclear fuel once the facilities are no longer generating electricity.

So this question would—goes to Dr. Lyman. Can you briefly describe some of the safety hazards involved with the storage of nuclear waste for the shortterm and the longterm?

Mr. LYMAN. Yes, Congressman. Thank you for your question. At reactor sites, spent nuclear fuel is stored in two main ways. One, in the water-filled pools where it's put immediately after discharge from the reactor, and also in what are called dry storage casks, which are smaller structures which house a smaller amount of spent fuel and do not require water or—for cooling. And typically, spent fuel can be moved from the pools to the dry casks after a period of about 5 years once the decay heat is decreased so that can be done safely.

So both of those pose problems but in different ways. So the spent fuel pools are overcrowded in this country. The Nuclear Regulatory Commission allows them to densely pack the fuel. And as a result, those pools are vulnerable in the event of an earthquake or a terrorist attack that could cause the water to drain out rapidly, leading to a large-scale fire in the pool and a large release of radioactive material. Colleagues of mine have done calculations that showed an event like that in the United States could affect millions of people hundreds of miles away from the reactor for a very long time.

So the first thing that needs to be done is a policy to reduce the—store the density of spent fuel in the pools. And that can be done onsite by increasing the amount of dry cask storage at reactors.

Now, dry cask storage is safer because—for a number of reasons, but it's not completely invulnerable. And there are a number of ways where the NRC could take action to increase the safety and security, especially at sites that are more vulnerable than others, let's say on the San Onofre. But it's a more manageable problem. And so I do believe that there is some time, if those issues are addressed, to store spent fuel and dry cask safely at reactors until a better national solution is come up with. Thank you.

Mr. GOMEZ. Thank you, Mr. Lyman.

This is a question for Dr. Victor. Is it fair to say that one of the major concerns of members of the San Onofre community have about this nuclear waste remaining onsite is safety? And what are some of the concerns of the—what are some of the specific concerns about keeping it there?

Mr. VICTOR. Thank you very much, Representative Gomez. I'd agree with what Dr. Lyman said here. We—there's a range of views about the concerns on the onsite storage of spent nuclear

fuel. There are some people, a minority, and I think not well informed, that think the dry cask systems are not safe. I think all the evidence points to exactly what Dr. Lyman said.

For the longterm, what people are concerned about is two things. One is they're concerned about making sure that there's a longterm program for monitoring and—the canisters and their integrity. And as long as we're stuck with it there, we want to make sure it's being monitored, there are programs in place to detect any faults and so on. We've had, at our most recent meeting, extensive briefings about this. There's been a lot of work in this area. I am encouraged that there's been a lot of progress in that area.

The other concern that people have is less tangible, but I think maybe even more important, which is that people are seeing the rest of the site being dismantled, and they don't understand why it is that the spent fuel is stuck there. And they're really angry about that. Because the deal that was made was we paid the Federal Government to remove it, and it's not being removed. And that's a—that's a palpable anger and sentiment in the community.

Mr. GOMEZ. Mr. Victor, Mr. Lyman, thank you for your testimony. I'm out of time, so I yield back.

Mr. FARENTHOLD. Thank you, Mr. Gomez.

I see Mr. Issa from California has arrived. Without objection—Mr. Issa is a member of the full committee—will be authorized to participate in this subcommittee hearing. Without objection, so ordered.

Up next is a gentleman from—Mr. Palmer.

Mr. PALMER. Thank you, Mr. Chairman.

I want to go back to some questions that Mr. Comer brought up about the amount of money that is being spent. I have a document here on the cost of an actual nuclear waste management—I'd like to have entered into the official record, if I may, Mr. Chairman—that shows that since 2009, the Federal Government's liabilities have escalated from $12 billion to over $30 billion.

Mr. FARENTHOLD. Without objection.

Mr. PALMER. Thank you, Mr. Chairman.

Ms. Tubb, the Federal Government has spent more than $6 billion on settlements to utilities for the failure to collect nuclear waste, and this amount grows every year. Additionally, the DOE estimates that future liabilities will exceed $25 billion.

What would it cost to make Yucca Mountain operational so that the taxpayers are not continuing to be on the hook for these settlements?

Ms. TUBB. The DOE last gave a lifetime—life cycle cost estimate in 2008. In 2017 numbers, I think that estimates up to $97 billion over 125 years.

Mr. PALMER. I'd like to point out, as we're operating in a deficit, that's money we have to borrow.

Can you give us some idea of the way that CBO treats money that was paid to the Nuclear Waste Fund?

Ms. TUBB. Sure. CBO, unfortunately, doesn't do Congress many favors with the Nuclear Waste Fund. Money comes in as mandatory receipts. And so the fund offsets mandatory spending. It goes out as discretionary appropriations, and so the Nuclear Waste Fund has to compete with other congressional priorities. And so

each of these baskets of money is treated under different budgeting rules. It makes it very difficult to either reform the Nuclear Waste Fund, which is the principal mechanism for moving forward with Yucca Mountain or any other plan, and it also makes it very difficult to actually spend money for Yucca Mountain or any other plan.

I would also add that when DOE spends money to reduce that taxpayer liability, CBO does not recognize that taxpayer savings. And so, again, when DOE spends money, it can't offset that in savings to taxpayer liability.

Mr. PALMER. So basically, what we're doing is spending the fees that have been collected on other projects.

Ms. TUBB. Correct. So the Nuclear Waste Fund is funded by ratepayers and utilities. There's no taxpayer contribution to the Nuclear Waste Fund, and yet the Nuclear Waste Fund has to compete with taxpayer priorities based on these budget rules.

Mr. PALMER. So to make the taxpayer whole in respect to the Nuclear Waste Fund, Congress, at some point, will have to appropriate money to make it up, or does the tax—does that—do we just leave that money off the table?

Ms. TUBB. The only way the taxpayer is liable is for paying the Department of Energy's legal fees. So as far as providing for the nuclear waste management services, that's all on ratepayers and utilities, as it should be, and as according to the Nuclear Waste Policy Act. Taxpayers are on the hook for DOE's delinquency and being found in courts.

Mr. PALMER. Let me change directions a little bit here and continue with you. The Department of Energy's license application for Yucca Mountain has languished at the Nuclear Regulatory Commission since 2008. What are the barriers that are holding this up?

Ms. TUBB. Principally, it's politics. It's no secret that the Obama administration was not supportive of Yucca Mountain. And a lot of it has to do with former Senator Harry Reid. I would also say that, you know, there are scientific technical contentions, many of which are offered up by the State of Nevada. And as mentioned, I think we need to move forward with those and air those, you know, as the law requires. And if there are problems with Yucca Mountain, that needs to be known. And that's part of completing the Yucca Mountain licensing process.

Mr. PALMER. Just less than a half a minute left.

How long would it take for Yucca to become operational if the license were approved?

Ms. TUBB. Not being an engineer, I don't have a good answer on that, so I'll have to pass.

Mr. PALMER. All right.

Thank you, Mr. Chairman. I yield back.

Mr. FARENTHOLD. Thank you very much.

I've just been informed that votes will be scheduled around 3:15. We're going to see how far we can get and then determine what we're going to do at that time.

I'll now recognize Mr. Clay for 5 minutes.

Mr. CLAY. Thank you, Mr. Chairman and Ranking Member Raskin and other members, for extending me the opportunity to join you this afternoon on a matter of great urgency to our Nation

and also to the region that I represent in St. Louis: The safe disposal of nuclear waste.

And some might wonder why I am cosponsoring this bill to finally establish a national nuclear waste repository at Yucca Mountain, and the answer is simple: The U.S. Government created a nuclear waste problem 75 years ago, and we have a responsibility to finally clean it up. And that long story began in my congressional district.

In 1942, the water department secretly contracted with Mallinckrodt Chemical in St. Louis to enrich yellowcake uranium from the Belgian Congo to fuel the Manhattan Project. That enriched uranium was used to fuel our Nation's first atomic bombs created in Los Alamos, New Mexico, in the Met program, which existed from 1942 to 1945 was essential to winning World War II. But the nuclear waste that was generated from the manufacturing of those original atomic bomb and others that would follow forged a curse of radioactive contamination that is still inflicting pain and suffering across this country. And the waste from our Nation's nuclear power plants has compounded this problem.

In Missouri, several failed attempts to clean up the original nuclear waste caused dangerous radioactive contamination at sites in downtown St. Louis; at Lambert St. Louis International Airport; at Latty Avenue in North St. Louis County; at Coldwater Creek, which is a tributary that flows into the Mississippi River. And finally, in 1973, approximately 50,000 tons of that same nuclear waste was illegally dumped at West Lake Landfill in Bridgeton, Missouri, and mixed with other debris. That nuclear waste includes radioactive uranium, radioactive thorium, radioactive barium sulfate, and other toxic contaminates.

Unbelievably, that radioactive toxic mess dumped illegally at West Lake 44 years ago is held in an unlined limestone landfill near the Missouri River, near a major hospital, near Lambert St. Louis Airport, near schools and interstate highways. And most troubling of all is the appalling fact that 1,000 of my constituents live less than 1 mile away from this illegal nuclear waste dump. And it would be almost impossible to find a dumber, more dangerous, more completely irresponsible place to dump nuclear waste than West Lake Landfill. And if you think this potential environmental disaster couldn't get any worse, you're wrong.

For the last 5 years, we have also been dealing with a creeping underground landfill fire at the adjacent Bridgeton sanitary landfill, which is owned by Republic Services and is under the supervision of the Missouri Department of Natural Resources. And that underground fire is less than 1,000 feet away from the buried nuclear waste.

My friends, the U.S. Government created this radioactive mess, and we have a clear and unavoidable responsibility to finally clean it up. That is what opening up the Yucca Mountain registry—repository is all about.

So let me say this to all of you. When the U.S. Government creates a problem, when we put citizens at risk, when we disrupt their lives, when we destroy the peace and property values of their neighborhoods, and when we allow the health of innocent citizens to be harmed because of our own inaction, we must make it right.

And I was the first Member to ask that all of the waste be removed, and I will continue to do that.

And I see my time is up. But, Mr. Chairman, I mean, I would support this bill because I think that the waste needs to be removed and put into a safe place, and it's the government's responsibility.

I yield back.

Mr. FARENTHOLD. Thank you, very much.

I will now recognize the vice chairman of the subcommittee, the gentleman from Arizona, Mr. Gosar.

Mr. GOSAR. Thank you, Mr. Chairman, for this hearing today.

Nuclear energy is one of the most reliable and stable energy sources in the world, and we should continue to look to advance further development in the secure storage of used materials. Nuclear power and the subsequent waste that comes from spent nuclear fuel is an issue which in my district I am very familiar. The Palo Verde nuclear power plant in Maricopa County is the largest nuclear generation facility in the United States. Palo Verde provides 35 percent of the total energy in Arizona, employs over 2,000 full-time workers, and has roughly a $1.8 billion economic impact on the State. And while I could speak to volumes of the benefits of nuclear power and plants across the U.S., the facts remain that temporary storage onsite of spent nuclear fuel and high-level radio waste from such power plants is a costly and hazardous practice.

Mr. O'Donnell, first to you. I want you to be very concise. Can you give us a breakdown of the incurred cost to the consumer since the enactment of the Nuclear Waste Policy Act?

Mr. O'DONNELL. I am a recovering elected official from Maryland, so I will try to be as concise as possible, Congressman.

So the five times the consumers have paid just for waste storage: The original construction. And then, after original construction, the Nuclear Waste Fund. And then, after the Nuclear Waste Fund, because we didn't meet our statutory deadlines of reracking of the spent fuels that were already paid for, number one. So those first three things. And then, also, we have paid into the Judgment Fund. And I am missing one. But there are five impacts.

And the fund itself is $40 billion. And the untold billions of liability that the consumers have, just it is mind boggling.

Mr. GOSAR. So, Mr. Smith, can you describe for us what you believe is the best solution for the long-term storage of existing spent nuclear fuel and high-level waste currently stored at nuclear facilities around the country.

Mr. SMITH. So I represent mostly defense waste. But finishing the licensing process of Yucca Mountain will give us a final determination on whether that facility can hold the high-level waste and the commercial material that we have. And if it doesn't, then we have got to find other alternatives, which is what we are discussing today. And that is, you know, the classification of high-level waste and changing that so that we can reroute some of this waste to other locations around the country.

Mr. GOSAR. So we have looked at other areas, have we not, Mr. Smith?

Mr. SMITH. We have. We are working with the Department of Energy right now to open up opportunities at WIPP for other mate-

rials that could be classified as transuranic waste as opposed to high-level waste, and that is one of the things that we are dealing with at this point.

Mr. GOSAR. We looked at a space in Texas, did we not, that was deemed geologically unsafe? Is that true?

Mr. SMITH. I'm not sure about the geological——

Mr. GOSAR. The salt domes?

Mr. SMITH. I'm not sure about the geological status of that, but they're continuing to look at waste control specialists for storing additional wastes at their community.

Mr. GOSAR. Are you aware—where are these other sites?

Mr. SMITH. Yes, sir.

Mr. GOSAR. Okay. So, Ms. Tubb, what would you suggest to legislators as the best way forward to ensure the success of a long-term nuclear waste depository? What would be the steps, and how would you facilitate those? In what order?

Ms. TUBB. I think the first step is completing Yucca Mountain licensing process. Getting an up or down decision on that brings a lot of valuable information to the table.

Assuming the NRC approves Yucca Mountain, I think we need to engage the State of Nevada. You could consider a situation where DOE essentially contracts with the State of Nevada, giving Nevada a lot of control over that situation for existing waste. I think we need to look and reimagine how we treat future waste. As I talked about, creating market incentives and giving the nuclear waste industry—I am sorry—the nuclear industry a say in how they manage nuclear waste. So a system for existing waste, a system for future waste.

Mr. GOSAR. Would you agree with that, Mr. Victor?

Mr. VICTOR. Yes. I think the Yucca process should restart. We don't know what the outcome of that is going to be. And so I think it's really important that we not continue to put all of our eggs in one basket. That's why we're so keen on interim storage as well.

Mr. GOSAR. Thank you.

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

Mr. FARENTHOLD. Thank you very much.

We will now recognize Mr. Raskin.

Mr. RASKIN. Mr. Chairman, thank you very much.

Dr. Lyman, let me start with you. What do you think are the specific dynamics and consequences of climate change today that should be informing our short-term and long-term approaches to dealing with the nuclear waste storage problem?

Mr. LYMAN. Yes. Thank you, Congressman Raskin.

UCS is very concerned about the threat of climate change in a number of different ways. With regard to nuclear power, obviously, the estimates that the NRC has made in the past for the vulnerability of nuclear reactor sites and waste sites to natural phenomenon, including flooding, has to be revisited. And that is true both for operating reactors, and for the waste stored there and also for any new waste storage facilities.

Unfortunately, the process for updating information on climate and the ability to look forward and to be anticipatory instead of reactive are problems that the NRC has had. So there needs to be a greater realization of the uncertainty that is created by the po-

tential for increased hazards at nuclear reactors and at waste facilities. And that needs to be incorporated into the planning. When you're talking about nuclear waste, which has a potential hazardous lifetime of millions of years, obviously, there is only so much you can do. But certainly you do need to address those uncertainties and ensure that you have enough safety margin to accommodate a potentially significant increase in hazard at those sites.

Mr. RASKIN. Great.

And similar question for Dr. Victor. The country is reeling now from Hurricanes Harvey and Irma and Jose, and people are still recovering from Katrina and Sandy. The San Onofre nuclear power station is located on the California coast. Are you concerned that natural disasters like tsunamis or earthquakes could threaten the safety of nuclear waste that's stored at that facility?

Mr. VICTOR. So, broadly, yes. The disaster matters. So there has been a lot of analysis of the different kinds of disasters. As a general rule, the tsunami risk there happens to be lower. The earthquake risk is high. And that's why the system at San Onofre is engineered to withstand a much higher seismic event, earthquake, than typical dry cask facilities. And I think, over the long term, sea level rise is a really significant—and storm surge—is a really significant concern. I think everybody has agreed that they want to move it out of—the safest place for the San Onofre site is in dry cask. And the safest, best long-term solution is out of San Onofre, end of story.

Mr. RASKIN. Thank you. But I have had several conversations with my colleague, Congresswoman Titus from Nevada, who is very interested in this question of consent.

And, Dr. Lyman, let me come back to you. In considering long-term alternative solutions to the Yucca Mountain possibility, do you believe that we should seek to get approval from the local communities and State government wherever a site may be located?

Mr. LYMAN. Yes, I think, generally speaking, the concept of consent-based siting is a good one. Unfortunately, it's hard to fully understand how to implement that.

And so there certainly needs to be greater recognition of State and local concerns. However, that also has to be, as I said, in the context of a national solution. So we can do more. I don't know what the answer is at this point. But certainly there has to be a different process than the one that led to the selection of Yucca Mountain where the Nuclear Waste Policy Act and its amendments were rigged, essentially, for the rest of the country to gang up on Yucca Mountain. So the flaws of that process have to be examined and——

Mr. RASKIN. But the Blue Ribbon Commission on the Nuclear Future, in 2012, did recommend placing consent-based siting at the center of successful planning in going to the future.

Dr. Victor, back to you. Do you think that we are going to be able to successfully resolve this problem if we don't use this principle of local consent?

Mr. VICTOR. I think the principle of local consent is vitally important, you know, with the caveats that Dr. Lyman laid out. We need to have a national strategy. We need to set this up so that any particular interest can't hold up the entire process.

To me, what's most interesting is we have had in west Texas and in eastern New Mexico—especially in eastern New Mexico—a tremendous amount of progress on this front. We've had representatives from the eastern New Mexico site come visit our community engagement panel. There's informed consent about opening that site up, and people are ready.

Mr. RASKIN. Thank you very much.

I yield back, Mr. Chairman.

Mr. FARENTHOLD. Thank you, Mr. Raskin.

We will now recognize the gentleman from Montana, Mr. Gianforte.

Mr. GIANFORTE. Thank you, Mr. Chairman.

And thank you for the panel today for your testimony. This is an important issue, and I appreciate your input.

Ms. Tubb, I had a question for you. What's been the practical effect of the last administration's closing the Office of Civilian Radioactive Waste Management? And how has that impeded the efforts to move forward with the Nuclear Waste Policy Act and the will of Congress?

Ms. TUBB. Well, we certainly lost a lot of time. As I said, we're basically back to where we were in 2008 when the Department of Energy first submitted its application. It's going to take a lot of effort to bring back the Office of Civilian Radioactive Waste Management. I think that's very doable, having talked with people who were originally involved in the license, that people are passionate about this project and want to see it move forward. So it's definitely doable. It will just take time and money to bring those resources and those people back together.

Mr. GIANFORTE. And as that office was closed, can you be more explicit about what it actually impeded? What did it shut down? What has the impact of that been?

Ms. TUBB. Well, I mean, a lot of people have moved on and been replaced within the Department of Energy. That's a lot of institutional knowledge around this specific project that's very unique that has since been spread across the country, spread within DOE. Some of them have even retired. And I think a lot of that can be brought back. But that takes effort.

Mr. GIANFORTE. Yeah. Okay. And then do we know what the previous administration did with the funds that were allocated for this office? Did that get returned to the Treasury, or did it go someplace else?

Ms. TUBB. So a lot of it just did not get spent. Department of Energy has now roughly $20 million left from the Nuclear Waste Fund that was appropriated from Congress. The Obama administration just chose not to use that money both in DOE and NRC, and that's what some of those court cases were about.

With OCRWM, a lot of those institutional functions were spread within the Office of Nuclear Energy or just atrophied.

Mr. GIANFORTE. Okay. Great. And I have no further questions.

I yield back the remainder of my time, Mr. Chairman.

Mr. FARENTHOLD. Thank you.

I now recognize the former chairman of the full committee, the gentleman from California, Mr. Issa.

Mr. ISSA. Thank you, Mr. Chairman. Thank you for including me here today.

As Mr. Victor said, I represented and have represented San Onofre for 16–3/4 years. During most of those years, they produced between 1100 and 2200 megawatts every day, 24 hours a day depending upon whether one or two of the reactors were online. And, of course, more than half the time, two reactors were online.

With an ill-fated non-nuclear portion of the plant, that being the steam generators, arriving defective, it was prematurely shut down. So one thing, Mr. Victor, if you'll describe briefly the situation that we deal with because all of the spent rods had to be removed, brand new ones, from two reactors, unexpectedly and then put into water storage.

Mr. VICTOR. Very briefly, essentially, the entire fuel load that has ever been in those two reactors, plus unit one originally, is still onsite, with a couple of exceptions.

Mr. ISSA. Right. But some are in dry cask.

Mr. VICTOR. And some are in dry cask. They are currently building a facility to take the rest of the fuel that's in the pools and remove it. That process is on track, and as far as I can tell will be done by the end of 2019, at which point nearly all—not all, but nearly all—those canisters will be ready to ship if there is a place to ship them.

Mr. ISSA. So, with the early demise with the plans to build an above-ground—and I call it above ground, but it's slightly below ground—a holding area a few hundred feet from Interstate 5, a few hundred feet from San Onofre surfing area, the Trestles, and on earthquake fault, we will have 30 years of three reactors worth of spent rod sitting in dry cask from more or less—and I will use 2020, if you don't mind—for 10,000 years if we don't find a solution. Is that correct?

Mr. VICTOR. That's correct.

Mr. ISSA. And in your estimation, with your expertise and your involvement in this—and I'll go to the others also—is there any question in your mind that anywhere, anywhere on Earth that is dry, not near populated centers, not near earthquake faults, even if above ground, would be safer than that location in a 10,000-year calculation?

Mr. VICTOR. Anywhere, that's a strong standard. I mean, the middle of this room is probably not a good idea.

Mr. ISSA. Well, let me take, for example, one that I personally witnessed. We did underground testing at Area 51, the nuclear test center in Nevada, not Yucca but another place. Anyone can Google Earth and see mounds left over from those underground tests. That location, is it or is it not safer than on an earthquake fault in a populated area on the edge of the ocean?

Mr. VICTOR. Absolutely. And there's an extraordinary number of sites that would be dramatically safer and better for the communities than where it is now.

Mr. ISSA. So, as we look at places in which there are little or no population for as much as a hundred miles in this country, areas that are dry, that have no apparent aquifers, including Area 51—and I will also say Yucca, but I use Area 51 because it already has underground nuclear materials, we have a large amount of places

that are better—maybe not perfect, but better. So my question to each of you is, with the current science we have, even Yucca mountain and all proposed, currently proposed, interim storage sites, in your opinion, aren't every one of them safer than on the edge of the ocean, whether in Humboldt Bay, Diablo Canyon, or San Onofre, where we have a total of five reactors? Three are offline; two more will go offline.

And I'll start with Ms. Tubb.

Ms. TUBB. It certainly sounds like that to me. I am not a nuclear engineer, but I would say likely.

Mr. ISSA. Doctor?

Mr. LYMAN. Yes. Well, not——

Mr. ISSA. We're not looking for perfect. I'm just asking the question of better.

Mr. LYMAN. Yeah. I realize that. It's just—on the record, of course, there are aquifers at the Yucca Mountain site. In fact, when I went to the——

Mr. ISSA. Is the water as close as it is at San Onofre?

Mr. LYMAN. No. But it's not completely dry. And so it's a subtle—you know, there are issues. And, of course, there are short-term places where, if you could move all the fuel right away, then there would be a lower risk. But you do have to then take into account the transportation risk as well. So, you know, you really need to look at an integrated program, and that's the complication.

Mr. ISSA. Okay. Well, and I'm not trying to cut you off, but for everybody there, when I look at a current location that's starting in—let's call it January of 2020, we would be able to move, by sea, if we chose, without ever going through a populated area, all of those dry casks somewhere else. From the moment it gets on to a barge, in my estimation, it is safer than where it is. Is there anyone that disagrees that there aren't a number of places inherently safer, starting in 2020, and it would be reckless to leave them in the least safe place that one could describe, on an earthquake fault, in a populated area, between an interstate and the ocean?

Mr. Victor?

Mr. VICTOR. No. I completely agree. There are a lot of places that would be a lot smarter. And, to me, what's striking is I can understand why people are concerned about permanent repositories and making sure that the science is done properly there. And that takes time. But these interim facilities are now getting geared up, and I think that's a crucial part of this.

Mr. ISSA. Mr. Smith?

Mr. SMITH. So the Santa Ana River site sits on a geological fault, and we store thousands of canisters and waste tanks with single capability in terms of insulation.

Mr. ISSA. Single wall, the earlier——

Mr. SMITH. Single-wall insulation. And we're now double-stacking canisters. And while we do what I consider a very safe job, as time moves on, you know, that's going to become much more problematic to my community. So I certainly think a geological repository—and if you have ever been to Yucca Mountain, it certainly seems to be the best fit for that material.

Mr. ISSA. Mr. O'Donnell.

Mr. O'DONNELL. Thank you, Congressman Issa. I will say this. I've been to Yucca Mountain. I've looked at the national laboratory experiments. I've witnessed it with my own eyes, and I can tell you that every part of my nuclear-trained background and mind tells me that, if you can't do it there, you're going to have a hard time finding any place to have a deep geological repository in this country. You have to be able to do it there, and I think we have proven that by the national laboratories.

Additionally, we need to make sure that we don't allow interim solutions—and I'm certainly open to interim storage, not onsite but consolidated. But we have to make sure that that doesn't become the new bottleneck simply kicked down the road for the next generation to solve, because, sir, I have to tell you, I honestly believe that we have a moral imperative to solve this problem and solve it now. And that begins with both short-term solutions and long-term solutions, permanent solutions, and a repository.

Mr. ISSA. Thank you.

Mr. Chairman, if I can close briefly with a short statement. In my district, just a few miles from San Onofre, for 40 years, we stored a rather controversial gas and detergent mixture that was used during the Vietnam war. And that was brought in by regular trucks, and it was shipped in and out. As the years went by, what we discovered was it was a hundred million dollar massive effort to eliminate what was basically gasoline. But, unfortunately, over time, environmental determinations can change. I fear that if we do not find interim storage that give us, you know, consolidated areas, that what the taxpayers will find—and this is probably the premier committee of taxpayers—is that that estimate, which only goes out 95 billion for 125 years of a 10,000-year cycle, will prove the following: The fund will be evaporated. Taxpayers will pay hundreds of billions of dollars if we do not act and act now in a responsible way. I know for an absolute certainty the taxpayers are already on the hook at this point for tens of billions of dollars over the next century. But this is a 10,000-year problem in need of a low-cost, safe solution.

And I really want to thank you and the ranking member for holding this hearing. It's a great first step.

Mr. FARENTHOLD. Thank you.

And as we're in the middle of a vote and running out of time, though I do have some questions, I'm just going to simply state this is a problem that definitely needs to be solved sooner not later. I'd like to find a long-term solution because I do think there are potential risks in moving the stuff twice. But moving it twice is certainly better than leaving it in. As we learned even in the district that I represent, a nuclear power plant in the path of a hurricane, though thank the Lord it performed admirably with zero safety concerns, that may not always be the case. So, again, I wish we had time for questions, but I don't want to hold you all for 45 minutes just to ask you 5 minutes of questions.

So I'm going to thank the panel for participating, thank Mr. Raskin for filling in for Ms. Plaskett, and ask that we all do keep Ms. Plaskett and her constituents and all those affected by these disasters in our prayers.

And, with that, without objection, the committee stands adjourned.

[Whereupon, at 3:25 p.m., the subcommittee was adjourned.]

APPENDIX

Material Submitted for the Hearing Record

Testimony of Senator Dean Heller (R-NV)

Tuesday, September 26, 2017, at 2:00 PM

Before the House of Representatives Committee on Oversight and Government Reform

Subcommittee on the Interior, Energy, and Environment

Hearing Entitled: "Examining America's Nuclear Waste Management and Storage."

Chairman Farenthold, Ranking Member Plaskett, Members of the Committee, thank you for the opportunity to submit testimony for the record for today's hearing.

Since 1987, the Yucca Mountain Nuclear Waste Repository has been a thorn in Nevada's side. Due to political antics, not science, Nevada quickly moved to the federal government's number one targeted location to permanently store all of the nation's nuclear waste. Our state has been fighting this misguided proposal ever since, and we're not finished.

Although I recognize both the crucial role nuclear power plays in our nation's long-term energy strategy and the need to properly store expired nuclear fuel, I remain strongly opposed to any efforts to restart licensing activities for Yucca Mountain. This ill-conceived project would not only cause significant harm to the well-being of my home state and all Nevadans, but also poses a national security risk that is too great to ignore. My position remains clear: Yucca Mountain is dead. I encourage this Subcommittee in today's hearing to move past failed proposals of the past and look to solutions of the future.

We can all agree today that it is in the best interest of our nation that a program to dispose of and store spent nuclear fuel and high-level radioactive waste be implemented as soon as possible. Rather than attempting to force this project on the people of Nevada – a state that currently does not have any nuclear power plants of its own – I believe taxpayers' dollars would be better spent identifying viable alternatives for the long-term storage of nuclear waste in areas that are willing to house it.

Failure to do so will only result in a waste of more taxpayer dollars and a delay in moving forward with any type of a lasting solution concerning the long-term management of high level nuclear while this issue is litigated by the State of Nevada. Governor Sandoval has made clear the State of Nevada will contest over 200 elements of any license application, which will take years to resolve and cost the federal government billions of dollars. This is in addition to the Department of Energy's (DOE's) estimates that an additional $82 billion would be needed to license, litigate, build, operate, decommission, and eventually close Yucca Mountain. With respect to what has already been spent on the repository that adds up to more than $96 billion for the total system life cycle cost for the project.

As a small government, fiscal conservative, I believe taxpayer dollars would be better spent identifying viable alternatives for the long-term storage of nuclear waste in areas that are willing to house it. In fact, 2012 DOE cost estimates show that all other costs being equal, walking away from Yucca Mountain, and starting with a new repository site in a deep salt bed or a deep shale formation, could save between $12 billion and $27 billion over the life of the repository. Before Congress spends any more U.S. taxpayer money on Yucca Mountain, I encourage this Subcommittee in its oversight efforts to ask the DOE what they have learned about repository costs in its previous studies. Furthermore, I believe we need new cost studies on geologic disposal in repositories, studies that include the lessons learned from recent progress with repositories in Europe.

With respect to the economic impact on the State of Nevada, moving forward with Yucca Mountain will cripple my state's tourism economy. Yucca Mountain is located just 90 miles from Las Vegas, Nevada - the world's premier tourist, convention, and entertainment destination. Last year, Las Vegas welcomed nearly 43 million visitors. Over the past decade, the Greater Las Vegas area has been one of the fastest growing in the U.S. with a population that now exceeds 2.1 million people according to an estimate from the U.S. Census Bureau.

Any issues with the transportation of nuclear waste to the site, or issues with storage there, would bring devastating consequences to the local, state, and national economies. Mr. Chairman, would you want to come to Las Vegas knowing that high level nuclear waste is being transported very likely through the heart of the strip?

But let me outline for you the vitally important role tourism plays for the Greater Las Vegas area. This industry accounts for close to 44 percent of local workforce, providing close to $17 billion dollars in local wages and an estimated $60 billion dollars in local impact. Without tourism, every household in Southern Nevada would pay close to $3,000 more in taxes. That is a significant amount of money to individuals and families working to make ends meet.

And people visit not only as tourists, but as business professionals for conferences, meetings, and trade shows – generating another $12 billion in local economic impact. Las Vegas has three of the 10 largest convention centers in North America, and has been the number one trade show destination for 23 consecutive years. This economic driver within the state is a critical component of another related industry that is vitally important to the state of Nevada, namely the gaming industry.

This industry in Nevada alone supports over 430,000 jobs, pays more than $18 billion in wages, and generates close to $8 billion in federal, state, and local tax revenues. Mr. Chairman, the reason I draw the Subcommittee's attention to these numbers is for the

fact that Yucca Mountain will have very real negative economic consequences for Nevadans.

This is due to the fact that we cannot guarantee that we can safely transport that volume of nuclear waste to Yucca Mountain without the threat of a transportation accident along the proposed routes. Under the Nuclear Waste Policy Act, we as a nation are looking at shipping 9,495 rail casks in 2,800 trains, and 2,650 trucks hauling one case each to Yucca Mountain over 50 years. If the capacity limit at Yucca is more than doubled as has been discussed, DOE would ship about 21,909 rail casks in about 6,700 trains 5,025 truck casks to Yucca Mountain.

I ask this Subcommittee, do you really believe that over the span of 50 years that there won't be one single transportation accident with an ensuing radiological release? And under DOE's proposal, these shipments would use 22,000 miles of railways and 7,000 miles of highways, crossing over 44 states and the tribal lands of at least 30 Native American Tribes, the District of Columbia, and 960 counties with a 2010 Census population of about 175 million. Between 10 and 12 million people live within the radiological region of influence for routine shipments. That is within one-half mile of these rail and highway routes. In effect, these rail and highway routes would impact most of the nation's congressional districts – estimates show close to 330 districts.

Moreover, if there was a spill or an accident, questions remain within the DOE regarding its response time for emergency radiological exposure. This is not to even mention the issue of private ownership of rail rights-of-way, making it uncertain who would even control accident sites.

What we do know is that the local communities would be the ones forced to suffer any type of long-term effects of radiation exposure. This is in a state that was home to our nation's nuclear test site, and the surrounding communities have suffered for years from resulting exposure. I ask this committee, should Nevadans be forced once more to shoulder this burden?

I believe that states, like Nevada, should have the ability to decide for themselves as opposed to having the federal government tell them what to do. Mr. Chairman, I come to the table today with a bipartisan, bicameral solution that ensures that states have a meaningful voice in this process.

My Nuclear Waste Informed Consent Act would allow for the construction of a nuclear waste repository only if the Secretary of Energy has secured written consent from the governor of the host state, affected units of local government, and affected Indian tribes. This is consistent with the consent-based siting initiative to site waste storage and disposal facilities initiated by the DOE in late 2015.

Identifying communities that are willing hosts for long-term repositories, rather than forcing it upon states, is the only viable solution to our nation's nuclear waste problem. I encourage this subcommittee to focus its efforts on that worthwhile initiative.

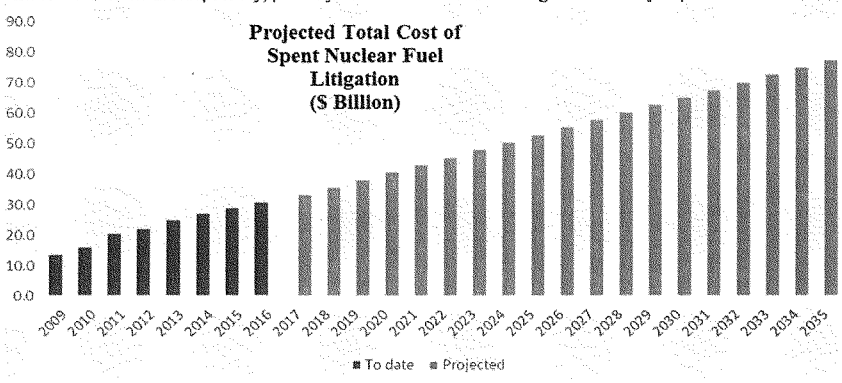
Failing to do so would just squander more time and resources that would be better spent pursuing viable solutions to this important public policy challenge.

Chairman Farenthold, Ranking Member Plaskett, and members of the Subcommittee, thank you again for the opportunity to submit testimony today. I stand ready to partner with you to find a viable solution to this problem once and for all.

The Costs of Inaction on Nuclear Waste Management:

Spent Nuclear Fuel Litigation Costs Overview

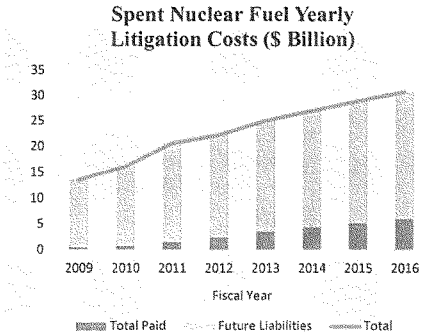
Summary: When the Nuclear Waste Policy Act of 1982 (NWPA) was enacted, Congress set a statutory deadline of January 31, 1998 for the Federal government to pick up spent nuclear fuel from commercial nuclear power plants for permanent disposal. Nuclear utilities signed a contract with the Department of Energy (DOE) requiring this deadline to be met. In 1987, Congress amended the NWPA to select the Yucca Mountain site as the location of the first repository, partially out of concern with meeting the statutorily required deadline.



Projected future litigation costs if the Federal government does not open Yucca Mountain

After DOE missed its deadline, utilities sued the government to recover costs associated with managing used fuel. Courts ruled in favor of the utilities and awarded financial damages in a series of legal decisions.

These legal payments are paid from an account known as the "Judgement Fund," which is a permanent, indefinite fund that pays damages resulting from claims against the United States. Payments from this fund are not subject to budget caps or annual appropriation.



Approximate Annual Payments for Spent Nuclear Fuel Litigation ($ Millions)	
Year	**Payment**
2009	$567
2010	$274
2011	$759
2012	$1,000
2013	$1,100
2014	$800
2015	$800
2016	$800

Since 2009, the Federal government's liabilities have escalated from $12 billion to over $30 billion. Each year that DOE delays in opening the Yucca Mountain repository, taxpayer liabilities accrue. Recently, about one third of all Federal government payments due to litigation have gone to pay for our nuclear waste costs.

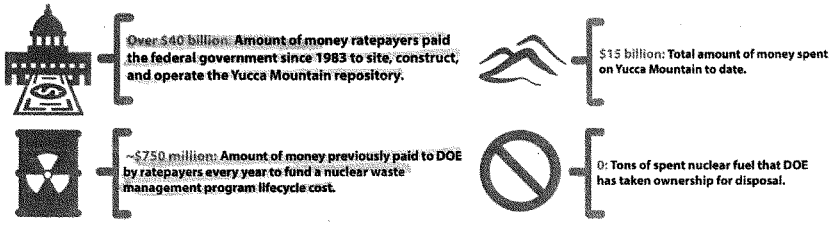
NUCLEAR WASTE POLICY AMENDMENTS ACT 2017

The Nuclear Waste Fund, Scoring, Historical Context and Legislative Fix

35 Years of "Pay Something for Nothing:" The Creation of the Nuclear Waste Fund

- The Nuclear Waste Policy Act (NWPA) established a "fee-for-service" financing mechanism in which those that benefited from electricity generated by nuclear power paid the federal government for a multi-generational program to dispose of the spent nuclear fuel (SNF).
  - Ratepayers, through utilities, paid into the Nuclear Waste Fund (NWF), which set the authorized level of spending for the program, while spending from the NWF was subject to annual appropriations by Congress.
  - The NWPA initiated a one mil per kilowatt-hour fee, or tenth of one cent, on nuclear-generated electricity (Fee), to support the NWF.

Vital Numbers:



Spending Nuclear Waste Fee on Anything but Yucca: CBO Accounting Rules

- A series of actions since 1982 altered the NWF collection and use away from original intent by Congress and resulted in a mismatched way the Office of Management and Budget (OMB) and the Congressional Budget Office (CBO) count receipts and spending.
  - The current CBO accounting rules have taken the money that was paid for nuclear waste and spent it on other government programs.
  - In 1985, the Gramm-Rudman-Hollings Balanced Budget Act separated out "mandatory" spending and receipts from "discretionary."
  - Revenues from the Fee were classified as mandatory receipts and CBO scoring policy applied that funding to "deficit reduction" the year in which the money was collected.
  - Spending on nuclear waste programs was subject to annual appropriation, therefore is classified as discretionary spending. Discretionary spending is subject to annual budget caps and only scored the year in which money is spent.
- Because spending was classified as discretionary outlays, each dollar that was spent on nuclear waste management counted against the budget cap and directly competed with other federal spending priorities, such as projects by the U.S. Army Corps of Engineers, social programs, or any budget account funded through the annual appropriations process.
  - The NWPA directed the NWF to be invested in U.S. treasuries to accrue interest from maturities. However, CBO considers the interest generated on the NWF to be an intergovernmental transfer and does not credit the U.S. Treasury with any new revenue.

Vital Numbers:

$37 billion: Current balance of the Nuclear Waste Fund, which is the total value of all ratepayer contributions and accounting for annual interest accrual.

$30 billion: Amount of money taxpayers are liable for because of court-ordered claims due to the lack of Yucca Mountain that is not subject to budget caps and paid out from a special separate Treasury Fund.

$1.7 billion: Interest generated from NWF investment in U.S. government securities during FY2016.

$0: Actual new revenue to the federal government on the NWF during FY2016.

19: Years past the statutory deadline to dispos of nuclear waste.

Phantom CBO Baseline:
How Congress Spends Money That Doesn't Exist

- In 2013, following the Obama Administration's termination of the Yucca Mountain Project, the D.C. Circuit Court of Appeals ruled that DOE could no longer collect the fee, as the secretary had no credible cost estimate to justify the collection of the fee.
- Then Secretary of Energy Ernest Moniz set the fee to zero, as directed by the court. However, CBO continues to score collection of the Fee as "50-50" because law does not prohibit the fee from being reinstated. Therefore, CBO's baseline projects Fee collection every year.

Vital Numbers:

~$3 billion: Amount of money ratepayers paid from October 2010 through May 2014 to the federal government after President Obama terminated all Yucca Mountain work.

~$350 million: Amount of money that CBO annually claims in Fee baseline projections since the courts stopped collection of the Fee in 2014.

$3.5 billion: CBO's total projected Fee revenue in its 10-year scoring window that is included in the FY2018 Budget Resolution.

~$1 billion: Amount spent on other government programs from 2014-2017 because of CBO's phantom "baseline" nuclear waste fee.

$0: How much Fee collected from May 2014 through today.

How does H.R. 3053 fix this?

H.R. 3053, the Nuclear Waste Policy Amendments Act, would reform the Nuclear Waste fund to protect ratepayers. These commonsense fixes to the broken financing mechanism outlined above include:

- Prohibiting collection of the Fee until the federal government finally gets an answer whether the Yucca Mountain repository can receive a license;
- Limiting future ratepayer payments to the federal government to 90% of what is spent annually to end CBO's accounting gimmicks; and,
- Assuring long-term funding for the repository will be available over the course of the multi-generational infrastructure project by making portions of previously collected funding accessible to DOE for specific actions at the Yucca Mountain site during specific time periods.

Reponses to Questions for the Record from the Honorable Anthony J. O'Donnell
Commissioner, Maryland Public Service Commission
Chair, NARUC Subcommittee on Nuclear Issues-Waste Disposal
On Behalf of the National Association of Regulatory Utility Commissioners (NARUC)
For the
United States House of Representatives
Committee on Oversight and Government Reform
Subcommittee on the Interior, Energy, and the Environment
Hearing Titled "Examining America's Nuclear Waste Management and Storage"
Held on September 26, 2017

Questions for the Record submitted by Chairman Blake Farenthold

1. **Question: Can you elaborate on the financial burden placed on consumers that have already paid into the Nuclear Waste Fund?**

O'Donnell Answer: The financial burden placed on the consumers varies by State.

Cost of Interim On-Site Storage: In both restructured and traditional electricity markets, all the costs of constructing, decommissioning and ongoing operations, including on-site cooling pools intended for the interim storage of waste, are recovered through rates. Consumers pay those rates.

Cost of Unmet Federal Solution: In 1982, Congress decided that the consumers that benefit from the electricity generated from nuclear generating plants must pay the costs of the federal nuclear waste program in exchange for the Department of Energy (DOE) taking the waste from the pools and disposing the waste in a permanent geologic repository. To fund the development, licensing, construction, and operation of the repository, DOE was given authority to collect annual fees from nuclear power plant operators. That fee was set at one mill (one-tenth of one cent) for each kilowatt hour generated by each plant. The plants were entitled to recover those costs in their electric rates. While the 1 mill fee was suspended in 2013, since 1983, Consumers have invested approximately $47 billion dollars.

Cost of Additional On-Site Storage: Due to the federal government's failure to site, license, construct and begin collecting the nuclear waste for disposal as expected, and as contracted for, by the date required by the Nuclear Waste Policy Act (January 31, 1998), plants were forced to consolidate the waste on site. The cost of "re-racking" the fuel in the spent fuel pools was necessary to keep the nuclear units operating safely until the federal government removes and disposes of the waste. As a result, the nuclear plants began to run out of space in storage pools and had to find alternative storage options. Most opted to construct above ground storage facilities and move waste to dry cask storage on-site. Again, consumers paid through their rates for the costs to build these storage sites, purchase casks, move the fuel from pools to the casks to the storage site, and maintain and secure the new storage facilities.

Cost of the Judgement Fund: Some unanticipated costs associated with the continued storage of nuclear waste from nuclear plants may not necessarily be recoverable in rates. This, coupled with a need for increasing existing on-site storage capacity for operating units, caused the utilities

to sue the federal government for monetary damages caused by the failure of the federal nuclear waste program. Many State regulators supported the utilities legal action. These legal actions have now cost not only ratepayers, but ALL taxpayers over $4.5 billion thus far and that tally grows by about a half billion per year.

b) Question: Is there any financial relief in sight?

O'Donnell Answer: No

Follow up question: Do you have any suggestions for alleviating this burden?

O'Donnell Answer: To help stop the bleeding, we need a decision on a permanent repository quickly. The Nuclear Regulatory Commission (NRC) has issued staff safety evaluation reports that indicate the Yucca Mountain site will work. Congress must allocate funds, and the DOE must actively pursue, expeditious review of the Yucca Mountain license application. Until the NRC issues a decision, based on sound science, as to whether or not the Yucca Mountain site is viable, serious progress is not possible. The prosecution of the license will provide ongoing checks on the urgency for finding another suitable permanent disposal site and on decisions of the costs/benefits associated with any possible interim storage solution.

Questions for the Record submitted by Chairman Blake Farenthold On behalf of Rep. Jody Hice

1. **Question: When the D.C. Circuit ordered the Department of Energy to suspend the collection of the nuclear waste fee, electricity consumers in my home state of Georgia had paid over $862 million into the Nuclear Waste fund. The total $46.7 billion balance in the fund is now generating $1.5 billion in interest annually. I am very pleased that the current Administration plans to use the fund for its intended purpose. Do you believe that the nuclear waste fee should be reinstated and under what condition?**

O'Donnell Answer: In terms of the NWF, given the interest it generates, it is not clear that additional funds would be needed any time soon. In my opinion, any decision to restart the fee must consider the annual interest the fund already generates. However, it seems likely that at some point the fee will need to be reinstated. Before reinstatement can be justified on any grounds, the NRC must complete the review of the Yucca Mountain license application and make a final determination on its suitability.

Moreover, it is crucial before reinstatement, that some mechanism be incorporated into law to avoid current problems with how fees are collected and disbursed today. The provisions in Mr. Shimkus's bill which only allows the government to collect up to 90 percent of what has been appropriated by Congress for that year in fees is a necessary prerequisite to reinstatement.

2. **Question: The courts have found the Department of Energy liable for tens of billions of dollars for on-site storage costs under lawsuits filed by utilities based on DOE's failure to meet the 1998 contractual deadline to begin moving waste from reactor**

sites. As a state commissioner, would the continued reimbursement of these costs be acceptable to you in the long-term, or do you believe that a permanent repository for nuclear waste is still required?

O'Donnell Answer: The fact that taxpayers must continue to fund billions in damages from the Judgement Fund for DOE's partial breach is unconscionable. The costs of securing waste at both operating and retired facilities, of continuing to block other economic uses of non-operating sites because of the presence of stored waste, as well as the transactional costs associated with litigation required for operating plants to access the judgement fund, is a wasteful and inefficient burden on all taxpayers. However, these damages must be paid until DOE meets its legal obligation by accepting the waste AND removing it from retired and operating reactor sites. Moreover, notwithstanding Judgement Fund payments, a permanent repository for nuclear waste is not only necessary, it is required by federal law.

3. **Question: Until the federal government meets its obligation to accept and move spent nuclear fuel from reactor sites, utilities will be forced to store spent fuel on site. Are you convinced that this can be done safely?**

O'Donnell Answer: Yes, it has been done safely for at least 50 years. However, while the waste is being stored safely, on-site storage was never intended to be a long term solution. The long-term safety could become an issue at some point in the future, if the federal government continues to fail in its charge to remove the waste from the plant sites and place it in a permanent repository.

b) Question: How do utilities decide to move fuel out of their storage pools and build "dry cask" storage, and how much does it cost?

O'Donnell Answer: In the late 1970s and early 1980s, the need for alternative storage was recognized as pools at many reactors began to fill up with stored spent fuel. Utilities began looking at options like dry cask storage to increase on-site waste storage capacity. Dry cask storage allows spent fuel that has already been significantly cooled in the spent fuel pool to be stored surrounded by inert gas inside a cask. Each cask is designed to hold 2-6 dozen spent fuel assemblies, depending on the type of assembly. Water and air are removed and the canister is filled with inert gas, and sealed. Because there are different types of dry storage cask system designs, the cost of the systems vary depending on when purchased and when deployed. The cost of adding above ground storage is also impacted by many other factors, including but not limited to, above ground storage capacity (i.e. available acreage), number of casks necessary, location of the above ground storage site, etc. Additionally, federal licensing and safety analysis costs are not an insignificant component of total dry cast storage costs. I have been unable to locate verifiable estimates of average costs for dry cask storage.

ANSWER FROM THE ENERGY COMMUNITIES ALLIANCE
QUESTION FOR THE RECORD FROM CHAIRMAN BLAKE FARENTHOLD
ON BEHALF OF REP. JODY HICE
SUBCOMMITTEE ON INTERIOR, ENERGY AND ENVIRONMENT
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

OCTOBER 24, 2017

Congress is considering legislation to establish a consent-based program for a monitored retrievable storage facility for spent nuclear fuel. Before state and local officials agree to host such a facility, they have to trust that the federal government will actually live up to its obligations. Do you have any suggestions on how the federal government can increase the level of trust that its commitments to these communities will be met?

One of the great challenges in regard to new nuclear policy and facility development is trust. Trust is paramount and an integral part of fairness. Without trust, public acceptance and political support will be difficult to develop and, as importantly, maintain over time. Any potential host community needs to know that its interests, concerns and priorities are being meaningfully considered and will be addressed.

The Energy Communities Alliance (ECA) highlighted the degradation of trust in DOE throughout recent Congressional and Administrative efforts to develop a consent-based siting process. DOE's decision in 2010 to withdraw the Yucca Mountain license application, the effort to terminate the MOX project in South Carolina and the failure to meet cleanup milestones across DOE's nuclear weapons complex, each is an example of a decision that negatively impacted public trust that DOE can manage and dispose of nuclear waste or enter into a legally enforceable consent-based siting agreement.

ECA has eight recommendations that it submitted to DOE over seven (7) years ago for developing a consent-based siting process that can be supported by a local community. Several of ECA's members have volunteered to host nuclear waste disposal activities (Yucca Mountain, Waste Control Specialists, Eddy-Lea Energy Alliance, Carlsbad, Nevada Nuclear Security Site):

1. **Provide Resources to the Community to Educate the Community and State:** As part of a consent-based siting process, Congress/Administration must provide resources and funding for education, outreach, feasibility studies and research and development aspects for waste management and disposal. In addition, DOE must use this funding to assist local governments and communities interested in hosting sites or involved in waste management and disposal missions to educate the local community and hire independent third party scientists and engineers. A local government needs to have a full understanding of the benefits and risks that are associated with siting, constructing, operating and hosting a nuclear waste storage facility.

2. **DOE should develop a list of suitable disposal mediums (salt, granite, etc.) and indicate where they exist to inform potential public interest and feasibility studies.**

3. **DOE should develop an initial list of the types of incentives/compensation the federal government is willing to offer for host communities for taking on this mission.**

4. **DOE must work with local governments to define and identify components of "consent" to host a facility.**

5. **Finish the Yucca Mountain licensing review and modify the Nuclear Waste Policy Act (NWPA) to authorize consideration of alternative sites for interim storage or permanent disposal – including Yucca Mountain – as identified through a consent-based siting process.**

6. **Identify the necessary process – including the order that each step should be accomplished – to move the siting process forward.**

7. **A new entity should be created or DOE program office[1] established to focus solely on implementing the nuclear waste management program**, provided it has clear legislative authority, appropriate autonomy, oversight mechanisms, and access to full, required funding.

8. **DOE, the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA) should begin to develop scientifically based health and environmental standards, model state laws and regulations to guide the siting process.**

In addition, ECA recommends that if tangible progress cannot be made in a timely manner, **the federal government should provide funding to the communities that have become *de facto* interim storage sites for both defense high-level nuclear waste as well as commercial spent nuclear fuel to offset the impacts of storing waste beyond the timeframe originally expected.** This will not only ensure the continued security of nuclear waste stored onsite and support emergency response training, it will demonstrate the federal government understands that it has failed to deliver on its responsibilities and perhaps encourage a real sense of urgency.

Ultimately, a consent-based siting process can be deemed "trustworthy and fair" if a fully informed community volunteers itself to host a nuclear waste facility and chooses to enter into a legally enforceable consent-based agreement.

ECA supports Congressional efforts to address the nation's high-level nuclear waste and spent nuclear fuel. As a push to develop consolidated interim storage moves forward, however, ECA notes it is our policy that any effort to site, construct and operate a interim storage facility must be part of a permanent solution and occur in parallel with efforts to site, construct and operate one or more geologic repositories.

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[1] Previously, DOE's Office of Civilian Radioactive Waste Management (OCRWM) was responsible for disposing of the nation's civilian and military nuclear waste and spent nuclear fuel. However, the office was shutdown in 2010 but could be re-established for this purpose.

In January, ECA will host another meeting of the sites that have proposed to host these sites and will continue to update the committee as we continue to work on these issues.

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October 23, 2017

To: Committee on Oversight and Government Reform
Subcommittee on the Interior, Energy, and Environment
Attention: Kiley N. Bidelman

From: Katie Tubb

Subject: Responses to Questions for the Record of a Hearing held by the Subcommittee on the Interior, Energy, and Environment, September 26, 2017, "Examining America's Nuclear Waste Management and Storage"

Please see below my answers to the questions submitted for the record following the hearing conducted on September 26, 2017 by the Subcommittee on the Interior, Energy, and Environment regarding nuclear waste management in America.

Questions submitted by Chairman Blake Farenthold

1. Looking back at the minimal success the Nuclear Waste Policy Act has had over the last 35 years, do you think Congress has a responsibility to intervene? Why or why not?

Yes. The Nuclear Waste Policy Act has all but failed to develop a coherent nuclear waste management pathway in the US. Nearly every feature of the law has ground to a halt, from Department of Energy (DOE) management, to the selection and licensing of a facility at Yucca Mountain, financing the project through the nuclear waste fee, and Congressional appropriations from the nuclear waste fund. However, this ignores the fundamental problems with the Act, some of which – like appropriations from the nuclear waste fund – were recognized even before the law was passed.

No one benefits in the long term from the current situation. Though the nuclear industry can at least recover its expenses by suing the government (the taxpayer), the current and future nuclear industry faces considerable uncertainty after the past decade of political mismanagement. Communities cannot repurpose shut down nuclear facilities and face pressure from citizen groups concerned about stored nuclear waste at nuclear power plants, which have become *de facto* interim storage sites. Yucca Mountain has become a needling political liability for all three branches of the federal government. Further delay and mismanagement also threaten the prospect of Americans to continue benefitting from a reliable source of electricity that currently provides

almost 20 percent of the electricity Americans use. Nuclear power has little to no future if waste cannot be properly managed and disposed.

Certainly, Congress could approach this challenge by trying to make the Nuclear Waste Policy Act work better. However, there are fundamental flaws with the Act, which misaligns responsibility for waste management. A better approach would be to reevaluate the Nuclear Waste Policy Act to include principles of free enterprise. There are companies and technologies that exist that could provide interim and long-term storage options for the nuclear industry outside of or in addition to Yucca Mountain. Yet DOE management of commercial waste as designed by the Nuclear Waste Policy Act does not incentivize solutions or innovation. Connecting the front end of nuclear power production with the back end of waste management in a properly aligned system bound by market forces will push technology and business forward to generate new solutions.

Recognizing that the past cannot be changed, Congress should move forward to complete the review of a license for Yucca Mountain. But it should also revise the Nuclear Waste Policy Act or introduce new legislation to allow innovation in nuclear waste management options for the future nuclear industry. Such revisions should include industry responsibility for waste management decisions and market pricing. Reportedly, the Nuclear Regulatory Commission (NRC) is currently predisposed not to review alternative long-term options, instead considering the DOE to be the only applicant for waste disposal services. Congress should examine this and if necessary clarify that the NRC may review non-DOE waste management applications should companies request permits.

2. The new administration has seemed keener on addressing the stalemate with Yucca Mountain. Is there anything Congress can do to support their efforts?

Yes. At a bare minimum, Congress must appropriate enough funds to the DOE and the NRC to complete the license review of a long-term nuclear waste repository at Yucca Mountain. Doing so does not constitute an irreversible decision to construct Yucca Mountain. Finishing the review merely allows contentions with the permit to be heard and brings together all of the relevant information for Congress, Nevada, the Trump Administration, and the nuclear industry to make prudent decisions about next steps. Failure to appropriate money to these activities is a choice by default that Yucca Mountain is not suitable, yet a choice made without having given Americans, the nuclear industry, or the executive branch reasons as to why.

3. You mentioned a need for greater work with the state of Nevada in order to get the necessary licensing and approvals to complete Yucca. Given the state's past animosity towards this project, including 218 filed contentions with the NRC, what specifically do you feel would be beneficial with respect to this issue, both in terms of DOE action as well as potential legislative fixes?

I would like to focus particularly on what Congress could do to work with the State of Nevada. First, Congress should appropriate funds to complete the Yucca Mountain licensing process: the State's and others' contentions with the DOE's application should be addressed.

Secondly, the voices of all Nevadans must be heard, including those in the nine counties supporting completion of the licensing process. To this end, I agree with the approach of H.R. 3053 to use amounts in the nuclear waste fund to support local governments in their participation and review during the remainder of the licensing process.

Third, many Nevadans believe a nuclear waste facility at Yucca Mountain is of little value to the state and is instead a major health and safety liability over which the state has no control. Other states have shared these concerns in other waste management activities considered, like siting interim storage and deep borehole facilities. Congress should consider how to turn nuclear waste management into an asset for Nevada.

One way to do this is to give Nevada access to the entirety of the nuclear waste fund and interest accumulated through May 2014 (the last time the nuclear waste fee was collected). The sum total is $38.8 billion with roughly $1.4 billion in annual interest.[1] This could be apportioned out in mandatory annual payments of $1.05 billion in perpetuity or until the fund is depleted. In return, Nevada or an entity approved by the state would agree to take the total volume of commercial nuclear waste generated before May 2014 in a contract with the DOE once a license is approved by the NRC. Under this arrangement, the DOE would not be relieved of its contractual obligations with the nuclear industry, but would be contracting with Nevada (or a state approved entity) to manage existing nuclear waste. In essence, Nevada would have both financial control and regulatory control within the confines of NRC regulations. This would also set Nevada up to accept future waste at a price it determines if the state chooses to do so. It should be noted that Congress should develop a new approach for nuclear waste produced after May 2014, an approach that as mentioned would include industry responsibility and market pricing.

Fourth, it could perhaps go a long way to acknowledge that Congress could and should have approached the 1987 amendment to Nuclear Waste Policy Act (which designated Yucca Mountain alone as the site for a repository should the NRC approve it) differently.

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[1] U.S. Department of Energy, "Audit Report: Department of Energy Nuclear Waste Fund's Fiscal Year 2016 Financial Statement Audit," Office of Inspector General, December 2016, pp. 5, 10, https://energy.gov/sites/prod/files/2016/12/f34/OAI-FS-17-04.pdf

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