

PENDING LEGISLATION

HEARING
BEFORE THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
ONE HUNDRED SEVENTEENTH CONGRESS
SECOND SESSION
ON

S. 3145 S. 3856
S. 3543 S. 4038
S. 3719 S. 4061
S. 3740 S. 4066
S. 3769 S. 4280

—————
JULY 28, 2022
—————



Printed for the use of the
Committee on Energy and Natural Resources

Available via the World Wide Web: <http://www.govinfo.gov>

—————
U.S. GOVERNMENT PUBLISHING OFFICE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

JOE MANCHIN III, West Virginia, *Chairman*

RON WYDEN, Oregon	JOHN BARRASSO, Wyoming
MARIA CANTWELL, Washington	JAMES E. RISCH, Idaho
BERNARD SANDERS, Vermont	MIKE LEE, Utah
MARTIN HEINRICH, New Mexico	STEVE DAINES, Montana
MAZIE K. HIRONO, Hawaii	LISA MURKOWSKI, Alaska
ANGUS S. KING, JR., Maine	JOHN HOEVEN, North Dakota
CATHERINE CORTEZ MASTO, Nevada	JAMES LANKFORD, Oklahoma
MARK KELLY, Arizona	BILL CASSIDY, Louisiana
JOHN W. HICKENLOOPER, Colorado	CINDY HYDE-SMITH, Mississippi
	ROGER MARSHALL, Kansas

RENAE BLACK, *Staff Director*

SAM E. FOWLER, *Chief Counsel*

BRIE VAN CLEVE, *Senior Energy Advisor*

RICHARD M. RUSSELL, *Republican Staff Director*

MATTHEW H. LEGGETT, *Republican Chief Counsel*

JUSTIN MEMMOTT, *Republican Deputy Staff Director for Energy*

CONTENTS

OPENING STATEMENTS

	Page
Heinrich, Hon. Martin, a U.S. Senator from New Mexico	1
Barrasso, Hon. John, Ranking Member and a U.S. Senator from Wyoming	6

WITNESSES

Huff, Hon. Kathryn, Assistant Secretary for Nuclear Energy, U.S. Department of Energy	8
Speakes-Backman, Kelly, Principal Deputy Assistant Secretary, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy	9
Wech, Mike, Administrator and Chief Executive Officer, Southwestern Power Administration, U.S. Department of Energy	19
Navin, Jeff, Director of External Affairs, TerraPower	22
Leuck, Matt, Technical Services Manager, Neste, U.S.	36

ALPHABETICAL LISTING AND APPENDIX MATERIAL SUBMITTED

Air-Conditioning, Heating, and Refrigeration Institute et al.:	
Letter for the Record	55
Alpha Tech Research Corp. et al.:	
Letter for the Record	60
American Association for Laboratory Accreditation:	
Letter for the Record	89
American Fuel and Petrochemical Manufacturers:	
Letter for the Record	91
American Nuclear Society:	
Letter for the Record	62
American Public Power Association and National Rural Electric Cooperative Association:	
Statement for the Record	96
American Trucking Associations et al.:	
Letter for the Record	93
Barrasso, Hon. John:	
Opening Statement	6
Bradley, David:	
Statement for the Record	101
California Air Resources Board and California Energy Commission:	
Letter for the Record	47
Centrus Energy:	
Letter for the Record	64
Clean Fuels Alliance America:	
Letter for the Record	99
Feinstein, Hon. Dianne:	
Statement for the Record	2
Heinrich, Hon. Martin:	
Opening Statement	1
Huff, Hon. Kathryn:	
Opening Statement	8
Written Testimony	11
Responses to Questions for the Record	81

IV

	Page
Leuck, Matt:	
Opening Statement	36
Written Testimony	38
Responses to Questions for the Record	88
Navin, Jeff:	
Opening Statement	22
Written Testimony	24
Responses to Questions for the Record	87
Nuclear Energy Institute:	
Letter for the Record	65
Nuclear Innovation Alliance:	
Letter for the Record	67
Orano USA LLC:	
Letter for the Record	69
Speakes-Backman, Kelly:	
Opening Statement	9
Written Testimony	11
Responses to Questions for the Record	85
TerraPower:	
Letter for the Record	71
Uranium Producers of America:	
Letter for the Record	73
Wech, Mike:	
Opening Statement	19
Written Testimony	20
Western States Petroleum Association and Oregon Fuels Association:	
Letter for the Record	106
X-energy	
Letter for the Record	75

The text for each of the bills that were addressed in this hearing can be found at: <https://www.energy.senate.gov/hearings/2022/7/full-committee-hearing-to-consider-pending-legislation>

PENDING LEGISLATION

THURSDAY, JULY 28, 2022

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The Committee met, pursuant to notice, at 10:05 a.m. in Room SD-366, Dirksen Senate Office Building, Hon. Martin Heinrich, presiding.

OPENING STATEMENT OF HON. MARTIN HEINRICH, U.S. SENATOR FROM NEW MEXICO

Senator HEINRICH. The Committee will come to order. Today, our Committee will hear testimony on ten bills. The bills on the agenda today address a range of topics of concern to this Committee, including energy efficiency, advancing alternative fuel vehicles and renewable fuels, exports of LNG and imports of Russian uranium, and research and development at the Department of Energy into carbon dioxide removal, microelectronics, and fuel for advanced nuclear reactors.

I have a statement of support from Senator Feinstein for the bill that she has co-sponsored with Senator Barrasso, the Renewable Diesel and Sustainable Aviation Fuel Parity Act, that she would like entered into the record, assuming there are no objections.

[Letter of support from Senator Feinstein follows:]

Senator Dianne Feinstein

Statement for the Record: “Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022”

Energy and Natural Resources Committee Hearing
July 28, 2022

Chairman Manchin, Ranking Member Barrasso, and Members of the Energy and Natural Resources Committee, thank you for the opportunity to provide a statement in support of my bill with Ranking Member Barrasso, the “Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022.”

My colleagues on this committee, Senator Daines and Senator Cassidy, have cosponsored our bill, and I appreciate their support.

Our bill would provide incentives to produce more renewable diesel and sustainable aviation fuels here in the United States, and remove regulations that are limiting the

use of renewable diesel in California.

It would also promote the development and deployment of these fuels by requiring the Department of Energy to track foreign imports and domestic production of renewable diesel and sustainable aviation fuel.

Under current Federal Trade Commission regulations, fuel dispensers are required to label diesel fuel blended with renewable diesel with the exact concentration of renewable diesel in concentrations greater than 20 percent by volume.

However, it is not feasible for many operators of fueling stations to determine the exact concentration of renewable diesel that will be dispensed and create a new pump dispenser label for each new fuel delivery. This has prevented the use of higher levels of renewable diesel in California.

In August 2021, the California Air Resources Board and the California Energy Commission wrote to leadership of this Committee, making clear the benefits of renewable diesel and their concerns that Federal Trade Commission labeling requirements are limiting its use in California.

As they explained, California and the nation are losing out on an opportunity to deliver the necessary public health and climate benefits associated with using higher levels of renewable diesel.

As this committee knows, we are already seeing the devastating effects of climate change – especially in California and other western states. Wildfires are becoming more frequent, more destructive, and more deadly as a result of climate change. The eight largest wildfires in California history have occurred since 2017. During that span, wildfire has burned 10 million acres throughout the State, killed nearly 200 people, and destroyed more than 32,000 homes.

We simply must do more to minimize the worst effects of climate change. This bill moves us in the right direction, and I thank the Committee for its consideration and would be pleased to work with you to answer any questions or address any concerns you might have.

Thank you again for calling today's hearing and including the "Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022."

Senator HEINRICH. I would like to highlight two bills in particular that will create new opportunities for families to save substantial money on their household heating and cooling bills, in addition to making a small technical change to the definition of water heaters. S. 4061, introduced by Senators Stabenow, Blackburn, and Hirono, authorizes the Department of Energy to consider doing a rulemaking to set a demand response capability standard for residential electric resistance and heat pump water heaters at the point of manufacture. Demand response is a great tool to enable grid operators and utilities to manage loads to enhance grid security and reliability during high demand periods. According to a recent DOE study on load shifting and the energy efficiency potential of heat pump water heaters in residential buildings, grid-connected heat pumps can reduce evening peak load by as much as 90 percent, relative to electric resistance. This translates to dollars saved for consumers. In fact, converting all electric resistance water heaters to heat pump water heaters would save American consumers \$7.8 billion annually, or about \$182 per household in water heating bills.

The second bill, the Weatherization Assistance Program Improvements Act of 2022, introduced by Senators Reed, Collins, Coons, and Shaheen would authorize funding to ensure that people have the resources they need to make their homes weatherization-ready. As successful as the Weatherization Assistance Program has been, there are significant challenges preventing many households from receiving the weatherization assistance they need, including things like unremediated mold and structural deficiencies. I think it is also worth highlighting the increase in the per-dwelling unit cap from \$6,500 to \$12,000 per household. The higher limit would make it so that homeowners are able to fully weatherize rather than having to pick and choose upgrades. It could also make it easier for people to get their homes ready for things like electrification. I think these reforms have real potential to save families money by lowering their home heating and energy bills, and I look forward to learning more about them from our witnesses today.

With that, I will turn things over to our Ranking Member, Senator Barrasso, for his opening remarks.

**OPENING STATEMENT OF HON. JOHN BARRASSO,
U.S. SENATOR FROM WYOMING**

Senator BARRASSO. Well, thanks so much. Thank you, Mr. Chairman. Thanks for holding today's legislative hearing. I am going to limit my comments to the three bills which I have introduced.

The first is S. 3856, a bill to ban imports of Russian uranium. Earlier this year, Congress signaled its support for banning imports of Russian energy fuels. Our efforts effectively forced President Biden's hand. In March, the President announced that he would ban imports of Russian oil, natural gas, and coal. But President Biden chose not to ban imports of Russian uranium. Russia is currently our fourth largest uranium supplier. Russia's sole nuclear company also accounts for about half of the world's uranium enrichment, and it was founded by President Vladimir Putin. So let's be clear about what this means. By purchasing Russian uranium, we continue to fund Russia's war in Ukraine. If we are seri-

ous about choking off funds to the Russian state and helping the people of Ukraine, then we need to ban imports of Russian uranium. The time for sitting on our hands is over.

The second bill, S. 4066, is a bill to promote the domestic production of high-assay low-enriched uranium. This is a specific type of uranium that will fuel America's advanced reactors. That includes TerraPower's Natrium reactor, which will be built in my home State of Wyoming. It also includes X-energy's reactor, which will be built in Senator Cantwell's home State of Washington. Currently, there are only two sources of high-assay low-enriched uranium. One is Russia. The other is the Department of Energy. My bill would ensure that the companies like TerraPower and X-energy have a domestic source of high-assay low-enriched uranium. Specifically, it would require the Secretary of Energy to produce this fuel from its excess inventories of highly enriched uranium. It would also require the Secretary to make sufficient quantities of high-assay low-enriched uranium available for the initial needs of our advanced reactors. At the same time, the bill would accelerate the commercial availability of this fuel here in the United States. If our advanced reactors are to succeed, we must help them secure the fuel they need here at home in America.

The last bill, Senate bill 4038, is a bill to promote the production and use of renewable diesel and sustainable aviation fuel. Renewable diesel offers among the most promising means to reduce carbon emissions for heavy duty trucks. Likewise, sustainable aviation fuel offers among the most promising means to reduce carbon emission from aircraft. Unlike conventional biodiesel, renewable diesel can meet the same technical specifications as petroleum-based diesel. That means that there are no physical limits to how much renewable diesel can be used in today's engines, fuel pumps, storage tanks, and pipelines. This bill would require the Secretary of Energy to report on the domestic production and foreign imports of renewable diesel and sustainable aviation fuel. That includes the type, volume, and origin of the feedstocks. This bill would also exempt renewable diesel, from outdated and unnecessary labeling requirements. My home State of Wyoming is a leading producer of renewable diesel, and that renewable diesel is used in California. Last year, the California Air Resources Board wrote me explaining that existing labeling requirements are inhibiting the greater use and production of renewable diesel, and this is specifically related to California. The bill that Senator Feinstein and I have introduced would solve that problem and allow California and other states to use much larger volumes of that fuel.

So I want to thank the witnesses for joining us today, and I look forward to the testimony of all of you.

Thank you, Mr. Chairman.

Senator HEINRICH. Thank you, Senator Barrasso.

Now, we will turn to our witnesses for today's hearing.

Dr. Kathryn Huff, Assistant Secretary for Nuclear Energy, U.S. Department of Energy.

Kelly Speakes-Backman, Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy.

Mike Wech, Administrator and Chief Executive Officer of the Southwestern Power Administration.

Jeff Navin, Director of External Affairs, TerraPower.

Matt Leuck, Technical Services Manager at Neste, U.S.

We will start with Dr. Huff. Please proceed.

OPENING STATEMENT OF HON. KATHRYN HUFF, ASSISTANT SECRETARY FOR NUCLEAR ENERGY, U.S. DEPARTMENT OF ENERGY

Dr. HUFF. Thank you, Chairman Heinrich, Ranking Member Barrasso, and members of the Committee. It is an honor to appear before you representing the Department of Energy, along with my colleagues, to discuss the various energy bills under your consideration. I look forward to your questions and will begin my testimony on the legislation relevant to nuclear energy. To meet our ambitious carbon reduction goals and to rebuild U.S. leadership globally, the Biden Administration is prioritizing activities that keep the existing fleet of nuclear power plants operating, deploy advanced reactors, secure and sustain the nuclear fuel cycle, and expand international nuclear energy cooperation.

The Russian Federation's invasion of Ukraine has demonstrated the grave threat to global energy security posed by dependence on Russian-supplied fuels. Russia, the largest global enricher of uranium, currently supplies a significant fraction of the nuclear fuel used by the United States, as well as our international allies and partners. In particular, conversion and enrichment services from trusted sources are not sufficient to replace current imports from Russia. Without expansion of this domestic fuel cycle capacity, the United States cannot securely support the low-enriched uranium needs of today's reactor fleet, or make high-assay LEU (HALEU) available for advanced reactors, research reactors, and medical isotope production. The Department is working to address these energy security challenges in the face of ongoing global events. I want to thank this Committee for your leadership in the development of proposed legislation at tackling this very important issue facing our nation and the world.

S. 3856 bans uranium imports from the Russian Federation. American dependence on Russian uranium threatens our energy security. Untrustworthy state-sponsored programs have no place in our energy policy. However, any uranium import ban must be accompanied by strategic investments that strengthen our domestic nuclear fuel supply chain. Additionally, our nation's current nuclear power operators will need some time to wean ourselves off of this Russian supply.

S. 4066, the Fueling our Nuclear Future Act, would direct the Department to accelerate the commercial availability of HALEU produced in the United States. The Department shares the Committee's concern about HALEU availability. Prior to Russia's invasion of Ukraine, DOE was already working to address HALEU needs for commercial deployment and uranium needs for its other missions. However, given global events, a new and more urgent path is needed. My office is actively addressing this topic in coordination with the National Nuclear Security Administration (NNSA).

On behalf of my colleagues across the Department, I would also like to briefly touch on the other legislation considered today. S. 3740, the Micro Act of 2022, would expand DOE's capacity for early stage research pursuing transformative technologies to advance the micro-electronics industry and reinforce DOE's position as a leader in this field. Microelectronics are essential to the execution of DOE missions in science and engineering, clean energy, energy security, national security, and stewardship of the nation's nuclear stockpile. DOE looks forward to working with the Committee on this legislation.

S. 4280, the Federal Carbon Dioxide Removal Leadership Act, would complement the Regional Direct Air Capture Hubs and other programs included in the Bipartisan Infrastructure Law. The technologies developed and matured by this legislation may eventually be located in one of the four Direct Air Capture Hubs. Furthermore, they likely would leverage geological storage sites that will be developed from BIL provision 40305, Carbon Storage Validation and Testing.

Finally, S. 3145, the Small Scale LNG Access Act of 2021, appears to codify into law a Department of Energy rule that expedites the approval process for facilities that export small scale shipments of LNG. While the Department does not have a position on this particular bill, DOE is ready to provide technical support as needed.

Thank you for the opportunity to appear before the Committee today. I am happy to take your questions.

[The written testimony of Dr. Huff and Ms. Speakes-Backman was submitted as one document. It appears following Ms. Speakes-Backman's opening statement on page 11.]

Senator HEINRICH. Thank you.

We will go to Ms. Speakes-Backman next.

OPENING STATEMENT OF KELLY SPEAKES-BACKMAN, PRINCIPAL DEPUTY ASSISTANT SECRETARY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, U.S. DEPARTMENT OF ENERGY

Ms. SPEAKES-BACKMAN. Thank you, Chairman Heinrich, Ranking Member Barrasso, and members of the Committee. Thank you for the opportunity to testify today. Today, I am going to be testifying on four bills that will address a range of important energy issues across the transportation and building sectors, which are two of the five largest sources of greenhouse gas emissions in our nation. My written testimony provides additional detail of the bills as the Administration continues to examine them.

Senate bill 3543, the Vehicle Innovation Act, would reauthorize and complement the critical work already underway in the EERE's Vehicles Technology and Hydrogen Fuel Cells Offices, to increase innovation efficiency of the transportation sector across road, rail, sea, and air. Reauthorization of this bill is critical due to the role that transportation plays in decarbonizing our economy, which is now the largest share since 2016 of greenhouse gas emissions, according to the EPA. This bill also allows EERE to continue the work that will drive down costs, will improve accessibility, and decrease emissions.

Senate bill 3769, the Weatherization Assistance Program Improvements Act, would assist in making more homes ready to weatherize while increasing the amount of work that can be done on homes receiving assistance from the Weatherization Assistance Program, both of which are consistent with the DOE goals of a more energy-efficient and equitable future.

Senate bill 4061, the water heater bill, aligns the Department's goals of encouraging cost-effective resource conservation and consumer utility bill savings while maintaining product utility, a level playing field for manufacturers, and encouraging grid benefits for utilities.

And finally, Senate bill 4038, the Renewable Diesel and Sustainable Aviation Fuel bill, complements our priorities on sustainable aviation fuels, and DOE supports the updated definitions of sustainable aviation fuels and renewable diesel, as well as the labeling requirements, DOE authorizations, and EIA data collection and reporting requirements. We have really ambitious but achievable SAF goals that require flexibility to work across all feedstocks. So accordingly, we recommend that this bill strike the language excluding municipal solid waste and gas derived from the biodegradation of municipal solid waste from the definition of biomass.

So EERE looks forward to working with the Committee on this legislation and other important issues as the U.S. transitions to a clean energy economy. I appreciate the ongoing, bipartisan efforts to address our nation's energy challenges, and I look forward to your questions.

[The jointly prepared statement of Dr. Huff and Ms. Speakes-Backman follows:]

Testimony of Dr. Kathryn Huff
Assistant Secretary for Nuclear Energy
and
Ms. Kelly Speakes-Backman
Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy

U.S. Department of Energy
Before the Committee on Energy and Natural Resources
U.S. Senate
July 28, 2022

Introduction

Thank you, Chairman Manchin, Ranking Member Barrasso, and distinguished Members of the Committee. It is an honor for us to appear before you today and represent the Department of Energy (DOE) at this hearing related to the various energy bills under consideration. Our written testimony addresses the Department's view on all the bills under consideration at this hearing. However, this morning we will speak to the legislation under our respective purviews, nuclear energy and energy efficiency and renewable energy, under consideration today by the Committee.

Nuclear Energy

The Administration's climate policy is informed by science, and the science tells us that the time for climate action is now. Nuclear energy is a key element of President Biden's plan to put the United States on a path to a net-zero carbon future by 2050. The United States pioneered the development of nuclear power to produce electricity in the late 1940s. Since then, U.S. leadership in nuclear energy technology has given us the benefit of carbon-free, reliable electricity for seven decades. In the United States, nuclear energy provides about 20% of our electricity and 50% of the nation's annual carbon-free electricity production, making it the largest and the most reliable source of carbon-free electricity, operating with an average 92% capacity factor, the highest in the world for nuclear generation and higher than any other generation source.

To meet our ambitious carbon reduction goals and rebuild U.S. leadership globally, the Biden-Harris Administration is prioritizing activities that keep the existing fleet of nuclear power plants in operation, deploy advanced reactor technologies, secure and sustain the nuclear fuel supply, and expand international nuclear energy cooperation. Nuclear energy will play a major role in the transition to a carbon-free energy economy by fundamentally underpinning our nation's target for carbon-free electricity as well as non-electric energy markets. New nuclear reactor deployments also have the potential to decarbonize many industrial sectors in the United States

and abroad. Ensuring this future for our nation and our allies must include a secure source of fuel for today's nuclear power plants and those of tomorrow.

The Russian Federation's further invasion of Ukraine has demonstrated the grave threat to global energy security posed by dependence on Russian-supplied fuels. Russia, the largest global enricher of uranium, currently supplies a significant fraction of the nuclear fuel supply chain to the United States and our international allies and partners. In particular, conversion and enrichment services from trusted sources are insufficient to replace current imports from Russia. Without expansion of the domestic fuel cycle capacity, the United States cannot securely support the low enriched uranium (LEU) needs of today's reactor fleet or make high-assay LEU (HALEU) available for advanced reactors, research reactors, and medical isotope production.

The Department is working to address these energy security challenges in the face of ongoing global events. I want to thank this Committee for your leadership in the development of proposed legislation aimed at tackling this very important issue facing our nation and the world.

As you know, there is no quick, easy path to reduce our dependence on Russian-supplied fuels. Expanding our domestic fuel capacity will require a significant strategic investment coupled with import policies that protect those investments well into the future.

S. 3856 – A bill to prohibit the importation of uranium from the Russian Federation (Barrasso et al)

S. 3856, a bill to prohibit the importation of uranium from the Russian Federation, bans the import of uranium from the Russian Federation.

American dependence on Russian uranium threatens our energy security. Energy security is national security and untrustworthy state-sponsored programs have no place in our energy policy. However, any uranium ban from the Russian Federation must be accompanied by strategic investments that strengthen our domestic nuclear fuel supply chain.

While a ban coupled with long-term assurances would provide long-term predictability that would de-risk investments in the domestic nuclear fuel supply chain, our nation's current nuclear power operators will need some time to wean themselves off this Russian supply. In the Presidential Proclamation that prohibits Russian-affiliated vessels from entering into U.S. ports, the Department was provided a method to exempt Russian-affiliated vessels transporting source, special nuclear, and by-product material, for such time, as the Secretary of Energy, in consultation with the Secretary of State and the Secretary of Commerce, determines that no viable source of supply is available that would not require transport on Russian-affiliated vessels. A similar exception to a ban on uranium and fuel services from the Russian Federation would be needed while new capacity is developed to ensure our nuclear power plants continue to generate carbon-free electricity.

S. 4066 – Fueling our Nuclear Future Act of 2022 (Barrasso HALEU bill)

S. 4066, the Fueling our Nuclear Future Act, would direct the Department of Energy to establish a program to accelerate the availability of commercially produced HALEU in the United States.

It would also direct DOE to make HALEU available from our inventories for advanced reactors until U.S. commercial enrichment is available.

DOE is supporting the development of two advanced reactor demonstrations that will require HALEU fuel. These Advanced Reactor Demonstration Program awardees have aggressive timelines for deployment. At DOE, we are working diligently to meet awardees' HALEU needs, which may be as early as 2025 for reactors that may go online as early as 2028.

The Department shares the Committee's concern about HALEU availability, and it is a topic that DOE's Office of Nuclear Energy (NE) is actively addressing, in coordination with the Environmental Management program and the National Nuclear Security Administration (NNSA), given the importance to our domestic industry and national security.

Prior to Russia's further invasion of Ukraine, the Department was already working to address HALEU needs for commercial deployment and uranium needs for its other missions. However, given global events, a new and more urgent path is needed. The Department recently issued a request for proposal for a competitively awarded cost share procurement to complete construction and operate the centrifuge cascade at Piketon, Ohio, with options to continue to operate the cascade subject to appropriations.

The President's Fiscal Year 2023 budget request proposes to make available small quantities of HALEU from limited DOE inventories and support the private sector in establishing a limited U.S. commercial HALEU production and supply chain capability. The Department's highest priority for its enriched uranium inventories has been and will remain NNSA's national security missions. The Department will ensure that any material provided will not impinge on those missions.

This includes the recovery and down-blending of material stored at Y-12 and Savannah River in a cost share program between NE and NNSA and producing HALEU material in the 2025-2026 timeframe. It would also support completing construction of the enrichment demonstration facility in Piketon, Ohio, and continued operation of the centrifuge cascade at Piketon, Ohio, to produce 900kg HALEU per year, enriched to a nominal 19.75% U-235.

The Department is concerned that the bill would eliminate consideration of potential harm to the natural or cultural resources of Tribal communities or sovereign Native Nations. I look forward to working together with you toward investments that secure our supplies of low enriched uranium (LEU), including HALEU, in a just and equitable manner.

Energy Efficiency and Renewable Energy

The Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) program's primary focus is on funding technology research, development, demonstration and deployment (RDD&D) through competitive solicitations open to the public and through support for the National Laboratories, which play a central role in advancing America's leadership in science and technology and developing innovative solutions to decarbonize our economy equitably and affordably for all. Additionally, academic institutions, such as universities and

colleges, are a resource for innovation, R&D, and training sponsored by EERE. The knowledge generated by EERE research, development, demonstration, and deployment drives down the costs of new technologies, supporting the efforts of U.S. industries, businesses, and entrepreneurs to commercialize, manufacture and deploy innovative energy technologies. These technologies also reduce harmful emissions that disproportionately affect lower income and minority populations.

Work across EERE's portfolio of sustainable transportation, renewable power, energy efficiency programs demonstrate how we can use new technologies and strategies to expand access to clean energy and transportation in underserved communities and support a range of programs that provide workforce development and equitable access. We plan to continue to build on these efforts moving forward and ensure a just, equitable transition to a clean energy future is a cornerstone of DOE and EERE's mission and work.

Climate change is one of the greatest challenges facing our nation and our planet today. DOE is working to address the climate emergency and lead through the power of example, by issuing funding and supporting policies to help ensure that the U.S. builds a 100% clean energy economy and reaches net-zero emissions no later than 2050, which is essential if we are to avoid the worst impacts of climate change. We must also ensure that the benefits from a clean energy future are equitably shared by all Americans, from clean air to good-paying jobs, from farmers to factory workers and from cities to the rural economy.

The Committee is considering five bills today that address a range of important energy issues across the transportation and buildings sectors, two of the five largest sources of greenhouse gas emissions in the U.S. today. The Administration continues to review each of these bills. We appreciate the ongoing bipartisan efforts to address our Nation's energy challenges, and the Department looks forward to working with the Committee.

S. 3543 -- Vehicle Innovation Act of 2022 (Peters, Hagerty, Stabenow)

This bill authorizes through FY2027 the Department of Energy (DOE) to research, develop, demonstrate, and commercialize innovative vehicle technologies. Reauthorization of this bill is needed to consolidate and update authorities. This bill would reauthorize and complement the critical work already underway in EERE's Vehicle Technologies and Hydrogen and Fuel Cells Technologies Offices to increase innovation and increase the efficiency of transportation, and the Department looks forward to continuing to work with the committee to advance mutual goals of transportation innovation.

The transportation sector accounts for the largest share of greenhouse gas emissions (33%) and is the second highest expenditure for U.S. households. The work authorized under this bill could assist DOE's work to continue driving down costs, improving accessibility, and reducing emissions produced by the transportation sector. EERE recognizes that to decarbonize transportation, we need to invest in innovation across all modes of transportation (light-, medium-, heavy-duty, marine, aviation, rail). EERE is currently working on all modes and feels it is important that the act recognize and acknowledge the role that all modes play in working towards overall transportation decarbonization.

S. 3769--Weatherization Assistance Program Improvements Act of 2022 (Reed, Collins, Coons, Shaheen)

This bill establishes a Weatherization Readiness program with \$65M appropriated for work, FY23-FY27. In addition, the legislation increases the Average Cost Per Unit (ACPU) to \$12,000 under the Weatherization Assistance Program and allows the Secretary to determine if additional increases in ACPU is necessary due to market conditions. The bill also addresses issues from the WAP Reauthorization, Energy Act of 2020, by correcting the reweatherization date language to allow for braiding of multiple funding sources in a home. Furthermore, the legislation increases the statutory limit for renewable energy systems under the Weatherization Assistance Program to \$6,000.

This bill would assist in making more homes ready to weatherize while increasing the amount of work that can be done on homes receiving assistance from the Weatherization Assistance Program and gives the Department flexibility to issue further increases if needed. These outcomes are consistent with DOE goals of a more energy efficient and equitable future.

S. 4038 – Renewable Diesel/Sustainable Aviation Fuel (Barrasso/Feinstein/Cassidy/Lujan/Daines)

This bill limits the definition of sustainable aviation fuels (SAF) to those that conform to the methodology contained in the Clean Air Act or the most recent Carbon Offsetting and Reduction Scheme for International Aviation, as adopted by International Civil Aviation Organization with the support of the United States. The proposed legislation amends DOE's authorizations to clarify that DOE is authorized to a) conduct R&D on regenerative farming practices within the Bioenergy research program and b) provide loan guarantees to facilities that produce biofuels from a range of biomass and waste feedstocks (excluding palm oil). The bill also updates labeling requirements for renewable diesel and renewable diesel blends and requires Energy Information Administration (EIA) to track and report data related to the production of renewable diesel and SAF.

Work on SAF will be critical to achieving the USG goals for decarbonizing aviation fuel and is a critical part of EERE's overall transportation decarbonization strategy. The Department supports the updated definition of SAF and requiring that it has at 50% lower lifecycle greenhouse gas emissions than petroleum jet fuel. However, there are SAF production strategies that could achieve significantly lower lifecycle emissions—net-zero emission, and even *net-negative* emission fuels are possible. To achieve the aggressive but achievable goals set for SAF, EERE needs flexibility to work on all available feedstocks, including municipal solid waste (MSW). We recommend that this authorization include an update the current language in the Bioenergy Program that restricts research on MSW and landfill gas. Specifically, we recommend striking the language below:

“...but not including municipal solid waste, gas derived from the biodegradation of municipal solid waste..”

This bill would complement DOE's Bioenergy Technologies priorities on sustainable aviation fuels. It would update definitions of sustainable aviation fuels and renewable diesel, as well as

the labeling requirements, DOE authorizations and EIA data collection and reporting requirements related to these fuels.

S. 4061 – Water heater bill (Blackburn/Stabenow/Hirono)

This bill provides an exclusion for certain categories of water heaters that the draft legislation is defining as intended exclusively for commercial use, but that are currently regulated as consumer products under the Energy Policy and Conservation Act (EPCA). The bill establishes criteria that define those water heaters that should be “excluded” from the consumer part of EPCA and regulated as commercial equipment allowing DOE to regulate them using commercial test procedures, metrics, and associated energy efficiency standards. The bill sets forth a backstop provision if the shipments increase by 25% and requires compliance with the consumer regulations within one year if evidence from the market in terms of shipments shows they are being purchased for and installed in residences.

The bill also adds a new category of water heaters referred to as “multi-input electric storage water heater,” which are defined as a non-heat pump electric storage which can have multiple configurations at, above, or below 12kw. The legislation specifies that multi-input electric storage water heaters would be subject to the test procedures and standards for both consumer and commercial water heaters because they are offered in multiple markets allowing them to compete in both marketplaces equitably.

In addition, the legislation allows DOE to consider demand response requirements for water heaters if certain conditions are met, which acknowledges the potential grid-benefits of thermal storage capacity from water heaters. More specifically, the legislation requires DOE to consider setting standards for demand response based on the statutory criteria for promulgation of a rulemaking. In setting such standards, DOE is required to consider industry consensus standards, such as Air-Conditioning, Heating, and Refrigeration Institute (AHRI) 1430, as part of its test procedure and metric. The legislation addresses preemption from State standards if DOE moves forward with Federal standards, including an allowance for those State standards already in effect such as California, Washington, and Oregon, and future Federal harmonization.

The bill aligns with the Department’s goals of encouraging cost-effective resource conservation and consumer utility bill savings, while maintaining product utility, a level playing field for manufacturers, and encouraging grid benefits for utilities. We look forward to continuing to work with the committee to advance mutual goals on appliances and equipment efficiency, especially in the area of water heating.

Other DOE Bills

S. 3145 – Small LNG (Cassidy et al) (FECM)

S. 3145 appears similar to the rule on small-scale natural gas exports finalized by DOE in 2018. The Administration does not have a position on S.3145, but DOE offers the following observations:

Similar to S.3145, DOE's rule on small scale exports allows for expedited treatment of applications to export of up to 51.75 billion cubic feet of natural gas per year (bcf/y). DOE's rule was designed to help facilitate exports to smaller markets.

To date, DOE has granted five applications under the rule on small-scale exports. In the applications processed to date, there has been a combination of approaches where some applicants sought to source LNG from existing small-scale facilities that they owned or were otherwise affiliated with, and some applicants sought to export volumes of LNG that would be sourced from one or more small- and large-scale LNG facilities that they were not affiliated with.

Should S.3145 be codified, DOE would be ready to provide technical support as needed.

Some parameters of the DOE rule on small scale exports have helped to assure that authorizations issued under the rule to date are not mis-used. For instance, DOE does not allow a single applicant to have multiple authorizations under the rule on small scale exports because if combined may enable the applicant to achieve a volume of export above 51.75 bcf/y. Additionally, DOE has clarified that approval of small-scale exports cannot serve as authority to exceed a liquefaction facility's authorized capacity; several of the small-scale applicants have requested to source volumes from one or more facilities that have received authorizations to site, construct, and operate liquefaction facilities from the Federal Energy Regulatory Commission (FERC). In those instances, DOE has clarified that authorizations under the small-scale rule cannot allow the FERC-authorized capacities of the liquefaction facilities that may be the source of the small volume exports to be exceeded.

DOE looks forward to working with the sponsors of S.3145.

S. 3740—Micro Act of 2022 (Kelly/Blackburn)

The microelectronics industry faces formidable challenges as it approaches fundamental limits of today's manufacturing technologies, and new technology pathways are needed to enable the next generation of semiconductor manufacturing and products. These challenges, in turn, pose challenges to DOE, which both relies on state-of-the-art microelectronics to pursue its mission and plays an important role in maintaining American microelectronics leadership through support for leading-edge R&D. The Micro Act of 2022 would expand DOE's capacity for early-stage research in pursuit of some of the most transformative technologies to advance the microelectronics industry and reinforce DOE's position as a leader in this field.

DOE's microelectronics efforts seek to advance the state-of-the-art for future sensors, detectors, wired or wireless communications, control, and computing technologies that are critical for national priorities in science, energy efficiency, clean energy, and national security. To this end, the Department's activities span the RDD&D continuum—from the development of novel materials and technologies to prototyping and commercialization of these technologies in the private sector. The national laboratories, Office of Science user facilities, and National Nuclear Security Administration (NNSA) facilities provide the most advanced tools for scientific research, as well as intellectual property and technical expertise in microelectronics. In addition, the increased focus on DOE programs to drive demonstration, deployment, commercialization

(including loan programs), and manufacturing scale-up, are key to enabling greater U.S. competitiveness. And even beyond its role in RDD&D, DOE is an important consumer of the most advanced microelectronics technologies with the world's most advanced high-performance computing systems. Microelectronics are essential to the execution of DOE missions in science and engineering, clean energy and energy security, national security, and for stewardship of the Nation's nuclear stockpile.

Building the U.S. semiconductor R&D and industry ecosystem of the future requires an interdisciplinary approach to R&D, manufacturing, and commercial deployment, involving communication between disparate parts of the value chain. Likewise, as wide bandgap devices are increasingly incorporated into systems with electronics controls, a multidisciplinary research ecosystem must evolve to ensure understanding, performance, reliability, and safety. DOE is uniquely positioned to engage the entire value chain and has a strong role to play at this nexus. With the broad range of capabilities and opportunities that DOE brings to the microelectronics space, we expect the Department to remain a hub for realizing the Nation's microelectronics competitiveness in the years to come.

S.4280 – Federal Carbon Dioxide Removal Leadership Act of 2022 (Coons, Whitehouse)
(FECM)

S.4280 “Federal Carbon Dioxide Removal Leadership Act of 2022” complements provision 40308- Regional Direct Air Capture Hubs passed under the Bipartisan Infrastructure Law and also provisions 41005a and 41005b for both Precommercial and Commercial Prizes for Direct Air Capture technologies. The technologies that are developed and matured by S4280 may eventually be located in one of the four Direct Air Capture Hubs that are envisioned by BIL provision 40308. Furthermore, the technologies from S4280 likely may leverage geological storage sites that will be developed from BIL provision 40305- Carbon Storage Validation and Testing.

Conclusion

Thank you for the opportunity to appear before the Committee today. We look forward to working with you to provide American families and businesses with a wider range of energy and mobility options that offer more affordability, reliability, and security of our nation's energy.

We look forward to your questions.

Senator HEINRICH. All right.
Administrator Wech.

**OPENING STATEMENT OF MIKE WECH, ADMINISTRATOR AND
CHIEF EXECUTIVE OFFICER, SOUTHWESTERN POWER AD-
MINISTRATION, U.S. DEPARTMENT OF ENERGY**

Mr. WECH. Good morning, Chairman Heinrich, Ranking Member Barrasso, and distinguished members of the Committee. Thank you for the opportunity to appear before you today to represent Southwestern Power Administration and the Department of Energy regarding legislation to establish the Southwestern Power Administration Fund, currently under consideration as S.3719 by your Committee.

By way of introduction, Southwestern is a power marketing administration that serves over ten million end-users in the heartland of the nation. As a federal utility, we have a statutory mission to market and deliver electricity from 24 federal hydroelectric generating plants operated by the U.S. Army Corps of Engineers. In our nearly 80 years in business, we have done just that and more in meeting our statutory and contractual obligations while also providing grid stability and voltage support for both the regional—and ultimately, the national—bulk electric system when severe weather events and other disasters strike. We take great pride in providing the sustainable hydropower product we market and deliver. Our stewardship of the reservoirs and river systems within our marketing areas is carefully balanced with flood risk mitigation and other uses so that we can meet the power needs of our customers. However, because these projects we market from are almost entirely dependent upon rainfall, extended dry periods mean that we must purchase replacement power and energy to meet our contractual obligations. With market conditions being tight, this replacement power can get very expensive.

S.3719 authorizes a change specific to the funding structure of Southwestern which supports end-users in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas. The bill establishes the Southwestern Power Administration Fund, a permanent self-financing revolving fund supplied through Southwestern's power sales receipts, with no annual appropriations. The intent of the Southwestern Power Administration Fund will provide for continued infrastructure investment for maintenance and operations of our transmission assets without appropriations, will perform full cost recovery for the government, and it is a proactive, proven model of good financial stewardship, fully supported by Southwestern's customers. No mission or function changes to Southwestern's program are proposed. All program costs would continue to be recovered in our power rates to our customers.

I do want to note, however, while Congressional Budget Office rules will result in a score for this fund, there is no taxpayer burden, as our customers will continue to repay costs associated with Southwestern's program. Mr. Chairman, this concludes my testimony. I would be pleased to address any questions that you or the Committee members may have.

[The prepared statement of Mr. Wech follows:]

**Testimony of Mike Wech
Administrator, Southwestern Power Administration
U.S. Department of Energy
Before the Committee on Energy and Natural Resources
U.S. Senate
July 28, 2022**

Chairman Manchin, Ranking Member Barrasso, and distinguished Members of the Committee, thank you for the opportunity to appear before you today to represent Southwestern Power Administration (Southwestern) and the Department of Energy (DOE) regarding legislation to establish the “Southwestern Power Administration Fund,” currently under consideration as S. 3719 by your Committee.

By way of introduction, Southwestern is a Power Marketing Administration that serves over ten million end-use customers in the heartland of the Nation. As a Federal utility, we have a statutory mission to market and deliver electricity from 24 Federal hydroelectric generating plants operated by the U. S. Army Corps of Engineers.

In our nearly 80 years in business, we have done just that and more, meeting our statutory and contractual obligations while also providing grid stability and voltage support for the regional and ultimately the national bulk electric system when severe weather events and other disasters strike.

We take great pride in providing the sustainable hydropower product we market and deliver. Our stewardship of the reservoirs and river systems within our marketing area is carefully balanced with flood risk mitigation and other uses so that we can reliably meet the power needs of our customers. However, because the projects we market from are almost entirely dependent on rainfall, extended dry periods mean Southwestern must purchase replacement power and energy to meet our contractual obligations. When market conditions are tight, this replacement power can get expensive.

Bill S. 3719 authorizes a change specific to the funding structure of Southwestern which supports end users in: Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas. The bill establishes the Southwestern Power Administration Fund, a permanent, self-financed revolving fund supplied through Southwestern’s power sales receipts – with no annual appropriations.

The intent is that the Southwestern Power Administration Fund will provide for continued infrastructure investment for maintenance and operations of the transmission assets without appropriations; full cost recovery for the Government; and a proactive, proven model of good financial stewardship fully supported by Southwestern’s customers. No mission or function changes to Southwestern’s program are proposed. All program costs would continue to be

recovered in power rates. We do note that, despite this, the legislation would likely have a budgetary score due to scoring methodologies, which would impact the deficit.

Mr. Chairman, this concludes my testimony. I would be pleased to address any questions that you or the Members of the Committee may have.

Senator HEINRICH. Thank you very much.
Mr. Navin.

**OPENING STATEMENT OF JEFF NAVIN,
DIRECTOR OF EXTERNAL AFFAIRS, TERRAPOWER**

Mr. NAVIN. Thank you, Chairman Heinrich, Ranking Member Barrasso, and members of the Committee. My name is Jeff Navin, and I am the Director of External Affairs for TerraPower. TerraPower is an advanced nuclear company based in Bellevue, Washington. We were founded by Bill Gates and others in 2008 to solve the dual challenges of global energy poverty and climate change. We are building the Natrium project at the site of a coal plant slated to be retired, just outside of Kemmerer, Wyoming, as part of the DOE's Advanced Reactor Demonstration Program. Per the terms of the ARDP, we plan to bring our reactor online in 2028 at a 50/50 federal/private cost share.

Natrium differs from conventional reactors in three important ways. First, is the way that we cool our reactor. Conventional nuclear reactors are cooled by water, which has a relatively low boiling point. This requires a combination of pressurization and redundant pumps to ensure that the hot water is removed from the core to avoid a loss of coolant. Natrium uses sodium as a coolant. Sodium's boiling point is 882 degrees Celsius, far above our reactors' operating temperature. So our system is inherently safe through the use of physics and natural convection, which allows Natrium's design to be less complex and less expensive, with higher levels of safety.

Secondly, the Natrium reactor is much smaller. Our reactor's baseload capacity is 345 megawatts, roughly a third of the size of a conventional plant, making it cheaper to buy and ideally sized to replace generation at fossil fuel plants that are slated to be retired, just like we are doing in Kemmerer. And finally, instead of directly producing power by generating steam from the reactor core, the Natrium plant uses the heat from our reactor to power a molten salt energy storage system that allows us to store 500 megawatts of electricity for up to five and a half hours. That is a gigawatt-scale energy storage—much larger than any lithium-ion battery storage system currently operating in the world, and a game changer for grids with high penetrations of wind and solar.

So Natrium can provide carbon-free, reliable baseload power and can store more energy than any lithium-ion battery storage project in the world, and we are seeing states like West Virginia repeal their bans on new nuclear plants and now, especially, countries in Central and Eastern Europe are looking for alternatives to Russian natural gas, and Natrium can meet that need. But all nuclear reactors need fuel. And Natrium, like most of the advanced reactors designed, as Dr. Huff mentioned, requires a special fuel called high-assay low-enriched uranium, or HALEU. Today, the only source of commercially available HALEU is Russia. With DOE's blessing, we initially planned to use HALEU from Russia for our initial core load while the Department stood up the Advanced Nuclear Fuel Availability Program to establish domestic HALEU enrichment capabilities. And while we are still waiting for the Advanced Nuclear Fuel Availability Program to be launched, and you know, timing-

wise, the ARDP awards were actually made ten months after that was signed into law—the law that authorized that. Today is actually the 18-month anniversary of the Advanced Nuclear Fuels Act being signed into law, and we are still waiting for the RFP to come from the Department to make that program available. But even if that program were launched today, it will take years to get to the point where we are manufacturing the volumes of HALEU that we will need to fuel our reactors.

And so, we are looking for the alternatives. And the only alternative to non-Russian HALEU is, as Senator Barrasso mentioned, is to down-blend highly enriched uranium from the Department of Energy stockpile. So the DOE and the NNSA are earnestly looking for excess HEU that can be down-blended into HALEU. To date, the volumes that they have identified are below what is needed to fuel the two ARDP projects' initial cores, and they also have some capacity issues in their ability to down-blend. But to be clear, HEU down-blending may be the only way we can get our initial cores, but we will also need a fully functional, fully funded Advanced Fuel Availability Program for our subsequent cores, and the bills being considered today directly address these concerns.

First, S. 4066, the Fueling the Nuclear Future Act of 2022, recognizes the critical and urgent need for domestic HALEU enrichment capabilities, and looks to down-blending of HEU from the DOE stockpile to meet the needs of the ARDP initial cores, and it addresses all of the issues that I have mentioned in my testimony. Secondly, S. 3856 prohibits the importation of Russian uranium. TerraPower will not use Russian HALEU, but that means we will need a domestic source. So it is appropriate that the Committee is considering both S. 3856 and S. 4066 together.

So finally, just let me express my sincere appreciation for all the Committee has done to support advanced nuclear power—the Advanced Reactor Demonstration Program and the Advanced Nuclear Fuel Availability Program exist because of the bipartisan work of this Committee. And so, I thank you again for the invitation and I look forward to your questions.

[The prepared statement of Mr. Navin follows:]

Jeff Navin, Director of External Affairs
TerraPower

United States Senate
Committee on Energy and Natural Resources

Hearing to Consider Pending Legislation

July 28, 2022

Thank you, Chairman Manchin, Ranking Member Barrasso, and members of the Committee, for allowing me to be here today. My name is Jeff Navin and I am the Director of External Affairs for TerraPower, the advanced nuclear company that will be developing the Natrium™ project in Kemmerer, Wyoming in partnership with the United States Department of Energy and PacifiCorp/Rocky Mountain Power, near a coal plant slated to be retired.

Previously, I served in the Department of Energy as the Acting Chief of Staff and Deputy Chief of Staff, as well as in positions in the House of Representatives and the United States Senate. I have followed this Committee's work for many years, and I appreciate that it continues to work in a bipartisan manner to address the important energy issues facing our country.

Advanced nuclear is one of those issues that is broadly supported by both Democrats and Republicans. The Natrium project in Wyoming is a public-private partnership made possible by the Advanced Reactor Demonstration Program (ARDP), created by Congress in 2019. We are grateful for the work the Committee has done in creating and continuing to support the ARDP.

To date, TerraPower has met our key milestones in developing the Natrium reactor. But the success of our project, and our ability to build subsequent plants here and across the globe, is threatened by a lack of fuel needed for advanced reactors. A critical disruption in our supply chain caused by the Russian invasion of Ukraine has highlighted the importance of building out domestic enrichment capabilities to power this next generation of carbon-free energy. We are grateful the Committee is working to address this issue.

TerraPower: Who We Are

TerraPower was created in 2008, two years after our company's founders - Bill Gates and Nathan Myhrvold – began looking for a technological solution to the dual challenges of the growing global demand for energy and the need to reduce emissions. A key tool, they discovered, is advanced nuclear technology.

The mission of advanced nuclear energy companies like TerraPower is to improve nuclear energy technology on several fronts, using the capabilities offered by 21st century advancements and digital modeling unavailable to previous generations of engineers and scientists. Advanced nuclear technologies move well beyond our country's 20th Century fleet of light water reactors, including safety improvements, reductions in the risk of weapons proliferation, minimization of waste production, more efficient use of uranium supplies, and lower costs.

Sodium and the Advanced Reactor Demonstration Program

When TerraPower initially began its work, the United States did not have a program supporting the demonstration of advanced nuclear reactors. That changed when Congress, with leadership provided by this committee, created the Advanced Reactor Demonstration Program, which cleared a path to demonstrate this important technology here in the United States.

In 2020, TerraPower competed for, and was selected for an award through the ARDP to demonstrate our Sodium technology, which we developed with GE-Hitachi. Under this program, we will develop our reactor in a public-private partnership with the US Department of Energy. Under the terms created by Congress, DOE is funding up to 50% of the cost of the project. TerraPower is responsible for privately funding the remaining 50% and managing the project. Once the plant is

built, our utility partner – PacifiCorp/Rocky Mountain Power – will own and operate the plant as part of its energy generation fleet. The language enacted by Congress requires our ARDP reactor to be operational by 2028.

As the committee knows, the existing conventional fleet has provided carbon-free, safe, and reliable electricity in the United States for decades. Conventional reactors are large – often more than 1,000MW in capacity. They generate electricity by creating heat from nuclear fission and use that heat to make steam and spin a turbine to generate electricity. Because the heat generated by fission can stress fuel rods and the reactor core itself, reactors require coolants to remove the heat from the reactor. Natrium’s technology provides step change improvements over conventional designs and differs from existing reactors in three important ways.

First, is the way Natrium’s reactor core is cooled. Today, every nuclear reactor producing electricity in the United States is cooled by water. While water has several properties that make it useful as a coolant, it has a relatively low boiling point, and steps must be taken to ensure that the water does not boil off, exposing the core and leading to a meltdown. Those steps can include pressurizing the water to raise its boiling point and using pumps to circulate cool water over the core and remove heat. If those pumps stop operating, as was the case in Fukushima, the coolant will boil off and the fuel rods within the reactor core will melt, damaging the reactor core and leading to a release in radiation. Preventing the fuel from boiling off of the reactor core is the primary safety mission of today’s conventional reactors. That’s why the existing fleet has multiple redundant safety systems to ensure that the pumps never stop pumping water over the core.

The Natrium reactor, on the other hand, uses sodium as a coolant. Sodium is a metal and a solid at room temperature. When heated, it

becomes a liquid, and sodium's boiling point is 882 degrees Celsius – far above the temperature at which our reactor operates. As a result, our reactor's coolant will not boil off. Our fuel rods sit in a pool of molten sodium, and our reactor uses natural convection and air circulation to remove heat from the reactor core. Natrium's reactor operates at atmospheric pressure and does not require auxiliary pumps and backup power in the event of an unplanned incident. Our system is designed to be inherently safe through the use of physics and natural convection, which allows Natrium's design to be less complex and less expensive, with higher levels of safety, than conventional designs.

Secondly, the Natrium reactor is much smaller than conventional reactors. Our reactor's baseload capacity is 345MWe, roughly a third of the size of a conventional plant. This means that the price for a utility to deploy our reactor is far less than the price of deploying a large, water-cooled reactor. Due to its smaller size and enhanced safety profile, the Natrium plant uses far less land than conventional reactors and can easily be placed – like our first plant – at the site of coal plants that are retiring. This allows us to utilize the workforce at those plants, as well as their transmission and water infrastructure, and replace the generation lost when those plants retire.

And finally, the Natrium plant is unique in how it produces power and stores energy. As previously noted, every commercial nuclear reactor in the United States uses the heat generated from the reactor core to generate steam and spin a turbine. Our design is different, as the Natrium plant uses the heat from our reactor to power a molten salt storage system that allows us to store 500MWe of power for five and a half hours – gigawatt scale energy storage – much larger than any lithium-ion battery storage system currently operating in the world, and a game changer for grids with high penetrations of wind and solar. The Natrium plant uses the same technology for molten salt energy storage currently used by concentrated solar plants, allowing us to use off-the-

shelf technology to store massive amounts of clean energy that can be dispatched when needed.

This makes Natrium valuable to utilities that are looking to increase reliability as more weather dependent renewable energy is brought onto the grid. Natrium can provide carbon-free electricity twenty-four hours a day, seven days a week, but can also ramp up and down to fill the gap when renewables, like wind and solar, are not available. Natrium will provide our customers with an emissions free, firm, and flexible generation option – a critical tool for utilities and countries looking to decarbonize their electricity systems.

Natrium and Advanced Reactor Fuel

TerraPower is confident that our Natrium technology will fill a critical need for utilities in the United States and abroad. As our project in Wyoming is moving forward, we've seen interest from utilities across the country and around the world who want to learn more about our technology. We're seeing states like West Virginia repeal bans on new nuclear plants, as they look for ways to create jobs and generate reliable, clean energy. And as countries in central and eastern Europe look for alternatives to Russian natural gas, Natrium's technology is well positioned to provide reliable, always-on, carbon free power to our allies.

But no nuclear reactor can operate without fuel, and most of the advanced reactor designs, including the two reactors being demonstrated by the Advanced Reactor Demonstration Program, require a special kind of fuel called High Assay Low Enriched Uranium or HALEU.

All nuclear reactors run on uranium enriched to certain levels. Low Enriched Uranium, or LEU, is the most common nuclear fuel, and it is

enriched to a level of 3%-5% of Uranium-235. HALEU is uranium enriched up to 20%. HALEU allows for advanced reactors to operate more efficiently, and allows the reactors to burn up more fuel, resulting in smaller volumes of spent fuel. But while there are dozens of advanced reactor designs being pursued in the United States that require HALEU, the United States does not currently have the capacity to produce HALEU.

As a result, today, the only source of commercially available HALEU is a Russian state-owned enrichment company, TENEX. When TerraPower applied for the ARDP in 2020, our plan was to use HALEU from this source for our initial core load while Congress and the DOE established the Advanced Nuclear Fuel Availability Program to make commercial HALEU available in the United States. This plan was blessed by the Department of Energy, as the best path to get our projects launched on the timeframe mandated by Congress, while the Department worked separately to launch the program created by the Committee to develop HALEU enrichment capability in the United States. But with the Russian invasion of Ukraine, TerraPower has made clear that it will not use Russian HALEU to power its reactor. That leaves our project, and many other advanced reactors, without a source of fuel.

While we are not the only company in the energy sector with a supply chain disrupted by the Russian invasion of Ukraine, we are one of the few with no other options for such a critical item. Without HALEU we cannot power our reactor, and without confidence that fuel will be available for future reactors, we cannot sell additional plants. Every other advanced nuclear developer in the United States that relies on HALEU faces the same issue.

The Committee recognized this problem long before Vladimir Putin's tanks crossed into Ukraine. The Advanced Nuclear Fuel Availability Program was created by the Committee, and enacted into law in the

Energy Act of 2020, nearly two years ago. The Energy Act of 2020 requires the Secretary of Energy to establish a program to support the availability of HALEU for projects like ours. As the Committee knows, DOE is moving forward with this program. The Department requested information from stakeholders in December, but we have not yet seen the program launch. It is imperative that Congress and the Executive Branch work together to get the Advanced Nuclear Fuel Availability Program up and running. The invasion of Ukraine has made the problem identified by the Committee in 2020 even more urgent, and multi-billion-dollar projects supported with federal funds are vulnerable because of this gap in the supply chain.

This is a big program, with significant interest from Congress and other governmental stakeholders, but it should be able to be launched quickly. The Advanced Reactor Demonstration Program was signed into law on December 20, 2019. The Department released the Funding Opportunity Announcement for the program on May 14, 2020 and made the awards on October 13, 2020 – less than ten months after the program was signed into law. Today is the eighteen-month anniversary of the Energy Act of 2020, which contains the Advanced Nuclear Fuel Availability Act, becoming law. The United States is supporting the rapid deployment of two advanced reactor designs, and the invasion of Ukraine has made this need even more urgent.

But even if a fuel availability program were launched today, it will be years before HALEU is produced in the United States at commercial scale. Once the awards are made, contracts will need to be negotiated, financing secured, and only then will construction begin on the centrifuges and facilities needed to produce HALEU. The ARDP award winners will require the first deliveries of HALEU for our initial cores long before these new enrichment facilities are operating.

TerraPower's schedule requires the first delivery of HALEU to its fuel fabrication facility in late 2025, which is why our original plan was to use HALEU from Russia for our first core load. With that option understandably off the table, the only viable path to remain on schedule is to use HALEU downblended from the Department of Energy's inventory of excess Highly Enriched Uranium, or HEU. HEU is used by the Department of Energy's National Nuclear Security Administration for research reactors, naval propulsion, and for weapons. A kilogram of HEU can be downblended into 3-4 kgs of HALEU.

Secretary Granholm and Assistant Secretary Huff have been working with their NNSA colleagues to determine how much of the excess inventory at the Department of Energy can be made available to keep the two ARDP projects on track. We've spoken with NNSA officials who are, we believe, earnestly looking for material that can be downblended into HALEU. While they report that they have identified some material that can be used, the volumes they've identified to date are below what is needed to fuel the two ARDP projects' initial cores.

The amount of excess HEU available for downblending is classified, but in March 2016 the Obama Administration declassified the HEU inventory as of September 2013. In that report, the Department of Energy reported a total HEU inventory of 585.6 metric tons, with 41.6 metric tons available for downblending. We believe 5-6 metric tons of HEU could be downblended into enough HALEU for the two ARDP demonstration project initial cores.

While we do not know the current amount of HEU available for downblending, we understand that some of that material remains in weapons that need to be disassembled, and that there are further constraints on the NNSA facilities used to perform downblending. But without this material, there is no path for the Advanced Reactor

Demonstration Program to meet the timeline prescribed by Congress. I am encouraged that the legislative efforts contemplated by the Committee today provide the resources and direction necessary to allow the ARDP initial cores to be fueled with HALEU downblended from HEU in a way that does not threaten America's national security.

To be clear, downblending of HEU is a temporary solution to the HALEU problem. We will need both the fuel provided from downblending for our initial core, as well as a fully functional, fully funded, Advanced Fuel Availability Program for subsequent cores and to meet the growing demand for advanced nuclear technologies in the United States and around the world.

Comments on the Bills Being Considered Today

As such, we are encouraged that the Committee is discussing these bills, which seek to strengthen the nuclear fuel supply chain, and move towards a solution on the back end of the fuel cycle.

First, S. 4066, the Fueling Our Nuclear Future Act of 2022, recognizes the critical and urgent need for domestic HALEU enrichment capabilities and properly directs the Department to accelerate efforts to establish domestic, commercial enrichment capabilities. It also notes that even if that process started today, those capabilities would not be in place to provide for the initial core loads of the ARDP reactors on the schedule put forth by Congress. As such, it looks to downblending of HEU from the DOE stockpile to meet the initial need. The Fueling Our Nuclear Fuel Act recognizes that we must do both, and we must move quickly, given the advanced reactor fuel implications of the Russian invasion of Ukraine.

Secondly, on S. 3856, a bill to prohibit the importation of uranium from the Russian Federation, TerraPower has made clear after the invasion

of Ukraine that we would not be using Russian HALEU in our reactor. We believe that America and the west need reliable, stable supply chains for advanced nuclear, and Russia is not a reliable, stable partner. As I noted in my testimony, however, Russia is the only commercial enricher of HALEU, the fuel needed for America's advanced nuclear reactors. As such, it's appropriate that the Committee is considering both S. 3856 and S. 4066 together. Ending the importation of Russian HALEU will require the establishment of domestic capabilities to produce HALEU, as well as ensuring that our operating fleet has the fuel it needs to continue to provide carbon-free, reliable electricity at plants across the country.

Ensuring that advanced reactor developers and operators have access to a reliable supply of advanced nuclear fuels is an important national priority, and we appreciate the Committee's work on this issue.

Conclusion

Finally, let me again express my sincere appreciation for all that this Committee has done over the past number of years to support advanced nuclear power. The Advanced Reactor Demonstration Program is a direct result of the Committee's work, as is the Advanced Nuclear Fuel Availability program. Those bills built on the Nuclear Energy Innovation Capabilities Act of 2017, and the bills being considered today will continue to build on that legacy.

Both Chairman Manchin and Ranking Member Barrasso, and many other members of the Committee, have been leaders on advanced nuclear and we are confident you will begin to see the commercial reactors made possible by your work soon.

Thank you again for the invitation to testify today, and I look forward to taking your questions.

Senator HEINRICH. Thank you.
Mr. Leuck.

**OPENING STATEMENT OF MATT LEUCK,
TECHNICAL SERVICES MANAGER, NESTE, U.S.**

Mr. LEUCK. Thank you, Senator Heinrich, Senator Barrasso, and members of the Committee. My name is Matt Leuck. I am the Technical Services Manager at Neste, U.S., based in Houston, Texas. I definitely appreciate the opportunity to come discuss S. 4038, the Renewable Diesel and Sustainable Aviation Fuel Parity Act, and more importantly, why this legislation is important to expanding the availability of low-carbon fuels both for long distance and heavy-duty vehicles.

Neste is a leading producer of low-carbon fuels. We are currently the world's largest producer of renewable diesel and sustainable aviation fuel, with a current production capacity of over one billion gallons annually, and with ongoing expansions of refineries and a soon-to-be finalized joint venture in California that will bring us to over 1.8 billion gallons a year by the end of 2023. Currently, one-third of Neste's annual volume is sold into California, which is helping actual groups here in the U.S. make meaningful climate impact. Last year alone, 3.3 million tons of GHG were abated in California alone.

What is renewable diesel? There is a much longer and much more technical explanation in my written testimony, but I will touch on a few things here. This is important because the chemical composition of these fuels is what determines their level of access to existing infrastructure, whether that be storage tanks, pipelines, or fueling stations. Renewable diesel is a fuel made of pure hydrocarbons. Just like a fossil diesel, it is pure hydrocarbons. So when you have a blend of these fuels, the only way to determine what that ratio is, is actually using carbon-14 dating, which is what archeologists may use for artifacts. Biodiesel, on the other hand, is not a hydrocarbon. It is an ester molecule that happens to run a diesel engine, but again, not a hydrocarbon. So while renewable diesel can provide quicker cold starts, lower emissions, and also reduce maintenance costs for owners and consumers, biodiesel can suffer issues like cold flow properties, storage concerns, and other things.

The big question is, why not electricity? So in some applications, renewable diesel is as environmentally friendly, if not more so, than electrifying those same pieces of equipment. Stillwater Associates recently released a report showing that fueling with 100 percent renewable diesel resulted in three times larger cumulative GHG reductions by 2032 than equivalent EV conversion scenarios, and also doing it at one-third of the cost of converting those things to EV.

So why does labeling actually matter? The relatively small policy change would allow renewable diesel significantly more access to existing infrastructure, and it can help expand the availability of low-carbon fuels across the nation. Diesel does reach the market via multiple sources, including pipelines that are accessed by many refiners at the same time. So from a technical perspective, renewable diesel, because it is chemically diesel fuel, can utilize that

same network. But unfortunately, the labeling required by the Independence and Energy Security Act of 2007, the precise percent of renewable diesel must be tracked all the way to point of sale of customer. That is only required for biomass-based diesel though, not coal-to-liquid diesel fuel or gas-to-liquid diesel fuel or other technologies. So by treating this as something non-fungible, the labeling is actually effectively capping the market to five percent blends of renewable diesel. To move to a higher concentration, refiners, pipelines, and terminals must all agree on a fixed percentage, and that does require segregated storage and separate transportation, rail cars, trucks, and other modes of transportation that actually do have their own carbon footprints. So by not allowing it in the pipeline, you are putting more carbon into the atmosphere.

Also, consumers are not required to take any action based on the percent of renewable diesel blended into their fuel. So by applying these labeling requirements that are unnecessary and arbitrary, we are actually not providing any actionable information that gets into the consumer protection. The labeling requirements serve as a barrier to entry that can also discourage construction of new renewable diesel production capacity, again, because that segregated storage creates logistics concerns near the refineries, but also getting it to market and creating that higher carbon footprint. So the bottom line is that there is neither a technical reason, nor a consumer benefit to maintaining the current labeling requirements for any renewable diesel that meets the ASTM D975 standard. While heavy-duty and long-distance vehicles are more difficult to decarbonize, they are harder to electrify. Significant opportunities to decarbonize those areas do exist right now at no additional cost. So with appropriate policy support, the labeling reform included in S. 4038, these sectors can meet science-based decarbonization goals today without waiting for time in the future.

So waiting for your questions later. Thank you.

[The prepared statement of Mr. Leuck follows:]



**Statement of Matt Leuck
Technical Services Manager, Neste US
Senate Energy and Natural Resources Committee Hearing to
Consider Pending Legislation**

July 28, 2022

Senator Heinrich, Senator Barrasso, and Members of the Committee:

My name is Matt Leuck. I am the Technical Services Manager at Neste US based in Houston, Texas. I appreciate the invitation to discuss S. 4038, the *Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022* and specifically why this legislation is important to expanding availability of low-carbon fuels for long-distance and heavy-duty vehicles.

Who is Neste?

Neste is the leading producer of such fuels. We are the world's largest producer of renewable diesel and sustainable aviation fuel, with an annual production of more than 1 billion gallons of renewable products. Our ongoing Singapore expansion project, and the pending establishment of a joint venture in California, will increase our total production capacity to more than 1.8 billion gallons by the end of 2023 and make us the only provider of renewable products with a production footprint on three continents.

Roughly one-third of our globally-produced renewable diesel volumes are sold and consumed in North America, with the majority of those gallons driven to California thanks to the state's long-standing Low Carbon Fuel Standard. To put that quantity into perspective, in 2020, 16% of California's diesel demand was met by renewable diesel and 40% of that renewable diesel was produced by Neste. Our product accounts for just over 6% of the state's total diesel pool.

Those gallons make a meaningful climate impact – last year, our renewable products enabled American cities and businesses to keep 3.3 million tons of new greenhouse gas emissions out of the atmosphere. In just one example, the Twin Rivers Unified School District near Sacramento achieved a major milestone in its climate action plan by switching 75 diesel-powered school buses to run on renewable diesel fuel provided by Neste. As a result, the district's fleet is now fully fossil-free – one of the cleanest in the country. Because renewable diesel is a drop-in fuel, Twin Rivers was essentially able to achieve this remarkable milestone overnight.

By simply changing fuels, Twin Rivers – the 28th largest school district in California with 26,000 students – will realize a 75% reduction in lifecycle greenhouse gas emissions from its diesel fleet of school buses. Importantly, switching to renewable diesel did not increase costs to the school district – or its taxpayers. Since the switch, Twin Rivers is keeping more than 520 metric tons of CO₂ out of the atmosphere each year – the equivalent of planting two dozen trees every day.

What is Renewable Diesel?

Renewable diesel is a hydrocarbon fuel that is fully fungible with fossil-based diesel fuels and can be blended with no issues at any rate up to 100%. It is important to recognize how renewable diesel – the product we produce and the subject of the labeling reform in S. 4038 – relates to fossil diesel and differs from conventional biodiesel.

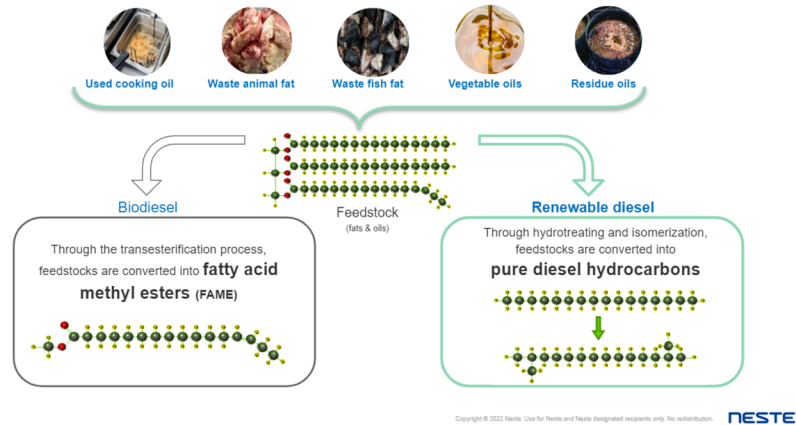
Diesel fuel is a homogeneous mixture with elemental composition primarily of carbon and hydrogen, commonly referred to as hydrocarbons. While both renewable diesel and biodiesel can be made from the same feedstocks, the final products are not identical. The feedstocks used for bio-based fuels – used cooking oil, waste fish oil, tallow, technical corn oil, etc – all contain fatty acids (triglycerides) which are essentially three hydrocarbon molecules bonded together by other carbon, hydrogen and oxygen atoms. The goal of any fuel production is to break apart these fatty acids and isolate the hydrocarbon molecules.

When producing renewable diesel, the feedstocks previously mentioned are put into a two-step process. First is hydrotreating, where the feedstocks are reacted with hydrogen and catalyst material to break apart the triglycerides. One key advantage is the oxygen atoms from the fatty acid are removed (they bond with excess hydrogen to produce water that goes to a treatment facility) and this means the fuel molecules produced are pure hydrocarbons. Additionally, another “byproduct” of this production method is renewable propane. Hydrotreating also removes any impurities (sulfur, nitrogen, metals, etc) that might be in the feedstock stream. The second thing that happens is any irregularities (chemical double bonds) in the feedstock are corrected and the final product is a purely paraffinic, “fully saturated” hydrocarbon. From there these hydrocarbons are sent to an isomerization unit where the shape of the molecule is changed to allow for better, and precisely controlled, cold weather performance.

To produce biodiesel, a different process called transesterification is used. This is a chemical reaction using feedstock, an alcohol (e.g. ethanol) and an acid catalyst. This process will break the bonds of the triglyceride, but it is not able to remove the oxygen from the resulting fuel molecule. This is why biodiesel is not a hydrocarbon; it is a fatty acid methyl ester (FAME). While biodiesel fuel is able to power a diesel engine, it is not typically approved for use as a neat, or 100%, fuel. Nearly every engine manufacturer has a FAME biodiesel blend limit of 20% (B20) and any higher concentration can void warranties, cause engine damage via deposit formation, shorten storage life, and provide less than ideal performance characteristics during cold weather operation. For these reasons, the ASTM D975 diesel fuel specification only allows for 5% biodiesel to be blended into the final product that goes to market. There is another ASTM specification, D7467, that covers blends from 6% to 20% biodiesel (B6-B20), and D6751 which governs B100, but there is no ASTM specification for biodiesel fuel blends from B21-B99.

All of this means renewable diesel is a pure hydrocarbon fuel that meets the same ASTM D975 specification fossil diesel is required to meet. It is nearly contaminant-free by nature of the refining process (if you didn't put it in to start, you don't have to take it out); its paraffinic molecules are extremely stable and provide great storage life; and its higher cetane and aromatic-free makeup can lead to cleaner combustion and lower emissions.

Bio-based diesel production



Why not electrify instead?

Heavy-duty and long-distance vehicles are more difficult to decarbonize through electrification than light-duty transportation. While air- and watercraft are particularly challenging due to their distance traveled and weight considerations, long-distance electric truck transportation requires costly charging infrastructure that is not yet available. Likewise, critical heavy equipment needed when electric power is unavailable and large, diesel-powered fleets currently in operation will continue to require liquid fuels for decades to come.

From a climate perspective, that may not be a bad thing if the liquid fuel is renewable diesel. In some heavy-duty applications renewable diesel is as environmentally-friendly, or even more so, than electrification. A recent study by Stillwater Associates LLC showed that fueling diesel vehicles with 100% renewable diesel resulted in three times larger cumulative GHG reductions by 2032 than EV scenarios.¹ The study examined medium and heavy-duty trucks operating in 10 Northeastern states (Connecticut, Delaware, Massachusetts, Maryland, Maine, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) that have adopted California's low emission (LEV) and zero emission vehicle (ZEV) regulations.

Attaining those three times larger GHG reductions through new diesel engines and renewable diesel costs about a third of what it would to electrify the same fleets. The Stillwater study found:

"On a cumulative fleet conversion cost basis, turning over a medium and heavy-duty fleet of 10,000 vehicles in the region over to EV carries a price tag more than three

¹ Stillwater Associates LLC, *Environmental Benefits of Medium- and HeavyDuty Zero Emission Vehicles Compared with Clean Bio- & Renewable-Fueled Vehicles 2022-2032* (July 19, 2022) <https://dieselforum.egnyc.com/dl/MWHPCRW4e6>

times higher than the equivalent cost for new technology diesel vehicles. The incremental EV cost for Class 7/8 vehicles is \$250,000 for the vehicle and \$45,000 for charging infrastructure.”²

Not only do advanced technology diesel engines paired with renewable diesel fuel offer a more immediate greenhouse gas emissions reduction compared to EVs, they also reduce other criteria air pollutants. The same study found 98% particulate matter (PM) reductions for new diesel engines compared to EV’s 95% PM reductions assuming power from U.S. average grid mix.³

In other words, some solutions are better suited to some problems than others – there is a need for all of them – and robust public policy can ensure options for customers to make cleaner changes sooner. As every fleet owner and equipment operator makes those choices, Neste and other renewable diesel producers will continue to offer a “today” solution to help meet science-based decarbonization goals.

Why does labeling matter?

While Neste welcomes the transparency S. 4038 would bring to the growing renewable diesel and sustainable aviation fuel markets through Energy Information Administration (EIA) reporting, the increased access to existing liquid fuel infrastructure the bill would bring through updating fuel dispenser labeling requirements is especially beneficial to the future of low-carbon liquid fuels.

As required by the Energy Independence and Security Act of 2007 (EISA07), the Federal Trade Commission (FTC) promulgated rules for the labeling of “biomass-based diesel.” Those rules define “biomass-based diesel” as any “diesel fuel substitute produced from non-petroleum renewable resources that meets the registration requirements for fuels and fuel additives established by the [US EPA]... (emphasis added).”⁴ At the time of promulgation of the first biodiesel amendments to the rule in 2008, and still today, fatty-acid methyl ester (FAME) biodiesel existed as the primary substitute for diesel fuel and is almost exclusively blended with diesel for on road use and for sale at retail pumps.

In layman’s terms, switching to renewable diesel may be thought of as substituting a cleaner fuel for a dirtier one. But unlike FAME biodiesel, as defined by Section 205 of EISA07, renewable diesel that meets the same ASTM D975 standard as fossil diesel is not a *substitute* for diesel; it is chemically diesel fuel made without fossil feedstock.

Diesel fuels can, and very often do, enter a terminal from multiple sources including multiple refineries sharing a pipeline network. Renewable diesel as a hydrocarbon oil and approved for transport on the pipeline can utilize the same network. Because multiple sources are co-mingled in the pipeline, a separate labeling requirement for some of the products creates logistical obstacles and unnecessarily limits the inclusion of renewable diesel into the distribution system.

² Ibid

³ Ibid

⁴ 42 U.S.C. 17021(c)(4) incorporating the definition in 42 U.S.C. 13220(f)

By treating renewable diesel as a chemical “substitute” rather than fully fungible diesel fuel, the current labeling regime severely limits renewable diesel’s access to existing pipelines and storage facilities – effectively capping the maximum concentration of renewable diesel entering those systems at 5%. In order to move higher concentration of renewable diesel, refiners and terminal participants must agree to use a fixed concentration of renewable diesel or blend it further downstream. Blending at the terminal level requires segregated tank storage and shipping via trucks or railcars, all of which emits more carbon and costs more than co-mingled pipeline shipments.

Since consumers are not required by original equipment manufacturers (OEMs) and vehicle manufacturers to take any actions based on renewable diesel levels, applying the labeling requirements to renewable diesel is unnecessary, arbitrary, and provides no actionable protection information to the consumer. By correctly identifying renewable diesel without extraneous labeling requirements, renewable diesel may also be utilized in refinery blending (upstream from the terminals) to increase fuel supply flexibility while allowing refiners and subsequently consumers to capture lower costs and better quality fuels.

Alternatively, the inefficiencies caused by leaving the current labeling requirements in place actually harms consumers. The labeling requirements serve as a barrier to entry that discourages the construction of new renewable diesel production capacity, reducing future price competition, while the segregated distribution required increases global carbon emissions because truck and train distribution emits more carbon per product mile than fungible pipeline distribution.

Labeling requirements for FAME biodiesel, as S. 4038 correctly would leave in place, do provide important information to consumers. As described at length above, because of the differences in their chemical composition, biodiesel is subject to blending limits when used in engines while renewable diesel is not. **There is, however, neither a technical reason nor a consumer benefit to maintaining the current labeling requirements for any renewable diesel fuel that meets the ASTM D975 standard.**

Food vs. Fuel

Neste’s industry-leading sustainability requirements mean we always source our feedstocks in a way that protects air, forests, water, and human rights. Importantly, Neste does not source raw materials that compromise food security or contribute to land use change. This is our promise, and it’s non negotiable.

Our promise exceeds the requirements of public policy with respect to the “food versus fuel” discussion. California’s LCFS program, for example, limits the incentive to use certain crops for biofuels by applying indirect land use change penalties on a fuel’s carbon intensity score. This ensures the use of vegetable oils for fuel is not driving land conversion. That’s one reason that, today, soybean meal – not biofuels – is the primary driver of soybean production.

While soybean oil is a leading biofuel feedstock in the United States, Neste has also focused on waste and residue raw materials for over a decade. In 2021, the share of waste and

residues increased to 92% of our total renewable raw material inputs globally. In the mid- to longer term, Neste expects to introduce novel vegetable oils derived from advanced, climate smart agricultural practices to its raw material portfolio. These advanced agricultural concepts include: “winter cropping” (i.e. using the full potential of agricultural land to cultivate additional crops without replacing the main crop cultivated on the same land during other seasons), “silvopasture” (e.g. cultivating crops on pasture land alongside cattle), and cultivating crops on severely degraded or abandoned land.

The advanced biofuels industry as a whole continues to move toward even more sustainable and lower carbon intensity feedstocks. Neste and other producers are exploring ways to increase the availability of emerging, even lower-quality waste and residue raw materials, including algae, forestry waste, municipal solid waste and converting power to liquids.

Conclusion

While heavy-duty and long-distance vehicles are more difficult to decarbonize than light-duty transportation in that they cannot easily electrify, there are significant opportunities to decarbonize these sectors fast without the need for additional infrastructure or new equipment. A low carbon fuels-centered approach for these sectors offers significant advantages, and the needed technologies and feedstocks are available. With appropriate policy support – like the labeling reform included in S. 4038 – these sectors can meet science-based decarbonization goals.

Senator HEINRICH. Thank you, all. I will recognize myself for five minutes and then we will go with the Ranking Member and just go down the dais in the order that folks showed up.

So Ms. Speakes-Backman, I wanted to ask you a little bit about the microelectronics research centers, and particularly, how would they be implemented at labs that already have a substantial existing microelectronics R&D presence?

Ms. SPEAKES-BACKMAN. Thank you for the question and thank you for your leadership.

We are excited about the potential for the bipartisan chips bill that can help foster energy innovation. DOE has and continues to play a really vital role in reducing the energy that is required to produce and utilize microelectronics and to create more sustainable technology systems to help our energy system. The Office of Science at the Department of Energy has a unique position to play in this role, and it is critical for advancing microelectronics over the coming decades. We are very excited about the coordination that has expanded between the Office of Energy Efficiency and Renewable Energy and the Office of Science, and also with the labs. And so, a closely coordinated effort will be undertaken to make sure that this gets—

Senator HEINRICH. Yes, I guess one of the things I am trying to understand is, if you take a lab like Sandia and they already have something like the Mesa Complex that is very much in this lane, are we going to rearrange the pieces on the board, or are we going to coordinate that so that we are not moving things that we have already invested heavily in?

Ms. SPEAKES-BACKMAN. Thank you for the clarification on the question. We have no intent of moving the deck chairs around. We really have the intent to coordinate what is already existing, taking stock of the progress that has already been made to advance that and accelerate it.

Senator HEINRICH. Moving to weatherization, under the current legislation, would weatherization extend the things like electrical panels and breaker boxes that are oftentimes sort of the precursors to be able to do meaningful weatherization?

Ms. SPEAKES-BACKMAN. So in this current legislation, if the wiring, for example, is defective, then this would authorize the installation of weatherization measures by first using the readiness funds and then being able to weatherize.

Senator HEINRICH. So if something is defective, it would apply. If it just simply needs an upgrade for capacity, it would not apply.

Ms. SPEAKES-BACKMAN. It would not. I think there is some funding, though, in the Enhancement and Innovation program, as a part of this. There is about \$48 million available to organizers across the country to help support preparing homes for electrification and decarbonization.

Senator HEINRICH. Great.

Dr. Huff, do U.S. nuclear power plants have sufficient uranium fuel reserves to operate in the near-term and longer term if we cut off imports from Russia, and how are we going to manage that change?

Dr. HUFF. Thank you, Senator.

Our analysis in DOE has indicated that yes, there is a limited time in which the existing nuclear power plants can be sustained on their existing inventory, but that time is quite limited. They will need some years to wean themselves off of Russian imports. So it is an important feature of any proposed import policy restrictions.

Senator HEINRICH. What do we need to do to send the appropriate investment signals that this is going to be a long-term play, that we are not going—you know, it costs enormous amounts of money, obviously, to change the flow and create additional domestic capacity. So we have to send a signal that we are in this for the long-term. So can you talk a little bit about that?

Dr. HUFF. Thank you, Senator.

The Department of Energy, in response to Russia's unprovoked invasion of Ukraine, has stood up a uranium tiger team which developed a uranium strategy that suggests a procurement of fuel, LEU, low enriched uranium, including high-assay low-enriched uranium, which would support, from new capacity of conversion and enrichment services in the United States, the standing up of additional capacity for that fuel supply chain. That signal would have to be a sustained contract with awardees responding to a request for proposals and would have to be paired with stable import policies for the long-term.

Senator HEINRICH. Senator Barrasso.

Senator BARRASSO. Thanks so much, Mr. Chairman.

Mr. Navin, why did TerraPower make the decision to not use Russian uranium?

Mr. NAVIN. Well, I think for many of the same reasons that probably drove you to draft S. 3856, you know. We only planned to use Russian HALEU for our initial core load while the Department of Energy stood up the Advanced Nuclear Fuels Availability Act, which this Committee proposed and passed. You know, we were always a little hesitant about that, but we thought, you know, Russia had provided and does provide LEU to reactors and we thought we could maybe count on them to get the first core load, but obviously, when Vladimir Putin's tanks rolled into Ukraine, that calculus changed dramatically. And so, we are happy that you are addressing that part of the supply chain.

Senator BARRASSO. So America's nuclear industry, I think, is ready to make the transition away from Russian uranium, you know, Russia is the fourth largest supplier of uranium, but I think our nuclear industry in the United States needs some certainty, market certainty, specifically. So will banning Russian uranium provide the market certainty that industry needs to invest in domestic uranium supply chain?

Mr. NAVIN. Certainly, I mean, we have seen Russia engage in, you know, non-competitive acts to sort of price American companies out of business. We have more than enough, as you know, we have more than enough uranium in the United States to meet this need. Where the gap is, is on the enrichment side. And Senator Heinrich, you know, you have the Urenco facility in Eunice, but it is not licensed currently to produce HALEU. So for our needs, we need new enrichment capability to produce high-assay low-enriched uranium. And that investment will come as a combination of the Fuel Availability Act that you passed, a Senate demand signal, but also

certainty that we are not going to let outsiders come in and undercut those prices after those investments are made.

Senator BARRASSO. Mr. Leuck, I wanted to spend a little bit of time talking about the renewable diesel. You know, it is among the most promising ways, I think, to reduce carbon emissions from heavy-duty trucks and other engines that use diesel. Can you explain why that is?

Mr. LEUCK. Sure. So renewable diesel is made from waste and residues. It is existing carbon that was already in the atmosphere. So we are taking biogenic carbon rather than fossil carbon that has been sequestered for hundreds of millions of years and just reusing it. So we are operating the same equipment, getting the same power, doing the same work, but you are not actually adding carbon, you know, to the atmospheric load. Also, because it is a much cleaner fuel in the properties—the physical properties of it—they do allow for reduced maintenance costs for fleet owners and other things. So when you combine operational, environmental, it kind of does come out to be one of the best.

Senator BARRASSO. Now, anything different in terms of the aviation fuel and what we are trying to do there too?

Mr. LEUCK. I am actually not an expert on aviation, so I am not going to get too into that, sorry.

Senator BARRASSO. All right. Let me then move to labeling requirements, if I could, to you, Mr. Leuck. So nearly all renewable diesel production in the United States or anything imported comes through California, which is why Senator Feinstein and I worked on this legislation. So last year, the California Air Resources Board and the California Energy Commission specifically wrote to us and wrote to me. They explained that renewable diesel is fungible, fully interchangeable with petroleum-based diesel, in terms of its ability to be used. They also explain that there are no performance concerns with renewable diesel, that part of your testimony. The two regulators said that the Federal Government's "current labeling requirements serve as an artificial barrier to using higher levels of renewable diesel." And for that reason, they explained in their letter to me that we are losing an opportunity, an opportunity to deliver needed public health and climate benefits associated with using higher levels of renewable diesel.

So do you agree with the State of California's assessment of our Federal Government's current labeling requirement?

Mr. LEUCK. I do. I think the letter that Ms. Randolph and Mr. Hochschild wrote is exactly spot-on.

Senator BARRASSO. So then, Mr. Chairman, I ask unanimous consent to enter that letter into the record.

Senator HEINRICH. Without objection.
[The letter referred to follows:]



Senator Maria Cantwell, Chair
 Senator Roger Wicker, Ranking Member
 Senate Committee on Commerce, Science and Transportation

Senator Joe Manchin, Chair
 Senator John Barrasso, Ranking Member
 Senate Committee on Energy and Natural Resources

Senator Tom Carper, Chair
 Senator Shelley Moore Capito, Ranking Member
 Senate Committee on Environment and Public Works

August 26, 2021

Dear Senators:

The California Air Resources Board (CARB) and the California Energy Commission (CEC) request your consideration of an issue that is becoming an impediment to California's goals of protecting public health, especially in our most heavily burdened communities, and reducing dependence on petroleum fuels. CARB's Low Carbon Fuel Standard¹ incentivizes the production and use of drop-in fuels derived from renewable and sustainable feedstocks with the goal of reducing our greenhouse gas emissions in the transportation sector. Renewable diesel is important from the perspective of achieving our federal and state air quality mandates, contributing to state and national efforts to reduce greenhouse gases, and supporting traditional petroleum companies in transitioning to cleaner fuels. Under the flexibility of the Low Carbon Fuel Standard, producers of renewable diesel can be located within California or out of state.

Federal regulations require labeling of fuel dispensers to inform end-users on the types of biofuels blended with gasoline and diesel fuel.² Nearly all of these regulations require labels to specify the range of biofuel that could be contained in the gasoline or diesel fuel.³

¹ [Low Carbon Fuel Standard | California Air Resources Board](#)

² Language in the 2007 Energy Independence and Security Act (EISA) directed FTC to promulgate new labeling requirements for renewable diesel, among other things. These labeling requirements were modified in 2008 to include renewable diesel as part of FTC's Automotive Fuel Ratings, Certification, and Posting amendments.

³ Most gasoline sold in the United States contains ethanol at a concentration of 10 percent by volume. However, the labels on gasoline dispensers will state "May Contain Up To 10% Ethanol", rather than requiring a label specifying the exact concentration of ethanol. Similarly, locations that sell diesel fuel containing varying concentrations of biodiesel that are greater than 5 percent but less than 20 percent are also not required to use a label specifying the exact concentration of biodiesel. Rather, language describing a possible range of biodiesel is used instead that states "Contains Biomass-based Diesel or Biodiesel in Quantities Between 5 Percent and 20 Percent".

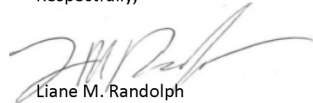
Currently, Federal Trade Commission (FTC) labeling regulations require fuel dispensers with diesel fuel blended with biomass-based diesel fuel (renewable diesel) in concentrations greater than 20 percent by volume to be labeled with the **exact** concentration of renewable diesel at the time of the fueling event.⁴ It is infeasible for many operators of fueling stations (gas stations, truck stops, card-locks, etc.) to determine the exact concentration of renewable diesel that will be dispensed and to create a new pump dispenser label for each new fuel delivery. Since federal pre-emption prevents California or any other state from passing labeling requirements that are counter to FTC regulations, we are reaching out to initiate a dialogue on potential options for how to address this issue. Further, given the fungible nature of renewable diesel with petroleum diesel and the fact that it has no bearing on performance the current requirements serve as an artificial barrier to using higher levels of renewable diesel. As such, we are losing an opportunity to deliver needed public health and climate benefits associated with using higher levels of renewable diesel.

In California, use of renewable diesel has grown by 528% between 2013 and 2019. In 2019, it displaced 618 million gallons of conventional diesel. Renewable diesel reduces particulate matter, a known cancer-causing pollutant, by about 30 percent compared to conventional diesel. A significant portion of California's population, often communities of color, lives near or adjacent to freeways and has borne disproportionate air quality impacts from the combustion of conventional diesel fuel. The displacement and eventual phase out of conventional diesel combustion is critical to address this environmental justice issue. In addition, Marathon and Phillips 66 are pursuing permits to modify their existing refineries in California to produce a combined total of 1.5 billion gallons of renewable diesel per year once fully operational by 2024. Both companies plan to begin production of renewable diesel during the first phase of these projects with the goal to supply nearly 400 million gallons by 2022. The challenges posed by the current labeling constraint will hinder the ability for these companies to supply this fuel and other companies from transitioning to production and delivery of sustainable fuels as we transition to a green economy.

We look forward to engaging on this important public health, environmental protection, and economic transition issue. We are available to assist in anyway we can to ensure the current label efforts do not preclude the increased use of renewable diesel and, by extension, forego critical near-term community protection and climate benefits.

Please contact David Garcia at david.garcia@arb.ca.gov or (916) 207-8355 with any questions regarding this information.

Respectfully,



Liane M. Randolph
Chair
California Air Resources Board



David Hochschild
Chair
California Energy Commission

⁴ Code of Federal Regulations, Title 16, Chapter I, Subchapter C, Part 306, Automotive Fuel Ratings, Certifications, and Posting

Senator BARRASSO. And then, Mr. Navin, the Department's two advanced reactor demonstration projects, which will be sited in Wyoming and Washington State, they need about 20 tons of high-assay low-enriched uranium. Commercial enrichment is not going to be available in time for the initial fuel loads. The Department has sufficient supplies of excess uranium to meet these initial needs. Significant investment will be needed to make this uranium available. Why is access to the Department's stockpiles of this uranium so very important?

Mr. NAVIN. Well, as you know, Senator, the Advanced Reactor Demonstration Program requires us to bring the X-energy reactor and the TerraPower reactor online by 2028, within seven years, and that time frame is aggressive, but very much appropriate as we are trying to bring these technologies to the marketplace. Without having the ability to down-blend HEU, we will not have the fuel available to turn those reactors on in time.

So it is a stopgap measure. No one is proposing that we use down-blended HEU to run these reactors in perpetuity, but to get those initial core loads on to fill that gap while the fuel availability program gets stood up, it is the only way that we can meet the deadline and bring these products to market.

Senator BARRASSO. Yes, thank you.

Thank you, Mr. Chairman.

Senator HEINRICH. You bet.

Senator Marshall.

Senator MARSHALL. Thank you, Mr. Chairman.

My first question will be for Mr. Wech. I want to talk just a second about Senate bill 3719, the Southwestern Power Administration Fund Establishment Act, authored by Senator Moran, my Senior Senator. Senator Moran is always locked in on helping Kansans and helping drive down affordable clean energy cost down for Kansans. It is my understanding this legislation would give the Southwestern Power Pool more certainty, and when it would give you more certainty, it allows you to be more efficient and eventually, hopefully, will make the price of clean fuels more affordable in Kansas. Can you just speak to that for a second? How does that work, and how would it impact Kansans?

Mr. WECH. Senator Marshall, thank you for your question. I appreciate it and thank you for allowing me to be here today.

With respect to how it would help Kansans, under our current authorities we have use of receipts, or the power of sales receipts that come in, but many times there are constraints there due to budget scoring or other issues. Going forward, by establishing a revolving fund, that would allow us to establish both an operating and a forward-looking fund that, when emergencies occur—triple digit temperatures like we are seeing right now across the country, high power prices due to constraints on the bulk power system—we are prepared and have the funding certainty to be able to make replacement power purchases, respond to those emergencies, respond to that diversity that we may see in power prices. Having that funding certainty that we do not have today, because in today's world we have to go back and request emergency funding and emergency funding has to be paid back in a very, very short time

period, within one year. So that is immediate rate volatility to Kansans and many of our other ten million end-users.

So the intent of this fund is to pre-plan, have the funds available, and when we have these kinds of emergencies, respond without large rate spikes and volatility to customers.

Senator MARSHALL. That is great. It sounds like it would make you more efficient.

Mr. WECH. Yes, sir.

Senator MARSHALL. I am so excited about today's hearing. This is why I came to the Senate, to solve problems like this, to think about how innovation can impact American citizens. And I think that the bills we are considering today will do just that, and that it is going to be innovation that drives clean, affordable energies, not heavy-handed government taxes and regulations.

So Dr. Huff, we have work to do. And I just want to spend a few moments educating the Senators and their staff as well. I want to talk about recycling uranium for a minute. So just walk us through, right now, what happens to the uranium waste from our current nuclear energy plants? What are the opportunities for recycling? What are we spending right now just to protect that waste? And is it a national security issue? Just walk us down that for a second.

Dr. HUFF. Thank you, Senator.

We in the Office of Nuclear Energy agree that there are a variety of options for the future of our spent nuclear fuel. The current situation is that once reactor fuel is removed from the core, after it has spent some years in that core, this solid material, the rods are removed from the core and kept in a cooling pool where it cools down for a few more years. Once it is quite cool, it is removed and dried and placed in a dry cask which is held at the facility where it was generated until the Federal Government takes on that responsibility, takes title to the fuel and removes it from site.

The Nuclear Waste Policy Act dictated that we in DOE should be removing that fuel by 1998. As that has not happened, we now pay the utilities, through the Judgment Fund, some fees which now total quite a bit—\$9 billion—I believe.

Senator MARSHALL. Annually.

Dr. HUFF. Total since 2013.

Senator MARSHALL. Okay.

Dr. HUFF. Yes.

And so, until the Department of Energy begins to remove that fuel, we will continue paying from that Judgment Fund, but eventually, once our consent-based siting process identifies a site for interim storage, we should be able to remove it from that site, put it in an interim storage facility, stop paying from the Judgment Fund, and explore options for permanent disposal.

Your question on recycling—

Senator MARSHALL. Wait a second, what about—isn't there lots of security involved to keep that safe from people who could use that in bad ways?

Dr. HUFF. Yes, currently the largest part of the cost of that kind of thing is, you know, it is stored onsite at the reactors behind gates and guards with guns.

Senator MARSHALL. Right, and in the near future, we don't see any place where this is going?

Dr. HUFF. Well, our plan is to establish a location for an interim storage—

Senator MARSHALL. Which nobody wants.

[Laughter.]

Senator MARSHALL. Okay, let's talk about the opportunities. Here are the opportunities. What are the recycling opportunities, please?

Dr. HUFF. I will say it is possible to, as the French currently do, remove that fuel from the, you know, casks, split it chemically and reform it into new fuel which can be put back into reactors. Here in the United States, we do not currently reprocess spent nuclear fuel, largely because of the economic challenges of that endeavor. However, in the Office of Nuclear Energy, we pursue fuel cycle research to lower the cost of that kind of process in the hopes that someday it could be an option.

Senator MARSHALL. But it goes way beyond that. We could use Uranium-235 for the light water reactors. There is plutonium, strontium, a whole lot of other issues we could use that for as well, medically, lots of opportunities for that waste.

Dr. HUFF. Every nuclide in the table of the nuclides—3,000 nuclides are produced in a reactor available in that fuel.

Senator MARSHALL. What an opportunity. Thank you so much.

Oh, and by the way, I am going to invite you to come do a staff meeting, really, for the staff members of this Committee. I would love for you to sit down and just talk about nuclear recycling with them a little bit. It is just an incredible opportunity.

Thank you, Mr. Chairman.

Senator HEINRICH. Thank you for your interest, and I would point out that we are talking about a temporary facility to store some of that, but we have no long-term geologic repository. So what temporary means is very much up in the air.

Senator King.

Senator KING. Thank you, Mr. Chairman.

Mr. Leuck, in your written testimony you mentioned briefly forestry waste as a feedstock, and I wish you would expand on that. We are doing research on that at the University of Maine, and of course, as the most forested state in the nation and the most oil-dependent state in the nation for heating, this is of great interest to us. Talk about forestry waste and biomass as a heat source.

Mr. LEUCK. Sure. So for renewable diesel right now we are using waste and residues as a feedstock. That is the current technology, bio to liquid. The next generation of technologies will likely be lignocellulosic and municipal solid waste.

Senator KING. Lignocellulosic is a big word for wood waste.

Mr. LEUCK. It is. So yes, exactly. So forestry waste or crop waste. So treetops, bark, branches, things that do not go to the timber industry and do not really have a useful life once a tree is cut down. We are working on technology to take that and actually turn it into usable, renewable diesel fuels.

Senator KING. And the other side of that is, it is pretty good to get all this junk out of the forest because of the forest fire danger.

Mr. LEUCK. I am sure it would be, yes.

Senator KING. So this is, you think, a viable path for this material?

Mr. LEUCK. You know, our company invests a lot of money into research and development and innovation and technology, and this is very much on the forefront of our work, you know, globally we are based in Finland, which is like Maine, it is a very forested country, right? There is a lot of opportunity there for the ligno feedstock. So yes, I think there is very good opportunity.

Senator KING. Thank you.

Ms. Speakes-Backman, in terms of energy and renewable energy, to me, the golden opportunity is energy storage. If we can crack cost-efficient, effective energy storage, we can move to an entirely fossil-free energy grid, because wind and solar, we know, can supply the power, but the question is, what happens when the wind does not blow and it is not sunny. So I hope storage—and storage is part of the bill that we will be discussing next week. We have passed several bills, but I hope that is a high priority. I cannot think of something that could make a bigger difference in a shorter period of time than the development of grid-scale, economically viable storage.

Ms. SPEAKES-BACKMAN. Thank you for your thoughts on that subject. I could not agree with you more. The Department is spending—

Senator KING. Can we be sure that is in the record, that—

[Laughter.]

Senator KING. Go ahead.

Senator HEINRICH. Twice.

Ms. SPEAKES-BACKMAN. The Department is focused very much on not only the clean energy technologies that can produce the power, but how can we get our entire system more efficient in terms of grid, and for energy storage, including batteries, how can we get the carbon out of our transportation sector. So—

Senator KING. But that—if we can develop the storage capacity and the clean grid and electrify transportation and electrify with heat pumps, that is probably 75 percent of the carbon budget.

Ms. SPEAKES-BACKMAN. Absolutely. Currently, the transportation sector is the highest of the five major sectors contributing to greenhouse gases. But buildings are not far behind, as is the power grid.

Senator KING. But the cleanliness, if you will, of electric vehicles depends on how the electricity is made that goes into them.

Ms. SPEAKES-BACKMAN. 100 percent—

Senator KING. You are not gaining a lot if it is oil-produced power. If it is nuclear or renewable, then you are in a fossil-free future.

Ms. SPEAKES-BACKMAN. Yes, sir. And thank you for that observation. I think working across the entire Department of Energy, and actually, a whole-of-government approach, is really how we have taken a look at how we can impact the sectors and how the sectors interact. I think that is the name of the game, not just a technology specific, but really figuring out how they interact and how we can accelerate it.

Senator KING. Well, there will be a necessity for additional transmission. I think that is clear as part of—anybody that looks at this problem.

The other issue on storage, I hope we do not put all of our eggs into the battery basket. There are older technologies, 100-year-old pumped storage of water or weights and there is all kinds of research. So that kind of thing, because batteries have their own set of problems in terms of rare earths and importing minerals and mining. So I hope that the research is not confined to just batteries.

Ms. SPEAKES-BACKMAN. Yes, sir, and thank you for the question. I think there are various levels of commercial viability of different technologies of energy storage. So when you think about lithium-ion batteries, it is terrific for the two-and-a-half to four-hour storage that is necessary on the grid today, but when we think about a higher penetration of renewables onto the grid, we are going to need longer and longer duration. And actually, we have this already when you think about hydropower and pumped hydropower storage opportunities. So what we are working on in the Department of Energy, from our Water Power Technologies Office, is really ways to make sure that we can produce hydropower and to store energy through hydropower storage technologies more efficiently, more effectively, and be more integrated with the grid.

Senator KING. Well, one of the models is Norway and Denmark. Denmark, very heavily wind. Norway, very highly hydropower, and they swap power back and forth as needed and true-up at the end of the year. Hydro-Québec could be the battery for all of the North-east.

Thank you, Mr. Chairman.

Senator HEINRICH. Thank you, Senator.

Senator HIRONO.

Senator HIRONO. Thank you, Mr. Chairman.

I have a question for, is it Ms. Speakes-Backman? Am I pronouncing your name correctly?

Ms. SPEAKES-BACKMAN. Yes, Senator.

Senator HIRONO. Close enough?

[Laughter.]

Ms. SPEAKES-BACKMAN. It was perfect.

Senator HIRONO. Thank you so much. This has to do with the water heater efficiency standards. I am co-sponsor with Senators Stabenow and Blackburn of S. 4061, to update definitions of the water heating equipment and more clearly define residential and commercial water heaters because they are, I think, regulated differently. So I know there has been some debate on the House side about how the bill's direction for DOE to consider requiring electric storage water heaters to be capable of demand response could push other non-electric, non-DR water heaters out of the marketplace. That is not the intent. Is there anything in S. 4061 that would impact DOE's ability to regulate standards for appliances in a fuel and a technology-neutral way or otherwise restrict or be a disincentive to the availability of non-electric water heaters in the market?

Ms. SPEAKES-BACKMAN. Thank you very much for your question. We agree with you that there is terrific potential for impacting markets, especially for folks who are suffering from high energy bills with this—

Senator HIRONO. That would be people in Hawaii.

Ms. SPEAKES-BACKMAN. We are very excited about the potential. To answer your question more directly, there is nothing in this bill that changes the efficiency standards in a fuel and technology-neutral way. This bill does allow, however, DOE to consider demand response of electric water heaters specifically, so as to increase the efficiency of grid interactivity of buildings.

Senator HIRONO. Again, for you—one of the updated definitions in S. 4061 is for solar thermal assisted electric water heaters, and using the sun's free energy to heat and store water is important to Hawaii's transition to renewable energy and will help people to lower their energy bill. As of April 2019, Hawaii requires all new single-family homes built in the state to have a solar water heater. My understanding of the definition of solar water heaters contained in the bill is that it will finally provide certainty to manufacturers and consumers of solar water heaters and allow for the continued availability in Hawaii and other parts of the United States. Is that correct?

Ms. SPEAKES-BACKMAN. Yes, it is correct, Senator.

Senator HIRONO. Do you agree that the bill will help residential and commercial consumers have a water heater that is equipped appropriately to their needs and the intended use of the water heaters?

Ms. SPEAKES-BACKMAN. Yes, Senator. We think that the definitions in this bill really allow us at the Department of Energy to consider the unique benefits of solar thermal water heaters.

Senator HIRONO. I think that Hawaii has the greatest penetration of solar—use of solar—of any of the states, but we started off being totally the most oil-dependent state in the country, paying the highest bills, and we are now at the forefront and moving to clean energy, 100 percent, by 2045. So I think we lead the country in that effort. And of course, water heaters—that is a big part of energy consumption.

So much of the nation has been suffering from—again, for you—from intense heat waves and such severe weather consistent with climate change, it increases people's demand for electricity and threatens the reliability of the grid. The Natural Resources Defense Council, the American Council for an Energy-Efficient Economy, the Appliances Standards Awareness Project, and the Air-Conditioning, Heating and Refrigeration Institute have submitted for the record a letter of support for S. 4061.

[Letter of support for S. 4061 follows:]

July 28, 2022

The Honorable Joe Manchin
Chairman
Committee on Energy & Natural Resources
U.S. Senate
Washington, D.C. 20510

The Honorable John Barrasso
Ranking Member
Committee on Energy & Natural Resources
U.S. Senate
Washington, D.C. 20510

Dear Chairman Manchin and Ranking Member Barrasso:

We the undersigned organizations are writing to support S. 4061, legislation introduced by Senators Debbie Stabenow, Marsha Blackburn, and Mazie Hirono to amend the Energy Policy and Conservation Act (EPCA) to clarify and update the definitions of residential and commercial water heaters and authorize national demand response capability requirements for consumer water heaters.

The legislation in part responds to a final rule issued in November 2016 by the U.S. Department of Energy (DOE) that revised test procedures for commercial water heaters in such a way as to effectively require manufacturers to recategorize commercial water heaters to meet residential efficiency standards.

A temporary “non-enforcement” policy from DOE expired at the end of 2021. Therefore, an amendment to the statutory definitions of water heaters in EPCA is necessary to clarify and update the definitions of residential and commercial water heaters in EPCA and rectify this reduction in options for commercial consumers.

The bill also addresses the growing need for water heater demand flexibility. Increased severe weather events, such as the heat wave that affected much of the country last week, are driving higher peak electricity demand levels that can threaten grid reliability and increase electricity prices. Additionally, in many parts of the country, underutilized low-cost renewable power is available at certain times, such as nighttime wind resources. Grid-flexibility technology that enables storage water heaters to respond to grid conditions and variable electricity prices can help reduce peak demand and consumer costs by heating water when power is cheap, clean and plentiful.

Several states have now enacted or authorized manufacturing requirements to ensure that new water heaters are factory-ready to provide grid-flexibility services. By authorizing a national approach, the bill would provide a pathway that could improve business certainty for manufacturers and for utilities, facilitate broader access to use this technology, and strengthen grid flexibility and reliability.

We are grateful to Senators Stabenow, Blackburn, and Hirono for offering this much-needed legislation that will provide business certainty to water heater manufacturers, while providing appropriate product choice to customers.

Sincerely,

Air-Conditioning, Heating, and Refrigeration Institute
American Council for an Energy-Efficient Economy
Appliance Standards Awareness Project
Natural Resources Defense Council

Senator HIRONO. Mr. Chairman, you can see that I am really pushing for S. 4061. So there you go.

[Laughter.]

Senator HEINRICH. Duly noted.

Senator HIRONO. I am on a roll here.

And the letter states, “grid flexibility technology that enables storage water heaters to respond to grid conditions and variable electricity prices can help reduce peak demand and consumer cost by heating water when power is cheap, clean, and plentiful.”

Do you agree with their assessment that water heaters equipped to respond to the demands on the electric grid can help people save on their electric bill?

Ms. SPEAKES-BACKMAN. Absolutely.

Senator HIRONO. Thank you.

Okay, I think I have made my point.

[Laughter.]

Senator HIRONO. Thank you.

Senator HEINRICH. Thank you, Senator.

Ms. SPEAKES-BACKMAN. Thank you.

Senator HEINRICH. Senator Kelly, would you like to go next?

Senator KELLY. I would, thank you. Thank you, Mr. Chairman.

Ms. Speakes-Backman, and good morning and thank you, everybody, for being here today, all of you.

But I want to take a few minutes to talk about microelectronics and microchips. As you know, semiconductor chips are in everything from cars, fighter jets, satellites, advanced missile systems, most of our weapon systems, and the U.S. faces two serious challenges when it comes to microchips. First, we do not make nearly enough of them here in the United States, and the bipartisan plan to fund the CHIPS Act and enact the FABS Act, which we passed just yesterday, is going to help to reverse that trend and hopefully the House passes this. They have a critical vote coming up here, probably early this afternoon, to get this finally across the finish line. And we are hopeful that that is successful. But secondly, we also have to maintain U.S. leadership in microchip innovation.

So last week, it was publicly reported for the first time that a Chinese chip maker had successfully produced chips smaller than ten nanometers. And this represents a serious threat to American leadership in technology and innovation, and we invented semiconductor chips. But it also makes it more critical that we redouble our efforts to out-innovate the rest of the world. That is why I am glad that the Committee is today considering the bipartisan bill which I introduced earlier this year with Senator Blackburn called the Microchips Research and Energy Innovation Act, or the Micro Act for short. And our bill will establish the first-ever research program within the Department of Energy’s Office of Science specifically focused on microelectronics, which will have the ability to coordinate and facilitate breakthrough research in chip technologies. So thanks to the leadership and support from Chairman Manchin and Ranking Member Barrasso, our bipartisan bill was included in the CHIPS Act of 2022, which, again, we passed yesterday and the House should pass today.

So Ms. Speakes-Backman, a few logistical questions for you. If the Micro Act is signed into law, as expected, will you commit to

ensuring that the Department submits a request to the Appropriations Committee and our offices to explain what resources the Department needs to stand up these programs in Fiscal Year 2023?

Ms. SPEAKES-BACKMAN. First of all, thank you, sir, for your question. Thank you for your leadership and yes.

Senator KELLY. Thank you.

And will you commit to ensuring that your office and the entire Department will work to quickly stand up these critical programs as soon as the funding is available?

Ms. SPEAKES-BACKMAN. Yes.

Senator KELLY. As you know, much of the CHIPS Act funding, including for R&D, goes to support efforts at the Department of Commerce. Could you explain what special research capabilities the Department of Energy possesses which will help discover the next generation of microelectronics?

Ms. SPEAKES-BACKMAN. Thank you for the question and yes, we agree with you that domestic manufacturing and innovation needs to come back home, and I will say that the Office of Science at the Department of Energy has a particularly unique position to help to support the advancement of microelectronic technologies over the coming decades. And we look forward, within the Office of Energy Efficiency and Renewable Energy, to supporting and coordinating with the Office of Science and the other offices with equities in microelectronic technologies to bring those to bear.

Senator KELLY. Well, thank you.

This is so critical we get this done. I mean, our national security is at risk. There is no question about that. And this vote that is going to take place this afternoon in the House, you know, it is unclear which way this is going to go. But I am hopeful that it is successful. If we do not lead on microelectronics, another country will. China is attempting to become a leader in microelectronics. Note the ten-nanometer chip they can currently make. Their capacity to make a lot of them will continue to increase. We are the best innovators in the world. We have to continue to innovate in this space. These things go in all of our weapon systems and consumer electronics. This is critical that we bring down costs.

So I know this is not, you know, your issue. This is for the House of Representatives right now to get this across the finish line. But thank you.

Senator HEINRICH. Thank you, Senator.

Ranking Member Barrasso.

Senator BARRASSO. Thanks, Mr. Chairman. Just a couple quick questions.

So Mr. Navin, the Advanced Reactor Demonstration Program is an example of how the Federal Government can move ahead quickly and efficiently to execute new programs. So what can be learned from this experience with this program to ensure a domestic fuel supply for advanced nuclear reactors?

Mr. NAVIN. Thank you for the question, Senator.

Yes, you are absolutely right, the Advanced Reactor Demonstration Program really was a game changer in nuclear energy policy and it represented, I think, a great example of collaboration between the Congress, between the department, the Office of Management and Budget, and all of the stakeholders that had opinions

about this program. ARDP was launched in December 2019. The funding opportunity announcement was made in May 2020 and the awards were made in October 2020. So 10 months after it was signed into law, they got the FOA together, they collaborated with their colleagues at OMB, made sure Congress was comfortable with it, moved forward, solicited the responses, had a public-sector review process, a private-sector review process, and made those awards in 10 months.

Today is the 18-month anniversary of the Advanced Nuclear Fuels Availability Act being signed into law, and we are still waiting on the FOA. And it does not actually take—people who follow this issue, you can look at the budget justifications, you can look at the Congressional, or the Appropriations report language. You can see that there is some tension and disagreement between various stakeholders within the government. And I understand that process. I spent more than a decade and a half in government. But what we really need is leadership, because for industry's point of view, I don't really care if it is this person's fault, this agency's fault, you know, this Committee's fault, it is a failure of the Federal Government. And what we really need is leadership—somebody to pull those stakeholders together and say, we are facing a crisis, we need to get this thing out as quickly as possible.

So I appreciate the Committee's leadership to pass that bill. We do need to see leadership to get everybody together to get the program launched.

Senator BARRASSO. Thank you.

Mr. Leuck, Neste is the world's largest producer of renewable diesel and sustainable aviation fuel. Currently, Neste takes renewable diesel from Singapore to the United States while the facilities in Singapore use feedstocks from the United States, and I understand that Neste is interested, actually, in bringing jobs here. Would you discuss the interest in investing in renewable diesel production here in the United States?

Mr. LEUCK. You know, I think the biggest thing right now is the pending establishment of a joint venture in California to take what was a petroleum refinery and convert it to renewable diesel. So right there, there is a large investment on our part to bring that production here, stateside, which will also create jobs there. And then on the feedstock side you mentioned, through acquisitions of other companies, like Mahoney Environmental or Agri Trading, we can take our resources and help grow them and expand them much more quickly than they could on their own. So growing the footprint on both the production and feedstock side is big for us.

Senator BARRASSO. Great.

And Mr. Chairman, just finally, I have nine letters of support from a total of 42 different organizations expressing their support for my nuclear legislation. They recognize the importance of ensuring advanced reactors have a domestic supply of high-assay low-enriched uranium. I ask unanimous consent to enter all nine letters.

Senator HEINRICH. Without objection.

Senator BARRASSO. Thank you.

[The letters referred to follow:]

July 26, 2022

The Honorable Charles Schumer
Majority Leader
United States Senate
U.S. Capitol
Washington, D.C. 20510

The Honorable Nancy Pelosi
Speaker
United States House of Representatives
U.S. Capitol
Washington, D.C. 20515

The Honorable Mitch McConnell
Minority Leader
United States Senate
U.S. Capitol
Washington, D.C. 20510

The Honorable Kevin McCarthy
Republican Leader
United States House of Representatives
U.S. Capitol
Washington, D.C. 20515

Dear Leader Schumer, Speaker Pelosi, and Leaders McConnell and McCarthy,

We, the undersigned organizations, implore Congress to take action to strengthen U.S. national, economic, and energy security by passing legislation to assist in establishing a secure nuclear fuel supply. A prescription like that contained in the bipartisan *International Nuclear Energy Act of 2022* (S. 4064) would be an important first step. This bipartisan bill would, in part, establish a Nuclear Fuel Security Program to enhance domestic production of low-enriched uranium for existing reactors and high-assay, low-enriched uranium for use in advanced reactors. We also support the *Fueling our Nuclear Future Act of 2022* (S. 4066), which would accelerate the availability of High Assay Low Enriched Uranium for next-generation nuclear fuel and would spur the establishment of uranium enrichment and deconversion capability in the United States.

Our organizations are committed to working with the U.S. government to strengthen all stages of our nuclear fuel supply chain to establish a secure supply of uranium, uranium conversion, and uranium enrichment capabilities to meet needs of both today's reactors and next-generation facilities. The establishment of a secure fuel supply will enable the U.S. to eliminate the import of uranium and related conversion and enrichment services from the Russian Federation.

There is a pressing need for public-private partnerships to diversify the supply chain and alleviate the national-security issues associated with dependence on Russian nuclear fuel imports. The goal to eliminate the import of Russian fuel as soon as possible requires government and industry to work together to maintain nuclear generation as the backbone of the grid and to protect U.S. security interests.

We urge you to act quickly to enhance domestic nuclear fuel production and, in doing so, reduce our dependence on non-allied foreign sources, strengthen our energy position internationally, and create and preserve thousands of high-quality prevailing wage jobs.

Thank you for your consideration.

Yours very sincerely,

Alpha Tech Research Corp.	Orano USA
American Electric Power Company	Pacific Gas & Electric Company
American Nuclear Society	Peninsula Energy
ARC Clean Energy, Inc.	Public Service Enterprise Group Inc.
Cameco Corp.	Radiant
Centrus Energy Corp.	South Texas Project Nuclear Operating Company
ClearPath Action	Southern Company
Constellation Energy Corp.	TerraPower
ConverDyn	U.S. Chamber of Commerce
Dominion Energy	UCAN-Power
DTE Energy	United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry
Duke Energy Corp.	United States Nuclear Industry Council
enCore Energy	Uranium Energy Corp.
Energy Harbor	Uranium Producers of America
Framatome	Ur-Energy
Global Laser Enrichment	Westinghouse Electric Company
International Brotherhood of Electrical Workers	Women in Nuclear
Kairos Power	Xcel Energy
North America's Building Trades Unions	X-energy
Nuclear Energy Institute	
Nuclear Matters	
Oklo	

c: The Honorable Jennifer Granholm, Secretary of Energy
Members of Congress

American Nuclear Society 708-352-6611
555 N. Kensington Ave. askanything@ans.org
La Grange Park, IL 60526 ans.org



July 14, 2022

The Honorable John Barrasso
Ranking Member
U.S. Senate Energy and Natural
Resources Committee
307 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Ranking Member Barrasso:

As the premier professional organization representing 10,000 nuclear engineers, scientists, and technologists, who embrace the vital contributions that nuclear technologies make to improving people's lives, the [American Nuclear Society](https://www.ans.org/) (ANS) urged the United States Congress to take swift action to address the lack of a secure and reliable source of fuel for advanced reactors in a letter late last year.

With the recent introduction of Fueling our Nuclear Future Act of 2022, ANS applauds Senator Barrasso's effort to accelerate the availability of HALEU and the establishment of enrichment and deconversion capability in the U.S.

Establishing a domestic high assay low enriched uranium (HALEU) fuel production capability is critical to sustained U.S. leadership in the intensifying global competition to design and build advanced reactors. HALEU is currently available from only two sources: (i) limited amounts from the DOE via down-blending of existing stockpiles of material and (ii) Russia. Without a substantial domestic HALEU enrichment capability, we risk not having the fuel needed to power advanced nuclear energy as part of our clean energy future. Long-term reliance on Russian state-owned uranium producers exposes our largest carbon-free energy source to unacceptable business and political risk. The maturation of new nuclear technologies and advanced reactor designs underscores the need for securing our domestic nuclear fuel supply chains. Many advanced reactors, including many of the Advanced Reactor Demonstration Program (ARDP) awardees, will require HALEU and fuel forms very different from those currently manufactured for Light Water Reactors (LWRs). Without a clear pathway to obtaining HALEU, these projects are at risk of schedule delays. A domestic supply of HALEU will also help to fuel the decarbonization of our economy while creating good-paying jobs in the nuclear energy industry and mining sectors.

Fueling our Nuclear Future Act would prioritize HALEU availability from DOE inventories in the near term and establish HALEU enrichment and deconversion capability in the U.S. These efforts combined are essential to the success of the ARDP demonstration projects and other privately funded advanced reactor efforts that require HALEU.

In the near-term, the bill establishes achievable and appropriate targets for HALEU availability from DOE inventories and authorizes the necessary funding through FY2027. Downblending of high enriched uranium will produce HALEU that can be utilized by all advanced reactors and fuel fabricators.

American Nuclear Society 708-352-6611
555 N. Kensington Ave. askanything@ans.org
La Grange Park, IL 60526 ans.org



In the longer term, the bill requires the establishment of a domestic HALEU capacity of not less than 20 MTU per year to be on-line by December 31, 2027. This level of capacity is consistent with the input provided to the Department of Energy's HALEU Request for Information and will provide a strong base capacity that can be expanded as needed.

Please send any questions to ANS Director of Public Policy, John Starkey at jstarkey@ans.org.

Sincerely,

Steven A. Arndt

A handwritten signature in black ink that reads "Steven A. Arndt".

President
American Nuclear Society

Craig H. Piercy

A handwritten signature in black ink that reads "C. H. Piercy".

Executive Director/CEO
American Nuclear Society



Daniel B. Poneman
President & Chief Executive Officer

(301) 564-3300 phone
(301) 564-3201 fax

May 27, 2022

Senator John Barrasso
Ranking Member
Senate Committee on Energy and Natural Resources
307 Dirksen Senate Office Building
Washington, DC 20510

Dear Senator Barrasso:

I write in strong support of the *Fueling Our Nuclear Future Act of 2022* (S.4066), which provides robust authorization and support for programs to produce High Assay, Low Enriched Uranium (HALEU) – a commodity that is essential to the success of America’s advanced nuclear industry.

As our nation grows its clean energy economy, advanced nuclear reactors will play a key role in producing carbon-free baseload electricity and industrial process heat. Of the ten reactor designs being funded under the Department of Energy’s Advanced Reactor Demonstration Program (ARDP), nine will require HALEU-based fuel, as will many others outside of the ARDP. Unfortunately, today’s options for obtaining HALEU are extremely limited, with the U.S. Government having some ability to provide modest quantities and the only commercial source being in Russia.

For our advanced reactor industry to flourish, it must have a reliable and trustworthy domestic supply of HALEU, both now and in the future. The *Fueling Our Nuclear Future Act of 2022* solves this problem by authorizing major development programs to jumpstart HALEU production in the United States, including the establishment of a domestic uranium enrichment enterprise. As was done in the 1950s, at the dawn of the modern commercial nuclear power era, this government investment will help catalyze the creation of a vibrant advanced nuclear fuel supply chain, to power these advanced reactors and allow them to be deployed worldwide.

Centrus Energy is our nation’s leading developer of cutting-edge uranium enrichment technology and has been working closely with the Department of Energy on a HALEU enrichment demonstration program that soon will be producing useful quantities of HALEU. But much more HALEU enrichment capacity is needed, and the provisions of the *Fueling Our Nuclear Future Act of 2022* will fill that void. Once enacted, Centrus looks forward to competing for the opportunity to deploy our world-leading uranium enrichment technology as part of an all-American advanced nuclear fuels industry.

Thank you for your leadership on this critical issue; I look forward to working with you and other Members of Congress on this important legislation.

Sincerely yours,

Daniel B. Poneman

cc: Senator Joe Manchin, Chairman
Senate Committee on Energy and Natural Resources



Maria Korsnick
 President and CEO
 1201 F Street NW, Suite 1100
 Washington, DC 20004

202.739.8187
 mgk@nei.org
 nei.org

NUCLEAR
 CARBON-FREE ENERGY

May 4, 2022

The Honorable John Barrasso
 Ranking Member
 Committee on Energy and Natural Resources
 U.S. Senate
 307 Dirksen Senate Building
 Washington, D.C. 20510

Dear Ranking Member Barrasso,

We write you to express our support for the *Fueling our Nuclear Future Act of 2022*. We strongly support the effort to accelerate the availability of High Assay Low Enriched Uranium (HALEU) and the establishment of enrichment and deconversion capability in the United States.

The United States leads the world in technology innovation with more developers of advanced reactors than any other country, all while global competition is intensifying to design and build advanced reactors. Establishing a domestic HALEU fuel production capability now is critical to continued U.S. leadership in this emerging market sector and to advancing vital strategic interests. In addition, many advanced reactors, including many of the Advanced Reactor Demonstration Program (ARDP) awardees, will require HALEU and fuel forms very different from those currently manufactured for Light Water Reactors (LWRs). Without a clear pathway to obtaining HALEU, these projects are at risk of schedule delays.

The bill prioritizes making HALEU available from DOE inventories in the near term and the establishment of HALEU enrichment and deconversion capability in the U.S. These efforts combined are essential to the success of the ARDP demonstration projects and other privately funded advanced reactor efforts that require HALEU.

In the near-term, the bill establishes achievable and appropriate targets for HALEU availability from DOE inventories and authorizes the necessary funding of \$200 million a year through FY 2027. Downblending of fresh high enriched uranium will produce HALEU that can be utilized by all advanced reactors and fuel fabricators.

In the longer term, the bill requires the establishment of a domestic HALEU capacity of not less than 20 MTU per year to be on-line by December 31, 2027. This level of capacity is consistent with the industry's input to the Department's HALEU Request for Information and will provide a strong base capacity that can be expanded as needed. The bill also increases the authorized funding level in the Energy Act of 2020 to an appropriate level of \$150 million a year through FY 2032.

The Honorable John Barrasso
May 4, 2022

The *Fueling our Nuclear Future Act of 2022* is an important step in establishing a domestic HALEU infrastructure, rebuilding our nuclear industrial capabilities, and ensuring the success of advanced reactors that require HALEU. We look forward to working with you and other members on this bill.

Thank you for your consideration.

Yours very sincerely,

A handwritten signature in cursive script that reads "Maria Korsnick".

Maria Korsnick

c: The Honorable Joe Manchin, Chairman, Senate Energy and Natural Resources Committee



July 19, 2022

Senate Committee on Energy and Natural Resources
304 Dirksen Senate Building
Washington, D.C. 20510

Dear Senators Manchin and Barrasso:

The Nuclear Innovation Alliance (NIA) is writing to support your continued leadership and continued progress on legislation to ensure availability of high-assay, low-enriched uranium (HALEU) fuels for advanced reactors. A mature, sustainable, and domestic HALEU industry is critical to successful development and deployment of U.S. advanced reactors both here and abroad. Federal leadership and support to catalyze HALEU market development is invaluable in accelerating the commercial deployment of advanced nuclear energy.

NIA believes that advanced nuclear energy can play a vital role in our nation's energy and economic future. Nuclear energy is already the largest source of clean energy in the United States and meeting future clean energy goals will require a massive build out of all clean energy technologies – including nuclear energy. Advanced nuclear energy is well suited to complement variable renewable technologies and provide the firm clean energy needed to achieve deep decarbonization. Highly reliable and dispatchable electricity and process heat will enable all parts of the U.S. economy to efficiently meet our clean energy goals. Domestic deployment of advanced nuclear energy will enhance U.S. energy security and provide economic benefits as we build out supply chains for advanced reactors. These reactors could replace retiring fossil fuel sites, presenting economic opportunities for local communities by providing higher paying jobs and increasing local reliable energy generation. TerraPower's Sodium reactor demonstration project highlights the potential opportunity for advanced reactors to benefit local communities. Finally, export of advanced reactors will be critical to addressing the growing global demand for energy while meeting global climate targets. Export of U.S. nuclear technology increases our ability to set norms for nuclear safety and nuclear non-proliferation around the world.

The successful development and deployment of advanced nuclear reactors, however, may be limited by the commercial availability of HALEU fuels. The only current commercial supplier of HALEU fuel is the Russian state-owned enterprise TENEX. Reliance on a single, foreign, state-owned company creates significant economic and political risks. The February 2022 Russian invasion of Ukraine and the resulting geopolitical and commercial uncertainty is a stark example of the impact of this monopoly and demonstrates that overreliance on TENEX as a short-term or long-term fuel cycle partner is untenable. A domestic, diverse, reliable, and commercially viable HALEU fuel cycle is essential for the successful deployment of advanced reactors.

Strong federal policy, leadership, and investment can help jumpstart HALEU fuel cycle activities. The federal government should create a guaranteed market for initial HALEU production and help establish a guaranteed supply of HALEU for advanced reactor developers and utilities. Significant federal investment would establish market confidence and facilitate private investment in new HALEU production infrastructure to catalyze development of a mature and sustainable commercial market. This federal investment would be small compared to the enormous climate, energy security, and economic benefits of successful advanced reactor commercialization. Failure to ensure short-term or long-term HALEU availability risks not only the \$5 billion the United States has already invested in the development of advanced reactors but also risks continued U.S. leadership internationally on the security and safety of nuclear technology. Successfully catalyzing development of a mature commercial market could accelerate the deployment and export of U.S. advanced nuclear technology around the world. Additional details on developing a mature commercial HALEU market can be found in the April 2022 NIA report "[Catalyzing a Domestic Commercial Market for High-Assay, Low-Enriched Uranium \(HALEU\)](#)".

The Nuclear Innovation Alliance supports the Senate's continued leadership on advanced nuclear fuel availability and encourages it to provide legislative authorizations and funding to accelerate commercial availability of HALEU fuels. Your continued leadership and support for federal investments in HALEU can unlock U.S. nuclear energy innovation. We look forward to continued work with you and other members of Congress on HALEU and advanced nuclear energy legislation.

Sincerely,



Judi Greenwald
Executive Director
Nuclear Innovation Alliance



Orano USA LLC
Corporate Office
4747 Bethesda Avenue
Suite 1001
Bethesda, MD 20814
Tel: 301-841-1600
Fax: 434-260-8480

May 26, 2022

Senate Energy and Natural Resources Committee
304 Dirksen Senate Building
Washington, DC 20510

Dear Senators Manchin and Barrasso:

We offer our appreciation for the work of the Senate Energy and Natural Resources Committee to sustain and expand the broad benefits delivered by the American nuclear energy fleet. The United States represents the world's largest operating nuclear fleet – a vibrant market characterized by safety, operational leadership and technological innovation. At Orano, improving the world through the broad utilization of nuclear technology and materials is our animating organizational goal, and the Committee's policy support has been vital in charting paths for new nuclear technologies and applications.

In order to meet global threats and solve our ecological challenges, increased utilization of nuclear energy is needed. Delivering nuclear solutions at appropriate scale will require significant capital investment over the balance of this decade to establish the industrial infrastructure needed to fuel this future. These investments must deliver a diverse, geopolitically stable supply chain.

Orano strongly supports efforts to accelerate the commercial availability of High Assay Low Enriched Uranium (HALEU), and the establishment of enrichment and deconversion capabilities in the United States. Our detailed perspectives on the subject can be found in our response to the DOE's Request for Information, which is included as an attachment for reference. We support the Fueling our Nuclear Future Act of 2022, which updates commercial HALEU production targets, recognizes the need for a flexible platform for chemical deconversion, and authorizes programmatic funding to establish a capacity threshold of 20MT of HALEU by the end of 2027.

As an industrial operator, Orano is confident that the commercial technology within our portfolio can cost-effectively meet HALEU production needs at any foreseeable commercial scale. However, without the assurance of sufficient initial commercial offtakes, the costs and risks of private capital investment in HALEU production are prohibitive. Ultimately, it will be essential for the DOE to organize the appropriate financial signals that create a predictable basis for a vibrant, self-sustaining commercial market. Delays in the clarity of these financial signals will contribute to delays in the availability for industrial HALEU capacity. The Fueling our Nuclear Future Act of 2022 is an important step needed to urgently organize commercial investment.

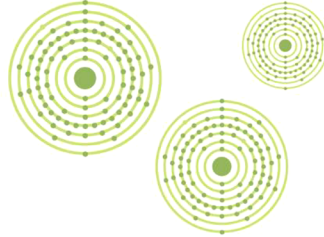


We thank you again for your focus and leadership on these important issues, and stand ready to work in partnership with U.S. government and industry to accelerate the availability of these essential capabilities.

Yours sincerely,

A handwritten signature in black ink, appearing to read "A Vexler".

Amir Vexler
Chief Executive Officer
Orano USA LLC



May 24, 2022

The Honorable John Barrasso
Ranking Member
Committee on Energy and Natural Resources
U.S. Senate
307 Dirksen Senate Building
Washington, D.C. 20510

Dear Ranking Member Barrasso,

I write in support of the *Fueling Our Nuclear Future Act of 2022*. I strongly support the effort to establish and accelerate the availability of High-Assay Low-Enriched Uranium (HALEU), an essential fuel that will power TerraPower's Sodium reactor, which is rapidly approaching deployment in the United States within this decade.

TerraPower is one of two competitively selected Advanced Reactor Demonstration Projects (ARDP) in a public-private cost-shared partnership with the U.S. Department of Energy (DOE). TerraPower will license, construct, and demonstrate our advanced Sodium reactor by 2028 near a retiring coal power plant in Kemmerer, Wyoming. Sodium is a sodium-cooled fast nuclear reactor that leverages decades of development and design undertaken by TerraPower and its partner, GE-Hitachi. The high-operating temperature of Sodium, coupled with an innovative molten salt thermal energy storage system, will allow Sodium to provide clean energy while also supporting the increased use of renewable energy, such as wind and solar power. As a new and innovative design, Sodium requires the use of HALEU as fuel, which will enable the reactor to produce energy more efficiently while reducing the volume of waste compared to today's operating nuclear fleet.



Unfortunately, there is no clear pathway to obtaining domestically produced HALEU for Natrium. HALEU is necessary not just for Natrium but also for the entire fleet of next-generation advanced nuclear reactors that will provide clean and reliable energy. Establishing a healthy and robust commercial HALEU supply chain within the United States should be the top priority for DOE. To address this, DOE should move expeditiously to engage with the civil nuclear industry and Congress on a comprehensive and strategic plan that will outline a path toward domestic HALEU production. *The Fueling Our Nuclear Future Act of 2022* proposes solutions to address this by ensuring HALEU will be available, helping to keep Natrium on schedule.

The measures proposed in the *Fueling Our Nuclear Future Act of 2022* will make significant progress in expediting the development of a domestic commercial supply chain and infrastructure for HALEU in the United States. Thank you for your leadership and support on this issue, and I look forward to working with you and other members on this bill.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Levesque".

Chris Levesque
President & CEO

cc: The Honorable Joe Manchin, Chairman, Senate Energy and Natural Resources Committee



URANIUM PRODUCERS OF AMERICA

1925 ASPEN DRIVE, 200A, SANTA FE, NEW MEXICO 87505
TELEPHONE (505) 690-7709; WWW.THEUPA.ORG

May 4, 2022

Chairman Manchin and Ranking Member Barrasso,

On behalf of the Uranium Producers of America (UPA), I write to express the UPA's support for S.3856, a bill to prohibit the importation of uranium from the Russian Federation; S.3978, the NO RUSSIA Act of 2022, and S.4066, the Fueling Our Nuclear Future Act of 2022. This package of legislation introduced by Senator John Barrasso represents a comprehensive approach to shoring up a secure nuclear fuel supply chain in America, the urgency of which has increased with Russia's invasion of Ukraine. We urge you to schedule these bills for consideration by the Senate Energy and Natural Resources Committee.

U.S. nuclear utilities purchase nearly half of the uranium they consume from state-owned entities (SOE) in Russia, Kazakhstan, and Uzbekistan. Russia's invasion of Ukraine has increased the urgency of ending this uranium import reliance, which threatens our national security and props up the Putin regime. S.3865 will halt the flow of U.S. dollar uranium purchases to the Russian State Atomic Energy Company, or ROSATOM, an extension of the Kremlin and the Russian military. UPA's member companies stand ready to work with U.S. utilities and other Western uranium suppliers to ensure every single domestic reactor will be able to maintain operations as the U.S. economy increasingly relies on reliable, clean nuclear power.

The NO RUSSIA Act (S.3978) would help kick start the domestic uranium production industry through the implementation of the Strategic Uranium Reserve (the "Reserve"). The Reserve was recommended by the federal interagency Nuclear Fuel Working Group (NFWG) led by the Department of Energy (DOE) and received initial funding from Congress in FY 2021. The Reserve was created precisely to counter the influence of SOE's and hedge against potential international uranium supply disruptions, the risk of which is heightened because of Russia's invasion of Ukraine. S.3978 would help provide this program the long-term budget certainty recommended by the NFWG that will give DOE the most effective tool to stimulate U.S. production.

Finally, the Fueling Our Nuclear Future Act of 2022 (S.4066) will help secure our clean energy future by ensuring a domestic supply of high-assay low-enriched uranium (HALEU), the fuel necessary for the next generation of advanced nuclear reactors. Unfortunately, the only current source of HALEU is Russia. S.4066 directs DOE to take swift action to develop domestic alternatives lest advanced nuclear projects that have received substantial taxpayer support be entirely dependent on Russian-supplied fuel. This includes making HALEU derived from existing federal inventories available to advanced reactors until domestic enrichment capabilities can be

established to meet demand. The domestic mining and conversion industries have ample capacity to produce material to replenish these inventories for future requirements.

Thank you for your consideration. We are eager to work with you on this legislation as it makes its way through the legislative process.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jon J. Indall". The signature is fluid and cursive, with a large initial "J" and "I".

Jon J. Indall
Counsel for UPA



X Energy, LLC
801 Thompson Avenue
Rockville, MD 20852
+1 301.358.5600

June 2, 2022

The Honorable John Barrasso
Ranking Member
Senate Energy and Natural Resource Committee
Washington, DC 20005

Dear Senator Barrasso,

X-energy would like to recognize and thank you for your leadership and commitment in support of US leadership in the deployment of next generation of nuclear reactors. The Fueling Our Nuclear Future Act of 2022, S4066, recognizes the urgency of building the front end of the fuel infrastructure to provide a domestic supply for High Assay Low Enriched Uranium (HALEU) to ensure operations of these reactors as quickly as possible and provide the development of the long-term capacity needed for operating the plants over their lifetime.

The United States made a bold and innovative policy decision to accelerate the deployment of advanced nuclear energy technology by moving forward with the Advanced Reactor Demonstration Program. X-energy was selected as one of two competitively awardees to demonstrate an advanced reactor. This is a 50-50% public private partnership with the government. The biggest risk to raising private funds and obtaining a customer commitment is the lack of US supplied HALEU for the life of the plant. Robust funding for the program is urgently needed to ensure program execution of both ARDP Pathway 1 demonstrations. These projects will require initial HALEU several years ahead of their 2027-2028 deployment schedules for their initial core, but just as crucial is a clear pathway to the availability of fuel for the lifetime of the project. This is an issue even with the potential customers of the Pathway 1 demonstrations, as well as any future customers that would consider buying these advanced reactors. Failure by the government to act on development of a domestic enrichment capability jeopardizes not only the more than \$5 billion that the US Government has invested in getting these first reactors to market, but potentially threatens future business opportunities for advanced reactors and US global leadership in nuclear energy. Every day the Administration and Congress delay moving forward, we put this plan at risk with a day-for-day delay in schedule deployment. We have a window of opportunity right now and we must seize it, and provide the infrastructure and supply chain necessary to be successful to bear the benefits of advanced nuclear energy by the end of this decade and, then, through the rest of the 21st century.

X-energy supports the creation of a HALEU bank to enable the commencement of developing this critical US capability as quickly as possible, while ensuring fuel available for the initial fueling of the ARDP reactors. We believe it is in the national interest to ensure the availability of HALEU for civilian domestic research, development, demonstration, and commercial use.

Sincerely,

A handwritten signature in blue ink that reads 'Clay Sell'.

Clay Sell
Chief Executive Officer
X-energy, LLC

Senator HEINRICH. Mr. Leuck, can you walk us through, again, what the current feedstocks that your technology uses are?

Mr. LEUCK. Sure. So waste and residues, basically. Things that have reached the end of their first useful life.

Senator HEINRICH. But more specifically?

Mr. LEUCK. Yes, primarily used cooking oil, tallow, fish oil, technical corn oil, which is a byproduct of ethanol production. Those are the current pathways we are using in the United States.

Senator HEINRICH. And how do those scale to demand? For feedstocks like that, if you had unlimited ability to produce, would you have the feedstocks to be able to produce at scale?

Mr. LEUCK. At some point, there is only so much waste and residue in the fats, oils, and greases world, right?

Senator HEINRICH. And so, then you transition to what feedstock?

Mr. LEUCK. Yes, but we are not there yet.

Senator HEINRICH. Okay.

Mr. LEUCK. But then after that, the technologies I mentioned to Senator King would be lignocellulosic and useful solid waste. That is kind of the next generation, and beyond that, there is even algae or e-fuels, or carbon capture fuel production. So there is a long runway of technology that is not just limited to what we are using now.

Senator HEINRICH. I got you.

Mr. Navin, I know, you know, you are still relatively early in this process, but is there a target price for your technology in terms of price per kilowatt-hour that you think you can achieve once you are standing up multiple small modular reactors?

Mr. NAVIN. Yes, so our nth-of-a-kind target price, so I am going to answer that in two ways, if I can. So we think that our plant, 345-megawatt baseload with the ability to store 500 megawatts of electricity for up to five and a half hours, is going to be at about a billion dollars, which is obviously a lot of money, but for utilities, that is not something that they would blink at. And given that energy storage component being baked into it, we think that that is a really attractive value proposition to our customers and utilities.

With the LCOE, you know, which is, kind of, an imperfect—

Senator HEINRICH. Levelized cost.

Mr. NAVIN. Of these things, but the levelized cost of electricity, we think, will be in the low \$50 per megawatt range, between \$50 and \$60, but on the lower end, closer to \$50. That includes—

Senator HEINRICH. Kilowatt-hour?

Mr. NAVIN. Correct.

And that includes the integrated energy storage piece as well. So it is not just the production of the electricity, but that includes the—

Senator HEINRICH. So, including storage?

Mr. NAVIN. Correct, sir.

Senator HEINRICH. Well, I want to thank all our witnesses for joining—

Senator KING. Mr. Chairman.

Senator HEINRICH. Yes.

Oh, sorry. Senator King, go right ahead.

Senator KING. Well, I wanted to follow up on those questions. My father used to say the Pentagon was the only building in the world where as you drove straight toward it, it kept getting further away. And that is sort of the way I feel about modular nuclear power. We have been driving toward it for a long time. When? How close are we? I will ask both Ms. Huff and you, Mr. Navin. Are we three years away, five years away, ten years away? Because clearly, this could be a huge part of our energy future if—and the cost has been the principal barrier in the past. How close are we?

Mr. NAVIN. So our project is being built as part of the Department of Energy's Advanced Reactor Demonstration program, which came out of this Committee. It requires us to build our reactor within seven years of assigning our agreement with DOE, which happened in May 2021. So our plan is to bring that plant online by 2028 just outside of Kemmerer, Wyoming. We are working on the site today. And as I mentioned in my testimony, the long pole in the tent, the thing that could prevent us from getting there is fuel. We do not currently have a pathway to that fuel because of the Russian invasion of Ukraine and our decision to not purchase our first core load of fuel from Russia.

So the bills that are being considered today to expedite the fuel availability program and to make HALEU available, our fuel available from excess stockpiles of HEU could help solve that problem. But our in-service date is planned on 2028 at which point we will turn the power plant over to our customer at Rocky Mountain Power/PacificCorp and they will own and operate that plant. It has a licensed life of 60 years with the ability to extend that for another 20.

Senator KING. What do you expect cost per kilowatt-hour?

Mr. NAVIN. As we just talked about, in the low \$50—\$50 to \$60, but we think we can get below \$55 a megawatt-hour, but that includes a massive amount of integrated energy storage on top of that price.

Senator KING. Thank you.

Ms. Speakes-Backman, your title is Energy Efficiency and Renewable Energy. The cheapest and least polluting kilowatt-hour is the one we do not use. So I hope you do not lose sight of the efficiency side of your job. Weatherization, to me, is so important. We do LIHEAP in New England. It is critical to controlling people's heating bills, but it would be really nice to do something that is not an annual subsidy that will allow them to reduce their heating bills through weatherization programs. So I hope you will give some emphasis to energy efficiency and weatherization.

Ms. SPEAKES-BACKMAN. Thank you for your sentiment, sir, and thank you for the question. I could not, again, could not agree with you more in that efficiency is the least expensive energy that we can procure—by not using it in the first place, and part of that is yes, through technologies that can work more efficiently to heat and cool our buildings and to provide water. But the other part is insulation, and we are working on—

Senator KING. Pretty mundane stuff, but it makes a huge difference.

Ms. SPEAKES-BACKMAN. Really mundane stuff.

Senator KING. Storm windows.

Ms. SPEAKES-BACKMAN. Yes, absolutely. I was just speaking with some folks about tips on how to save energy and there are programs that are available to folks, like LIHEAP, like the Weatherization Assistance Program, but there are also just really inexpensive ways that we can save money like, for example, close your shades in the afternoon. And I think that is an important message that we need to make sure that we are taking to the American people, that there are programs that we can provide and there are things that we can do to help. We can make it easier for folks to access. We can help improve their homes so that they can access these programs. But there is also a responsibility, I believe, that the Federal Government has, frankly, to make sure that we are helping people understand the everyday things that they can do.

Senator KING. Well, one barrier though is the initial capital cost for the homeowner, and there have been programs around the country where the utility company, for example, provides the financing and then it is paid back in the electric bill. We have to be creative about that because people may say, well, that is great, but I really can't spend \$4,000. I don't have it. So we need to figure out how to creatively finance that investment, which will pay back rather rapidly, but the initial capital investment is tough.

Ms. SPEAKES-BACKMAN. This is part of what I am so excited about, about this Weatherization Act that is being proposed, is that it helps not only to get people ready for weatherization, but also to be able to take advantage of other programs, where it is a step toward, really, coordinating across agencies of how people can more easily access these funding programs across, you know, across various programs, not having to—

Senator KING. And working with utilities because they already have a relationship with the customer.

Ms. SPEAKES-BACKMAN. Absolutely.

Senator KING. And the financial wherewithal.

Mr. Wech, I just wanted to ask one quick question. Transmission. Transmission in the future, it seems to me, is going to be a real issue and a necessity. Describe how tough it is or easy it is for you to build a major transmission line in your service area.

Mr. WECH. Thank you for the question, Senator.

Specifically, it is, I am going to be very brutal here. It is a challenge. There is, you know, there is the "not in my backyard" syndrome that we are up against for many folks and we have to work really—

Senator KING. They want the power in their backyard, but they do not want the lines to get it there.

Mr. WECH. Understood, yes, yes, I agree.

And so, what we continually are doing is, we are, you know, one of the best ways we can make forward progress on this is to continue to educate the consumers, educate the public on the value of the benefits of new transmission. New transmission brings a wealth of opportunities that you have already mentioned in renewable energy, which gets us, you know, further toward a carbon-free environment. We take advantage of the efficiencies that we are going to see with transmission moving renewables to various areas of the country where there is dire need. It is going to relieve trans-

mission congestion, which in turn, the congestion relief alone will lower market prices, which in the end, help the consumer.

So we are working all the time to educate and inform the public on the benefits of this, but I will tell you, it is an uphill challenge, but I think education and continued effort on our part gets us to the finish line.

Senator KING. Well, it would be helpful to us if you could supply us information about the challenge and suggestions you might have for streamlining permitting, for example, not ignoring environmental impacts, but for example, one-stop shopping on permitting so that you do not have to go from agency to agency. Your thoughts could be helpful to us. I hope you would supply them to the Committee.

Mr. WECH. I appreciate that comment, sir and yes, we would be happy to participate in that and provide information.

Senator KING. Thank you.

Thank you, Mr. Chairman.

Senator HEINRICH. Thanks to all our witnesses for joining us here today.

Members will have until close of business tomorrow to submit additional questions for the record.

This Committee stands adjourned.

[Whereupon, at 11:18 a.m., the Committee was adjourned.]

APPENDIX MATERIAL SUBMITTED

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to the Honorable Kathryn Huff

QUESTIONS FROM SENATOR JAMES E. RISCH

- Q1. If commercial supply of HALEU cannot come online in time to meet ARDP deployment timelines, will DOE make HEU available for downblending that can meet the initial core requirements for the two ARDP projects?
- A1. DOE and NNSA have been working together to identify a solution that would support ARDP projects while not adversely affecting national security missions. As part of this effort, NNSA evaluated its stocks of HEU and HALEU to identify potential options that could be re-directed to meet near-term ARDP fuel needs.

However, DOE/NNSA's enriched uranium inventory does not exist in a standing material reserve, nor in a form, assay, or location that permits near-term use. As such, DOE cannot easily make this inventory available for the ARDP projects. In addition, existing facilities lack the capacity to convert this HEU to usable LEU (including HALEU) in the quantities and timelines required by the ARDP projects. Installing new capacity would be extremely costly and could not be done in time to meet the ARDP schedule. Finally, because the United States no longer has the capability to enrich to HEU, downblending more of the existing NNSA HEU stocks, for use in the ARDP projects, creates significant risk and reduces longer-term national security options for DOE/NNSA nuclear weapons and nonproliferation missions.

DOE and NNSA have identified limited amounts of material that could be used by the ARDP projects, and shared this information with them. In addition, DOE and NNSA are continuing to search the DOE inventory of material for potential supply options and working to accelerate the establishment of a sustainable commercial HALEU supply to address the initial core load requirements for the ARDP projects. Investment in commercial HALEU enrichment and fuel production capabilities is likely to deliver the needed material more quickly than the investments required to access additional material from the DOE inventory.

- Q2. When will the Department make their plan for addressing HALEU publicly available?
- A2. With the resources now available from Section 50173 of the *Inflation Reduction Act*, DOE is assessing current plans for incentivizing a diverse and market-driven commercial HALEU supply chain.

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to the Honorable Kathryn Huff

- Q3. In November 2021, DOE published a Request for Information (RFI) on Using a Consent-Based Siting Process to Identify Federal Used Fuel Facilities. I understand that you received a significant number of responses and are in the process of further clarifying your intentions with respect to consent-based siting as a result.
- Q3a. What has the Department learned about Consent-Based Siting?
- A3a. The Notice of Request for Information on Using a Consent-Based Siting Process to Identify Federal Interim Storage Facilities (86 FR 68244) (RFI) was issued on December 1, 2021 and closed March 4, 2022. DOE also considered late submissions. DOE received over 220 submissions (totaling over 1,600 pages). The responses were received from Tribal, State, and local governments and organizations, as well as from a broad range of stakeholders including NGOs, industry, members of academia, and private citizens. The responses are available in their entirety on DOE's [website](#). DOE is finalizing analysis of the comments and plans to issue a summary report of our findings in the coming weeks. Information gathered from the 2021 RFI responses has been incorporated into DOE's next steps for consent-based siting, including a planned funding opportunity announcement (FOA) to support public engagement and capacity building around nuclear waste management and related topics.
- On consent and consent-based siting:
 - There is a general support for using a consent-based siting for interim storage facilities. DOE received comments on the need to define community and consent, and that consent should not be defined by the DOE, but rather by each community because a consent-based siting process is not one-size-fits-all.
 - Many commented on the roles of different jurisdictions in government in the consent-based siting process, and who should be authorized to consent. DOE also received comments on the relationship between local, State, Tribal, and Federal governments in the process. As with the definition of consent and community, there is no easy answer, and most likely these relationships will be case-specific.
 - Federally-recognized Tribes commented on their status as sovereign nations, and that the Department should work with Tribes on a government-to-government basis.
 - On the subject of removing barriers for meaningful participation:

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to the Honorable Kathryn Huff

- DOE received comments on the need for a fair process and re-building trust through that process. Commenters requested a flexible and adaptive process that is inclusive of a wide set of stakeholders.
 - DOE received some suggestions on what resources communities may need for informed consent, including direct funding to communities, municipalities, States, and Tribes to (1) enable meaningful participation; (2) enable independent oversight from communities; and (3) hire independent trusted experts to conduct evaluations.
 - DOE also received comments on the importance of intergenerational justice.
 - On interim storage and waste management:
 - Many commenters expressed concerns about how long an interim storage facility will last and the legality of interim storage under the *Nuclear Waste Policy Act* in the absence of a repository, as well as the need to address defense and DOE-managed spent nuclear fuel and waste.
 - DOE received comments on transportation of spent nuclear fuel. Some commenters expressed concerns, others recommended DOE continue planning and collaboration efforts between Tribal, State, local governments and the Federal government, leaning on collaboration with state and regional groups, DOE's National Transportation Stakeholders Forum, and the Tribal Radioactive Materials Transportation Committee, as well as learning from the best practices of projects such as DOE's Waste Isolation Pilot Plant's transportation program.
 - Many commenters also stressed the need to establish a new independent organization for nuclear waste management and to fix the nuclear waste fund.
- Q3b. Do you have any recommendations for things we can do in this legislation to improve prospects for a successful siting process?
- A3b. DOE currently has congressional authorization and funding to perform generic R&D related to disposal.

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to the Honorable Kathryn Huff

QUESTIONS FROM SENATOR JOHN HOEVEN

- Q1. What actions are being taken by the Department of Energy to strengthen our domestic nuclear fuel supply capabilities to reduce our dependence on Russia?
- A1. Without expansion of the domestic fuel cycle capacity, the U.S. cannot securely support the low enriched uranium (LEU) needs of today's reactor fleet or make high-assay LEU (HALEU) available for advanced reactors, research reactors, and medical isotope production. The Secretary has established a team of experts from across the Department to develop a strategy and uranium production to meet industry and government demands for enriched uranium. We have briefed congressional committees in both chambers on a potential strategy and will continue to work with Congress to provide information to meet this challenge. Prior to Russia's invasion of Ukraine, the Department was already working to address HALEU needs. The Department recently issued a request for proposals for a competitively awarded cost share procurement to complete construction and operate the centrifuge cascade at Piketon, Ohio, with options to continue to operate the cascade subject to appropriations. In addition, the President's Fiscal Year 2023 budget request proposes to make available small quantities of HALEU from limited non-defense DOE/National Nuclear Security Administration inventories and support the private sector in establishing a limited U.S. commercial HALEU production and supply chain capability.
- Q2. Does the Department of Energy support a ban on the importation of uranium from the Russian Federation?
- A2. DOE recognizes the need to reduce dependency on critical nuclear fuel supply imports from undependable sources and the importance of long-term policy certainty in this regard. We are continuing to evaluate policy options to achieve these objectives.

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to Ms. Kelly Speakes-Backman

QUESTIONS FROM SENATOR MAZIE K. HIRONO

- Q1. At a hearing of the Committee's Subcommittee on Energy on July 13, 2022, John Larsen of the Rhodium Group testified that, in the face of high prices at the pump, consumers are saving money thanks to higher efficiency standards for vehicles. Drivers of passenger vehicles and commercial trucks can now go further on a gallon of gas or bypass the fuel pump all together with an electric or other zero-emission vehicle. With the direction provided in S. 3543, the Vehicle Innovation Act, and with appropriate funding from Congress, what are some of the new technologies and fuel economy benefits that DOE's vehicle technologies program could deliver for drivers?
- A1. The Vehicle Innovation Act reauthorizes and complements much of the critical work already underway in the DOE's Vehicle Technologies Office (VTO), which works with manufacturers and suppliers to research, develop, and deploy advanced vehicle technologies that improve energy efficiency. The bill also provides DOE with clear direction to build on successful research programs and encourages the development of a wide array of technologies that have the potential to improve fuel efficiency and reduce wasted fuel and emissions arising from traffic congestion.
- VTO funds research, development, demonstration, and deployment of new technologies offering fuel economy benefits for all Americans, such as advanced battery technologies (for electric vehicles with fuel economies in excess of 100 mpg-equivalent, according to fueconomy.gov); advanced materials for lighter-weight vehicle structures and trains; energy efficient mobility technologies (in coordination with the Department of Transportation), including automated and connected vehicles as well as innovations in efficiency-enhancing connected infrastructure). VTO also supports research and development leading to new technologies that increase fuel economy in vehicles for moving America's freight through innovative powertrains that also reduce greenhouse gases (GHG) and criteria pollutants from hard to decarbonize off-road, maritime, rail, and aviation sectors.
- Q2. S. 3145 would permanently exempt exports of smaller amounts of liquified natural gas (LNG) from the Department of Energy's review of whether the exports are in the public interest. Under the bill, could LNG export companies break up export permits into multiple smaller petitions to circumvent DOE's public interest review under the Natural Gas Act?
- A2. S.3145 would codify DOE's 2018 rule on small scale natural gas exports. Should that occur, DOE would seek to develop relevant implementing regulations to ensure authorizations issued under S.3145 are not mis-used. For instance, under the 2018 rule, DOE has clarified that an authorization for small-

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to Ms. Kelly Speakes-Backman

scale exports does not give the applicant authority to exceed a liquefaction facility's authorized capacity; several of the small-scale applicants have requested to source volumes from one or more facilities that have received site authorizations from the Federal Energy Regulatory Authority (FERC). In those instances, DOE has clarified that authorizations under the 2018 rule cannot allow the FERC- authorized capacities of the liquefaction facilities that may be the source of the small volume exports to be exceeded.

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to Mr. Jeff Navin

Questions from Senator James E. Risch

Questions: TerraPower and the industry have recommended downblending of weapons surplus HEU to produce HALEU for first cores. How much HEU do you think will need to be downblended? How much HEU do you think the Department has available?

Answer: TerraPower only seeks to downblend HEU to HALEU for the first core of the Natrium reactor, while the Department of Energy (DOE) stands up the HALEU Availability Program and enables a commercial uranium enrichment supply chain within the United States. TerraPower's Natrium reactor will require 15 MTUs of HALEU enriched to 19.75% for the first core. Assuming that the HEU has an enrichment level at 93% or above, TerraPower estimates the amount of HEU needed for the downblending is less than 3.2 MTU (metric ton uranium) to produce 15 MTUs of HALEU. So long as the Department acts expeditiously to establish the Advanced Nuclear Fuel Availability Program, we will not need downblended HEU for any future core loads. That said, the only path to maintain the ARDP schedule mandated by Congress involves downblending DOE material for the initial core load.

Furthermore, the nation's stockpile of HEU is managed by the DOE's National Nuclear Security Administration (NNSA), and the contents and quantity of its inventory are classified. However, in 2016, the Obama Administration released and declassified data on the national inventory of HEU as it stood in 2013. As of September 30, 2013, the total HEU inventory was 585.6 metric tons, and 41.6 metric tons were listed as available for downblending at that time. We encourage you to contact NNSA to inquire about a more up-to-date accounting of their complete HEU inventory, which they can provide for you in a classified briefing.

U.S. Senate Committee on Energy and Natural Resources
July 28, 2022 Hearing: *Pending Legislation*
Questions for the Record Submitted to Mr. Matt Leuck

Questions from Senator Cindy Hyde-Smith

Question 1: Mr. Leuck, your testimony states that there is no consumer benefit to the label for renewable diesel, but fuel retailers price renewable diesel at a discount to petroleum-based diesel because the label allows both parties to know exactly what they are buying and what they are selling. If the label is removed, those price discounts would go away. Are the price discounts that the labels provide considered a consumer benefit?

Fuel retailers can price renewable diesel at a discount to petroleum diesel because federal and state incentive programs allow them to offer it at that lower price. Those incentives – including the Renewable Fuel Standard’s tradable Renewable Identification Numbers (RINs), the Blenders Tax Credit, and state-level Low Carbon Fuel Standard credits – would continue to exist in the renewable diesel value chain absent any pump label. If retailers believe a label provides a benefit to their customers, however, nothing in S. 4038 would prohibit them from disclosing the percentage of renewable fuel they choose to purchase from suppliers, blend, or offer for sale.

Question 2: Does removing this label have the potential to play a part in or result in fuel prices rising?

No. On the contrary, removing the labeling requirements would benefit consumers by allowing renewable diesel to be moved through existing infrastructure from refineries to end users. This avoids the additional costs of duplicative pipelines and storage facilities as well as the cost of trucking renewable diesel to terminals for blending.



August 9, 2022

Senator Joseph Manchin III
Chair, Senate Committee on Energy and Natural Resources
HSOB-Hart Senate Office Building
Constitution Ave. and 2nd St. NE
Room 306
Washington, DC 20510-4004

US S 3543: Vehicle Innovation Act of 2022

Dear Honorable Manchin,

On behalf of the American Association for Laboratory Accreditation (A2LA), I write regarding US Senate Bill 3543 specifically as it pertains to technology testing and the development of standard testing procedures.

A2LA is a non-profit, accreditation body with over 4000 actively accredited organizations located in all 50 states as well as an international presence. We have been granting accreditation to automotive testing laboratories for over three decades and currently have over 500 laboratories accredited for automotive testing. The criteria forming the basis for our laboratory accreditation is ISO/IEC 17025 [General requirements for the competence of testing and calibration laboratories](#). We ourselves have been evaluated against rigorous standards in providing these accreditation services and are recognized internationally to ISO/IEC 17011 and are signatories to international mutual recognition arrangements such as the Asia Pacific Accreditation Cooperation (APAC).

As the Committee on Energy and Natural Resources deliberates on this bill, we have the following information and language for the committee to consider.

Accreditation and Vehicle Innovation Act

In keeping with the Vehicle Innovation Act, we understand the objective of developing standard testing procedures and technologies for evaluating the performance of advanced heavy vehicle technologies. At this time of advancing technologies and standards, we strongly recommend that you consider establishing an accreditation requirement which will provide assurances that testing be conducted by laboratories that are technically competent to perform the tests. Several government agencies have been relying on existing laboratory accreditation programs as laboratory approval mechanisms for decades. For example, A2LA has similar experiences supporting the federal government via the EPA and DOE Energy Star Program, EPA WaterSense, the FCC for telecommunications and the CPSC for children's products. These agencies rely on the international accreditation framework that uses internationally recognized accreditation bodies providing ISO/IEC 17025:2017 Accreditation as an integral part of qualifying testing laboratories. This approach may also assist in controlling the agencies' program costs.

Page 1 of 2

Testing and activities supported by testing are referenced many times throughout US S 3543 resulting in data being relied on heavily in different cases such as, determining the path to pursue in research, making decisions on materials, for quality control, and for consumer safety just to name a few examples. We are suggesting that the laboratories be required to undergo accreditation, as a means of assuring that technically competent testing laboratories are used.

Suggested language to use in the bill is recommended as follows in bold italics:

Sec. 7. Vehicle Research and Development, (3) Industry Participation (A) In general. – To the maximum extent practicable, activities under this Act shall be carried out in partnership or collaboration with automotive manufacturers, heavy commercial, vocational, and transit vehicle manufacturers, qualified plug-in electric vehicle manufacturers, compressed natural gas vehicle manufacturers, vehicle and engine equipment and component manufacturers, manufacturing equipment manufacturers, advanced vehicle service providers, fuel producers and energy suppliers, electric utilities, universities, national laboratories and independent, ***accredited research laboratories.***

How accreditation works

Laboratories must demonstrate their ability to conduct specific testing and show their technical competency during on-site assessments. This means demonstrating the entire process from preparation to conducting and reporting the test results. The accreditation body will evaluate the facilities and equipment that is used to ensure it is appropriate, well-maintained, and calibrated, as needed. Deficiencies cited during the assessment process must be addressed with corrective action prior to the accreditation being granted. Accreditation bodies grant a scope of accreditation that identifies the specific types of testing that the laboratory was found competent in performing.


Summary

By relying on internationally recognized accreditation agencies will be ensuring that the independent research laboratories have demonstrated:

- the ability to adapt to technical advancements in the industry and adopting new standards by showing method validations and related data
- technical competency to perform the specific tests, and
- are maintaining procedures for hiring and monitoring personnel for appropriate technical knowledge, skills, and experience relevant to the specific testing.

We would be pleased to elaborate on our comments or provide additional information. You are welcome to contact me directly at rquery@A2LA.org.

Sincerely,



Randall Query

Director of Government Relations

A2LA



Chet M. Thompson
President and CEO

American
Fuel & Petrochemical
Manufacturers

1800 M Street, NW
Suite 900 North
Washington, DC
20036

202.457.0480 office
202.844-5505 direct
202.457.0486 fax
Cthompson@afpm.org

August 11, 2022

The Honorable Joe Manchin III, Chairman
Senate Committee on Energy & Natural Resources
304 Dirksen Senate Building
Washington, DC 20510

The Honorable John Barrasso, M.D., Ranking Member
Senate Committee on Energy & Natural Resources
304 Dirksen Senate Building
Washington, DC 20510

Dear Chairman Manchin and Ranking Member Barrasso,

The American Fuel & Petrochemical Manufacturers (AFPM) writes in support of S.4038, the "*Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022*." This legislation will remove outdated and unnecessary barriers to greater production and use of renewable diesel and sustainable aviation fuel (SAF), which are both critical fuels for reducing carbon emissions from the transportation sector. We urge the Senate to pass this bipartisan legislation quickly.

AFPM is the leading trade association representing the makers of the fuels that keep us moving, the petrochemicals that are the essential building blocks for modern life, and the midstream companies that get our feedstocks and products where they need to go. AFPM members produce products that make life better, safer, and more sustainable. Our members strengthen economic and national security while supporting more than three million jobs nationwide. AFPM's members are also the leaders in both renewable diesel and SAF production, accounting for more than 80 percent of recently announced investments in new capacity.

Federal regulations generally require fuel dispensers to inform end-users about the renewable content of the fuel they are buying, and AFPM supports transparency and consumer choice in fuel technologies. However, under current law, the Federal Trade Commission (FTC) requires all renewable fuel blends with more than 20 percent renewable fuel by volume to specify the exact percentage of the renewable diesel content. Because renewable diesel meets all the same technical specifications as petroleum diesel and is chemically indistinguishable, meeting the FTC requirement is simply impractical for many market participants. For this reason, AFPM agrees with the California Air Resources Board that this labeling requirement is an impediment to greater production and use of renewable diesel. Removing the labeling requirement will provide more market flexibility and reduce artificial barriers to renewable diesel uptake, all without adverse impacts on consumers.

In addition to the labeling provisions, this bill also provides the added benefit of requiring the Department of Energy to track foreign imports and domestic production of renewable diesel and



sustainable aviation fuel and to incentivize more of these fuels to be produced in the United States.

This is a commonsense bill that is supportive of U.S. energy security, the environment, and consumers. AFPM supports the *Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022* and urges its swift passage by the U.S. Senate.

Sincerely,

A handwritten signature in black ink, appearing to read "Chet Thompson". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Chet Thompson
President and CEO
American Fuel & Petrochemical Manufacturers



April 26, 2022

The Honorable Joe Manchin
 Chairman
 Committee on Energy and Natural Resources
 U.S. Senate
 Washington, DC 20510

The Honorable John Barrasso
 Ranking Member
 Committee on Energy and Natural Resources
 U.S. Senate
 Washington, DC 20510

Re: Renewable Diesel Label and the Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022 (S. 4038)

Dear Chairman Manchin and Ranking Member Barrasso:

As associations representing the consumers and retailers of “Renewable Diesel”, we urge you to oppose efforts to eliminate fuel pump labeling requirements pertaining to Renewable Diesel.¹ Our membership supports aggressive policies that would increase production and consumption of lower carbon intensity fuels. This objective is best achieved by making these more environmentally attractive fuels less expensive for consumers than petroleum-based fuel. The fuel pump label for Renewable Diesel is essential to ensuring that Renewable Diesel is less expensive than petroleum-based diesel at retail. This has successfully driven consumer demand of cleaner fuels, which has in turn prompted increased investment in those technologies.²

The Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022 (S. 4038) includes a provision that would eliminate current Federal Trade Commission (FTC) fuel pump label labeling requirements pertaining to

¹ The American Trucking Associations (ATA) is the largest national trade association for the trucking industry. Through a federation of 50 affiliated state trucking associations and industry-related conferences and councils, ATA is the voice of the industry. America depends on most to move our nation’s freight. The California Fuels & Convenience Alliance (CFCA) is the industry’s statewide trade association representing the needs of independent wholesale and retail marketers of gasoline, diesel, lubricating oils and other petroleum products; transporters of those products; and retail convenience store operators. Currently, California has the largest market for Renewable Diesel and changes to the Renewable Diesel label would have an outsized impact on the state. The National Association of Convenience Stores (NACS) is an international trade association representing the convenience store industry with more than 2,200 retail and 1,600 supplier companies as members, the majority of whom are based in the United States. NATSO currently represents more than 4,000 travel plazas and truck stops nationwide, comprised of both national chains and small, independent locations. SIGMA represents a diverse membership of approximately 260 independent chain retailers and marketers of motor fuel.

² Renewable Diesel is the largest LCFS credit-generating category in California. Total gallons of Renewable Diesel in the state have increased by over 40 percent when comparing 2019 to 2021. See California Air Resources Board, 2021 LCFS Reporting Tool (LRT) Quarterly Data Summary Report No. 3 available at https://ww2.arb.ca.gov/sites/default/files/2022-02/Q3%202021%20Data%20Summary_013122.pdf.

Renewable Diesel. We therefore strongly oppose this legislation in its current form. If the problematic language eliminating the Renewable Diesel labeling requirement were removed, we would support the legislation, as it would drive additional research and development into lower carbon-intensity fuels.

The current FTC label provides the transparency that our member-companies need to improve and track the environmental footprint of the fuels that they buy and sell. This transparency ultimately lowers the price that customers pay for lower carbon intensity fuels relative to petroleum-based fuel.

Renewable Diesel is a much cleaner form of diesel fuel. But it is also much more expensive. There are **numerous state and federal incentives** designed to make Renewable Diesel cost-competitive with petroleum-based diesel. At present, these incentives all result in Renewable Diesel being sold at retail for less money than petroleum-based diesel. This is the desirable outcome in any alternative fuels incentive program – it drives additional investment and attracts consumers.

A number of oil refiners have recently begun converting oil refineries into Renewable Diesel plants. This is good for the environment, the market, and shows that the current policy is working.³

While these developments are positive, eliminating the Renewable Diesel label would undercut these gains. It would allow *Renewable Diesel* to be commingled in the transport and logistics system that moves *petroleum-based diesel*. This would ultimately lead to a situation where retailers and consumers are not fully aware whether they are purchasing *Renewable Diesel* or *petroleum-based diesel* – the price of the two would be the same, rather than Renewable Diesel having a cost advantage.

Meanwhile, all of the **numerous state and federal incentives** that are designed to make Renewable Diesel less expensive would be hidden from retailers and consumers. This would undercut the purpose for providing incentives for Renewable Diesel – that being able to make the product more attractive for everyone in the supply chain to make or purchase. Keeping the label in place is the best way to maximize the quantity of renewable diesel that is sold.

Eliminating the Renewable Diesel label at fuel pumps also would prevent trucking companies from quantifying their reduced carbon footprint that comes with buying Renewable Diesel vs. straight diesel fuel. This understanding is an increasingly essential component to these companies' environmental strategies, which often involves publicly disclosing climate information as it relates to risk reduction and greenhouse gas (GHG) reductions. In light of the recent Securities and Exchange Commission (SEC) proposed rule that requires certain companies to report climate-related risks, it is imperative that truck drivers have seamless access to information regarding the environmental characteristics of the fuel that they purchase. The Renewable Diesel label provides that information. Were it to be eliminated, it would be exceedingly complicated and expensive for retailers and trucking firms to ascertain the carbon footprint of their activities.

In almost any consumer product market, disclosure of the product being bought and sold is a foundational tenet of consumer protection and proper functioning of the market. In this case, such disclosure also is necessary

³ See recent announcements: BP Press Office. 2022. "BP Investing Almost \$270 Million To Improve Efficiency, Reduce Emissions and Grow Renewable Diesel Production At Cherry Point Refinery"; see also Global Clean Energy Holdings Inc., "ExxonMobil Helps GCEH Advance Renewable Diesel, Camelina Projects | BiodieselMagazine.com," www.biodieselmagazine.com, February 9, 2022.; see also Lane, Jim. 2022. "Neste Inks Renewable Diesel JV With Marathon, To Invest \$1B In US Production". Biofuels Digest; see also Janet McGurty. 2022. "Phillips 66 Starts Up First Renewable Diesel Unit At Rodeo Refinery". S&P Global; see also The American Fuel & Petrochemical Manufacturers, "Through Investment and Innovation, America's Fuel Refiners Are Decarbonizing Heavy Transportation." POLITICO, November 19, 2021; and see also Erin Voegelé, "Phillips 66 Ramps up Renewable Diesel Production | Biomassmagazine.com," biomassmagazine.com, June 11, 2021.

to ensure that low-carbon fuel incentives are achieving their intended purpose: Making lower carbon-intensity fuels less expensive for consumers than petroleum-based fuel. While we remain willing to work with all of you and the authors of S. 4038 on these issues, we strongly oppose any efforts to alter the existing labeling requirements for Renewable Diesel and urge you to oppose the bill unless the provisions pertaining to Renewable Diesel labeling are removed.

Sincerely,

American Trucking Associations
California Fuels & Convenience Alliance
National Association of Convenience Stores
NATSO, Representing America's Travel Centers and Truck Stops
SIGMA: America's Leading Fuel Marketers

cc: Members of the Committee on Energy and Natural Resources



Statement for the Record by the
AMERICAN PUBLIC POWER ASSOCIATION (APPA)
And the
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION (NRECA)
Submitted to the
SENATE ENERGY AND NATURAL RESOURCES COMMITTEE
In support of
S. 3719, the Southwestern Power Fund Establishment Act
July 28, 2022

The American Public Power Association (APPA) and National Rural Electric Cooperative Association (NRECA) appreciate the opportunity to submit a statement for the record for the Senate Energy & Natural Resources Committee's hearing to receive testimony on S. 3719, the Southwestern Power Fund Establishment Act. APPA and NRECA support the comments submitted by the Southwestern Power Resources Association. APPA and NRECA strongly support S. 3719, which would allow the Southwestern Power Administration (SWPA or Southwestern) to better plan for and respond to drought, avoid rate spikes, and support long-term capital investments in energy infrastructure. SWPA is one of four Power Marketing Administrations (PMAs) that market federally-generated hydropower to public power utilities and rural electric cooperatives at rates set to cover all the costs of generating and transmitting electricity. No costs are borne by taxpayers and this legislation would not change that.

The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. APPA represents public power before the federal government to protect the interests of the more than 49 million people that public power utilities serve, and the 96,000 people they employ. NRECA is the national service organization representing the interests of electric cooperatives and the member-consumers they serve. More than 900 not-for-profit rural electric utilities provide electricity to over 42 million people in 48 states, or one in eight electric customers nationwide.

Background

Hydropower Benefits

Making full use of the nation's hydropower resource is key to ensuring that the nation's grid remains reliable and resilient, and that utilities can meet emission reduction goals. Hydropower is a source of emissions-free, base-load power. Furthermore, hydroelectric generators can be started or stopped quickly, which makes them more responsive than most other energy sources for meeting demand for electricity at

its “peak” or highest volume. Hydropower’s “black start” capability makes it especially valuable in restoring power when there are widespread outages or disruptions on the system—this capability allows the generating units to cycle back on quickly if they have been tripped off in a power outage.

Federal Hydropower

The PMAs¹ provide millions of Americans served by not-for-profit public power and rural cooperative electric utilities with cost-based hydroelectric power produced at federal dams operated by the U.S. Army Corps of Engineers (Corps) and Bureau of Reclamation (Reclamation). Federal hydropower and the PMAs are critical, though often overlooked, elements of the nation’s power supply.

The Corps and Reclamation are the largest and second largest (respectively) generators of hydropower in the country. The PMAs market federally generated hydropower, with a statutory right of first refusal granted to not-for-profit entities, including public power utilities and rural electric cooperatives (called “preference customers”), at rates set to cover all the costs of generating and transmitting the electricity, as well as repayment, with interest, of the federal investment in these hydropower projects.

The PMAs annually review their rates to ensure full cost recovery. None of the costs are borne by taxpayers. Power rates also help to cover the costs of other activities authorized by these multipurpose projects such as navigation, flood control, water supply, environmental programs, and recreation.

S. 3719, the Southwestern Power Fund Establishment Act

APPA and NRECA strongly support S. 3719, the Southwestern Power Fund Establishment Act. The Southwestern Power Administration markets hydroelectric power produced at 24 Army Corps multipurpose dams to over 100 public power and rural electric cooperatives in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas that provide power to over 10 million end-use customers.

While customers pay all PMA costs through their power rates, as mentioned above, for the Southwestern Power Administration, Western Area Power Administration, and the Southeastern Power Administration, those monies flow back to the U.S. Treasury and then must be appropriated by Congress.² In addition, the PMAs must receive yearly funding levels from Congress for purchasing and wheeling (transmitting) power in a drought situation or when the water at the dams is used for purposes other than for electricity production (i.e., recreation and environmental mitigation). This money for “purchase power and wheeling” will then be paid for by the PMA customers through their rates.

Unfortunately, the current funding process for SWPA has increasingly failed to provide the financial certainty necessary to ensure steady power rates to customers during drought and other extreme weather events. When purchase power and wheeling funds (which, again, are always fully paid back by customers) are not appropriated in sufficient amounts or in a timely manner, SWPA is forced to use emergency funding mechanisms that require same year cost recovery, which cause rate spikes. These rate spikes cause unnecessary economic hardship for communities served by public power utilities and rural electric cooperatives.

S. 3719 would move SWPA to a “revolving fund” model where receipts from power sales would be deposited into a permanent mandatory Treasury revolving fund and retained across fiscal years to fund future expenses as necessary. Future annual discretionary appropriations would no longer be needed. This change will provide SWPA and its not-for-profit customers funding certainty for purchase power and

¹ The four PMAs are: the Bonneville Power Administration (BPA), Western Area Power Administration (WAPA), Southwestern Area Power Administration (SWPA) and Southeastern Power Administration (SEPA).

² The Bonneville Power Administration’s governing statute was amended in the 1980s to establish a “revolving fund” model so that ratepayer money goes directly to Bonneville rather than to the Treasury.

wheeling and other costs. This is a proven model of success for federal utility programs with business-like functions.

It must be noted that while Congressional Budget Office rules will result in a “score” for the new SWPA Fund, there is no taxpayer burden – public power utilities and rural electric cooperative customers will continue to repay 100 percent of all costs associated with the generation and transmission of hydropower produced at Corps dams. Moreover, each PMA (and the region it serves) is different and while a revolving fund is necessary and appropriate for SWPA and its customers, it may not be for other PMAs.

Conclusion

Public power utilities and rural electric cooperatives in Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas are proud of their long and successful partnership with the SWPA and the Army Corps. S. 3719 will allow this partnership to continue for decades to come by giving SWPA and its customers the financial tools to avoid rate spikes while continuing to invest in infrastructure.



Sen. Joe Manchin, Chairman
 Sen. John Barrasso, Ranking Member
 Senate Committee on Energy and Natural Resources
 304 Dirksen Senate Office Building
 Washington, DC 20510

July 27, 2022

Dear Chairman Manchin and Ranking Member Barrasso,

Clean Fuels Alliance America is the U.S. trade association representing the entire biodiesel, renewable diesel, and sustainable aviation fuel supply chain, including producers, feedstock suppliers and fuel distributors. Our industry supports 65,000 U.S. workers and generates \$17 billion in economic opportunity nationwide.

We welcome proposals that will improve transparency in regulatory requirements and help to increase production and use of biodiesel, renewable diesel, and sustainable aviation fuel. However, we oppose provisions of the Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022 (S.4038) that will create an uneven playing field in the market for biodiesel and renewable diesel.

Currently, biodiesel and renewable diesel are treated identically in Federal Trade Commission labeling and disclosure requirements, under 2008 amendments to the agency's Automotive Fuel Ratings, Certification, and Posting regulations. S.4308 directs the FTC to exempt renewable diesel – and only renewable diesel – from these requirements. There is no justification for eliminating the labeling requirement for one fuel while leaving it in place for the other.

While renewable diesel meets and often exceeds the same ASTM 975 standard as petroleum diesel, there are some differences between the two fuels; for example, renewable diesel has a significantly higher cetane value than petroleum diesel. These differences can lead to different expectations and vehicle performance variations that not every OEM fully approves. Current labeling requirements for renewable diesel therefore provide consumers important information about the product and its expected performance in engines. Our members do not agree with the California Air Resources Board's claim that renewable diesel faces unique or disproportionate impacts under the FTC labeling regulations.

Labels convey crucial information to fuel providers, their customers (such as trucking fleets), and downstream consumers about the environmental footprint of the fuels. Essential consumer goods and service providers (such as retail and supermarket chains) need data about the renewable content of fuels to properly measure Scope 3 GHG emissions. This

Missouri Headquarters
 605 Clark Ave
 PO Box 104898
 Jefferson City, MO 65110

800.841.5849

Washington, D.C., Office
 1331 Pennsylvania Ave, NW
 Suite 505
 Washington, DC 20004

888.246.3437

California Office
 1415 L Street
 Suite 460
 Sacramento, CA 95814

916.760.8870

Massachusetts Office
 36 Jonspin Road
 Suite 235
 Wilmington, MA 01887

978.267.3020

cleanfuels.org

information would be less transparent if renewable diesel producers alone are exempted from providing it via the FTC labeling requirement.

The labeling regulations present the exact same market opportunities and challenges for both biodiesel and renewable diesel. For example, in California, the market for renewable diesel has increased rapidly in the past decade, growing from less than 2 million gallons in 2011 to nearly 1 billion in 2021. The state's biodiesel market has grown more slowly, reaching 292 million gallons in 2021.

Continued growth for both fuels will rely on parity in regulations. The labeling requirement should be equivalent for both fuels, whether eliminated, modified or maintained. A change to regulatory standards for one fuel could create a competitive disadvantage for the other.

We encourage the committee to avoid creating a potential market imbalance with the proposed provisions of the Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2022 (S.4038).

Thank you for your consideration,

A handwritten signature in black ink that reads "Kurt A. Kovarik". The signature is written in a cursive, slightly slanted style.

Kurt Kovarik
Vice President of Federal Affairs
Clean Fuels Alliance America
kkovarik@cleanfuels.org
202-737-8801

**Written Testimony for the Record
In support of S. 3769 Weatherization Assistance Improvements Act of 2022
Senate Committee on Energy & Natural Resources
Full Committee Hearing on July 28, 2022**

**David Bradley, Chief Executive Officer
National Community Action Foundation**

Thank you for this opportunity to enthusiastically support S. 3769 – the Weatherization Improvements Act of 2022 – on behalf of the local Weatherization Assistance Program (WAP) providers known as Community Action Agencies (CAAs). We are very grateful to its sponsors, and we would like to thank Senators Chris Coons and Susan Collins, along with Senators Jack Reed and Jeanne Shaheen, the authors of this important bill, for their continued leadership on the Weatherization Assistance Program. Chairman Manchin’s consistent support of the program along with that of Ranking Member Murkowski have been a foundation for its steady growth and development.

The National Community Action Foundation represents local Community Action Agencies which work in nearly every county in the United States. More than 550 of our member organizations make up over 80% of the Department of Energy WAP subgrantees; that means they are responsible for recruiting and qualifying participants, for hiring, training, and sending teams to evaluate the homes and install the most cost-effective efficiency measures and for arranging for third-party inspections when the work is done.

The venerable Weatherization Assistance Program is a proven success, as confirmed by multiple evaluations; it was partly updated by the reauthorization bill which originated in this Committee as far back as 2016 and became law in late 2020. Rapid changes in residential HVAC technology options, in the domestic fuel mix, and in construction labor markets mean the program now needs additional changes to loosen its red tape and free it of a few obsolete standards that are relics of its origin decades ago. At present, the program solves a 20th century problem – wasteful usage of fossil fuels and electricity in homes – by making investments that safely reduce the use of those same fuels by about 20 percent, improve indoor air quality and provide basic safety improvements.

The WAP is about to begin deploying the resources of the Infrastructure Investment and Jobs Act, of which about \$3.1 billion will go to the state programs. S. 3769 makes the statutory changes needed to allow our local teams to make best use of this welcome opportunity; with these changes, they can use 21st century tools and technologies to retrofit homes so those homes can withstand the 21st century’s extreme weather threats to lower-income communities and individuals. It addresses statutory stumbling blocks to an appropriate program, and we urge its enactment as soon as possible.

The four essential changes addressed in this legislation are:

1. Investing more per home on average

The statutory state average cost per unit (ACPU) spending limit is set at a more reasonable \$12,000, about 50% above the current ceiling of \$8,007 (the statute's cap of \$6,000 adjusted since enactment for annual CPI). It is essential for several reasons:

- **Market Conditions:** This change will allow our teams to acquire building materials and equipment that have skyrocketed in price since the pre-pandemic years and to pay competitive wages to the workforce. Most of the workers installing WAP measures are local contractors and their employees, so CAAs are competing with private sector developers to provide attractive jobs.
- **Labor and Job Training Goals:** In preparation for the program expansion over the next five years, our network has identified workforce issues as the greatest challenge to success. CAAs' share the goal of the IJJA – attracting and training labor from the disadvantaged communities they serve and offering good jobs with a future. Today, once new workers have completed the rigorous WAP training, which costs thousands per recruit, they are soon lured to the private sector construction industry with its more reasonable pay. Because of the IJJA resources, as well as the energy markets, there is plenty of competition for these trainees.
- **Today, most local programs pay wages so low that both WAP installers and their supervisors could be eligible for the program themselves if they were not employed by it.** Weatherization can only retain the workforce it will need if agencies can pay family-supporting wages; under the more reasonable ACPU cap in this bill this better pay is more likely.
- **Further, unless this bill is enacted, our teams will be required to install far fewer measures in apartments to pay the good wages required by statute.** In most states, the current ACPU constraints keep wages below the market wages reported for each state by the Department of Labor for comparable jobs.
- **Resiliency Measures:** The new ACPU ceiling may also allow our teams to include materials and climate- resilience measures, including electrification, renewable energy and structural improvements where cost-effective.
- **Energy Justice:** The proposed changes also undergird WAP's energy justice purpose. The most vulnerable people with the highest energy burden are typically those in the most dilapidated, inefficient homes. These houses need more work and major equipment replacements than others. To maintain a lower average cost, WAP teams that have retrofitted a dilapidated house today must seek out homes that need very few improvements so that the lower cost of weatherizing those better-off units offsets the work in the most climate-vulnerable homes. This is a source of extreme frustration to local CAA teams who would prefer to focus all help on the people and places with the

deepest disadvantages. Also, the most wasteful buildings are those that will realize the greatest savings from WAP upgrades. The change will allow more of the most economically disadvantaged households to participate in the program.

S. 3769 gives the Department discretion to increase this ceiling should future conditions warrant. We believe this provision, which is not included in the House companion bill H.R. 7947, is necessary, and we hope this Committee will insist on its inclusion. The one certainty is change; future policy, technology, and workforce conditions together will disrupt the market for and prices for traditional efficiency services and products. Construction materials and labor are famously variable in price. We believe the Department must have the authority to calibrate the program if appropriate.

2. Fixing the eligible homes

The Bill authorizes the “Weatherization Readiness” fund for making major repairs that make homes structurally sound and safe enough for the installation of efficiency and renewable energy measures. This fund is not currently authorized, but the FY2022 Appropriations include \$15 million to initiate such work and the FY2023 budget request doubles that figure.

However, the more substantial and predictable fund for this purpose as contained in S. 3769 is an urgent need. WAP measures must be cost effective as measured by the predicted avoided cost of future fuel bills. This is a reasonable discipline (though it requires some regulatory updates). However, retrofit measures, including insulation or efficient equipment, cannot be installed in buildings that leak, that have dangerous wiring or unsound structural elements. The residences with those defects are almost exclusively occupied by lowest-income energy consumers.

- According to a Federal Reserve Bank of Philadelphia study, millions of homes need major repairs. Over the past few years, CAAs have deferred tens of thousands of eligible homes for lack of funds to make them Weatherization-ready. We conducted and learned that in some rural areas, as many as half the eligible homes inspected were in “deferral” condition.
- During the period of performance of IJIA, more than 200,000 homes may be weatherized. In line with the Infrastructure Act Energy Justice priorities, which our members heartily endorse, CAAs will there need more work and major equipment replacements. However, to maintain the current low average cost, WAP teams will have to seek out homes that need very few improvements so that the lower cost of weatherizing those better-off units offsets the work in the most climate-vulnerable homes. This is a source of extreme frustration to local teams who would prefer to focus all help on the people and places with the deepest disadvantages. Weatherizing the homes in the poorest condition also has the greatest impact on reducing consumption and GHG emissions because those are the least efficient units. The change will allow more of the most disadvantaged households to participate in the program.
- Further, by DOE policy, the appropriated ‘Readiness’ funds are restricted to the units

served by the “regular” formula program. With this fund authorized and funded at a substantial level, our local teams can prepare the most dilapidated homes for the WAP services they need regardless of the account that funds them.

3. Normalizing renewable technology

For many reasons, it will remain challenging to offer access to renewable energy to eligible, low-income homeowners, including landlords, in the CAAs’ communities. However, the decades-old restrictions in WAP rules would keep the WAP program resources entirely out of the renewable transformation “toolbox.” This program can make a major contribution to giving lower-income communities more access to renewables if it can partner with utilities and the emerging industry in state, utility, and local programs. The current statutory constraints are an unreasonable barrier to getting the benefits of renewable energy into low-income communities. S. 3769 changes sections 6865 (c) of the current statute by raising the allowable cost cap on any renewable energy system from \$3,000 to \$6,000. While this change is intended to allow WAP to install solar systems where appropriate and cost effective, unfortunately, we believe it will not achieve its objective.

- Solar systems are the only measure or process in the program subject to a cost cap.
- Current law has meant that local agencies do not include solar measures in their WAP package of services; when and where they can obtain other funding, they must ensure no DOE funds were used to select, transport, install or inspect that equipment or work, lest the cost restriction be applied. Our focus groups with local agencies indicate that the most desirable use of renewable systems is on the many multi-family buildings that are home to most eligible households. The proposed cost limit appears to reflect a valuation of some single-family home systems, but it continues to exclude not only many of those installations, but more cost-effective multi-family systems as well.
- This statutory provision was inserted nearly two decades ago when solar technology was in its infancy. The cost effectiveness modeling systems used to evaluate all technologies selected for WAP installations can apply to renewable systems as well. In fact, a pilot program in Colorado demonstrated an energy audit that worked with WAP.

The local agencies want us to urge the Committee to treat renewable energy as one more HVAC option that is evaluated as all WAP investments are. That would mean eliminating sections (c) 4 and 5, as is the case in the House companion bill.

4. Clarifying the “re-Weatherization” restriction

S. 3769 corrects a long-standing “red-tape” issue. USC Section 6865 (c) 2, 42 reads “Dwelling units weatherized (including dwelling units partially weatherized) under this part, or **under other Federal programs** (in this paragraph referred to as “previous weatherization”), ...” [emphasis ours]

As interpreted by the Department of Energy, this section of current law means CAAs need to find files from any federal program delivered by any state or local or non-profit grantee or contractor that might have worked on improving that building in the past. The CAA would either need to demonstrate that there was no service in the past 15 years or, in the few cases where work might have been installed, ascertain that whatever work was done was not an energy conservation measure. CAAs only have records for LIHEAP-funded and DOE funded work.

- The task is not only impossible, but it is also unnecessary. Weatherization teams perform thorough inspections before determining what investments, if any, will be installed. A home that has been weatherized in the past will not qualify as needing a WAP job.
- Eliminating the requirement simply ends the delay and paperwork burden of waiting on other federal, state, and local programs to comb through their past records to verify the negative – i.e., to verify that no comparable services were provided.

In sum, this is a terrific piece of legislation. Enactment is going to smooth the path to delivering high impact, 21st century measures and to achieving the goals of the expanded program over the coming years. We applaud the sponsors and the Committee for your leadership in moving so expeditiously to bring the Weatherization Assistance Program into the present.



August 11, 2022

The Honorable Joe Manchin
Chairman
Energy and Natural Resources Committee
United States Senate
304 Dirksen Senate Building
Washington, DC 20510

The Honorable John Barrasso
Ranking Member
Energy and Natural Resources Committee
United States Senate
304 Dirksen Senate Building
Washington, DC 20510

Re: Support for the *Renewable Diesel and Sustainable Aviation Fuel Parity Act of 2002* (S. 4038)

Dear Chairman Manchin and Ranking Member Barrasso,

The Western States Petroleum Association (WSPA) and the Oregon Fuels Association (OFA) are pleased to support increased production and use of renewable diesel and sustainable aviation fuel. We support provisions in S. 4038 that enable barrier removal regarding labeling requirements and requests the definition of SAF and RD are expanded to include all feedstocks and processing methods. Thank you for hosting a July 28, 2022 committee hearing on the matter.

WSPA is a non-profit trade association that represents companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas, and other energy supplies in California and four other western states, and has been an active participant in air quality planning issues for over 30 years. Some WSPA members are currently pursuing modifications of California refineries to produce a substantial volume of renewable diesel once operational. These facilities will play a key role in transitioning to lower carbon intensity transportation fuels. WSPA members form the backbone of California's economy, providing jobs, fueling air, road, and marine transport, and supplying necessary energy to the manufacturing and agriculture sectors.

OFA is the voice of Oregon's locally-owned fuel stations, fuel distributors and heating oil providers. OFA members are at the forefront of environmental stewardship within the industry as the leading suppliers of biodiesel and other low carbon fuels. Often multi-generational, family-owned businesses, members fuel Oregon's economy by providing career opportunities to thousands of employees across the state. The association is a leading advocate for common sense regulations that balance affordable fuels and environmental stewardship.

In general, we support this bipartisan legislation that will remove unnecessary barriers towards greater production and use of renewable diesel and sustainable aviation fuels. However, we support technology neutrality and, therefore, believes that all sustainable aviation fuels and renewable diesel products should have the same consideration, regardless of feedstocks or processing methods. We request the definitions of SAF and RD be expanded to include the use of all feedstocks. In addition, we encourage a practical approach to gaining GHG reductions from SAF, which is limited by the requirement for SAF to meet a 50% lifecycle GHG reduction threshold. This arbitrary threshold eliminates portions of the market that achieve important GHG reduction, slowing overall progress towards climate goals.

Outdated labeling requirements is an impediment for fuel station operators to provide higher levels of renewable diesel. Because existing Federal Trade Commission rules generally require fuel dispensers to inform end-users about the exact renewable content of the fuel they are buying – through labeling requirements requiring renewable fuel blends with over 20% renewable fuel by volume specify the

exact concentration – it is simply impractical for many market participants to determine such specification since renewable diesel meets all of the same technical specifications (ASTM D975) as petroleum diesel. Furthermore, it limits the widespread distribution of the lower carbon fuel on common carrier pipeline system due to these same labeling requirements.

Removing the labeling requirement and expanding definitions of SAF and RD will provide numerous economic and health benefits. It will offer more market flexibility, enhance widespread deployment, reduce artificial consumer barriers to renewable diesel uptake, and help further reduce carbon emissions from the transportation sector.

WSPA and OFA support S. 4038 to encourage greater domestic energy production and security, help the environment, and benefit consumers. Thank you for the time and consideration of our comments.