



2021 NUCLEAR ENGINEERING STUDENT DELEGATION

WASHINGTON, D.C. SEPTEMBER 26TH - OCTOBER 1ST

The Delegation supports the continued funding of and investment in the future of the nuclear workforce through:

- The bipartisan National Nuclear University Research Infrastructure Reinvestment Act of 2021 (H.R. 4819) to revitalize and create new university nuclear science facilities,
- Appropriations for scholarship programs as specified by the Energy Act of 2020 to provide scholarships and research opportunities to students pursuing degrees related to nuclear energy.

The Delegation supports prompt actions to achieve clean energy production and a strong nuclear infrastructure through:

- The bipartisan Infrastructure Investment and Jobs Act (H.R. 3684 Sec. 40323) and the bipartisan Zero-Emission Nuclear Power Production Credit Act of 2021 (H.R. 4024) which preserves the existing nuclear fleet and ensures domestic energy security,
- The Nuclear Industrial Base Act (H.R. 1698) and the American Nuclear Infrastructure Act (S. 2373) which ensure an effectively integrated nuclear supply chain.

The Delegation supports the continued funding and modernized licensing of advanced reactor development through:

- Sustained appropriations for the Versatile Test Reactor (VTR) to provide domestic testing capabilities for advanced reactor technologies,
- Sustained appropriations for the Advanced Reactor Demonstration Program (ARDP) to accelerate the commercialization of advanced designs,
- The bipartisan American Nuclear Infrastructure Act (S. 2373 Title II) and Advanced Nuclear Deployment Act (H.R. 1746) to create a licensing framework for advanced reactor designs.

The Delegation supports action towards a permanent disposal facility for used nuclear fuel through:

- Amendments to the Nuclear Waste Policy Act to remove Yucca Mountain as the only option for a permanent repository, the creation of a sole-purpose organization, and incorporating informed consent-based siting procedures,
- Allowing for one or more private or public pilot consolidated interim storage facilities, as proposed for appropriations by Sect. 308(b) of S.2605.

2021 Nuclear Engineering Student Delegation

Evan Gonzalez (Chair)	University of Michigan
Brent Hollrah (Co-Vice Chair)	Texas A&M University
Peter Hotvedt (Co-Vice Chair)	University of Michigan
Amanda Bachmann	University of Illinois, Urbana-Champaign
Peter Brain	Rensselaer Polytechnic Institute
Kaylee Cunningham	University of Florida
Robyn Hutchins	Kansas State University
Zachariah Jones	Texas A&M University
Miriam Kreher	Massachusetts Institute of Technology
Guillaume L'her	Colorado School of Mines
Pearle Lipinski	Ohio State University
Madeline Lockhart	North Carolina State University
Kathryn Mummah	University of Wisconsin, Madison
Malachi Nelson	University of California, Berkeley
Bobbi Riedel	University of New Mexico, Albuquerque
Laura Shi	University of California, Berkeley
Sarah Stevenson	University of California, Berkeley

About the NESD

In 1994, the first Nuclear Engineering Student Delegation (NESD) convened in Washington, D.C. to reinstate funding for research reactors. Today, the Delegation continues to express the views of students on nuclear science, policy, and education issues. Each year, the Delegation comprises a diverse group of students from the nation's most prestigious nuclear engineering programs, representing various disciplines within the nuclear sciences.

For further information on the 2021 NESD or the policy recommendations in this document, please contact Evan Gonzalez at esgonz@umich.edu or visit the NESD website at <http://www.nesd.org>.

2021 NESD Policy Statement

Continued Investment in Nuclear Education

The sustainment of current American nuclear infrastructure is essential to maintaining energy independence, national security, and economic prosperity. Nuclear power currently provides 52% of U.S. clean energy, but the industry is threatened by a decrease in human capital as a result of an aging workforce and fleet.¹ In today's nuclear workforce, 38% of employees are eligible to retire; we must fill these roles with a new generation of nuclear professionals to bridge the generational workforce gap.² Meeting future workforce demands will require increased investment in education.

The Delegation supports the passage of the **National Nuclear University Research Infrastructure Reinvestment Act of 2021 (H.R. 4819)** which provides educational and training opportunities to the incoming nuclear workforce. The Delegation supports the future appropriation of funds for nuclear programs outlined in the Energy Act of 2020, which provides further support to programs such as the Nuclear Energy University Program and establishes new workforce pipelines, such as the Nuclear Energy Graduate Traineeship Subprogram.³ The Delegation urges policymakers to continue support for these programs and to commit to appropriating the authorized funds in future fiscal years.

Preserving the Existing Nuclear Fleet and Fostering New Reactor Construction

New reactor construction is paramount for supporting energy grid resiliency and clean energy efforts. However, there are currently significant economic and regulatory hurdles to constructing new reactors. The **American Nuclear Infrastructure Act (S.2373, Title III-IV)** reestablishes the global leadership of the United States in nuclear energy, and bolsters supply chain infrastructure.

Problems with sourcing nuclear-grade materials and a lack of skilled labor have caused delayed construction time tables and increased costs; the nuclear energy supply chain needs to be strengthened. The **Nuclear Industrial Base Act (H.R. 1698)** requires the Department of Energy to monitor and assess the needs of the industry and support public-private partnerships to deploy new nuclear power. Supply chain analysis is necessary for increasing the competitiveness of nuclear energy technology by highlighting and addressing vulnerabilities and urgent operational needs.

One of the challenges for the operating nuclear fleet is tax credit inequities. The production tax credit is currently only eligible during the first eight years of reactor operation. The Delegation supports the bipartisan **Zero-Emission Nuclear Power Production Credit Act of 2021 (H.R. 4024)** to establish a tax credit for existing nuclear plant operators, akin to the credit presently available to wind operators.⁴ The bipartisan **Infrastructure Investment and Jobs Act (H.R. 3684 Sec. 40323)** complements H.R. 4024 to establish a financial credit program for economically challenged nuclear power plants.

American Nuclear Leadership and Advanced Reactor Technologies

The U.S. has long pioneered advanced nuclear reactor technologies that improve upon the efficiency, reliability, and inherent safety of the existing fleet. The global market for these reactors is projected to

¹ "5 Fast Facts about Nuclear Energy." 2021. *Energy.gov*. <https://www.energy.gov/ne/articles/5-fast-facts-about-nuclear-energy> (September 26, 2021).

² Faison, Jay. 2020. "A Battle for Nuclear Jobs." *ClearPath*. <https://clearpath.org/our-take/a-battle-for-nuclear-jobs/> (September 26, 2021).

³ Energy Act of 2020 (Consolidated Appropriations Act of 2021, Pub. L. No. 116-260 § Div. Z (codified in scattered sections of 42 U.S.C.)).

⁴ "Legislation Introduced to Extend Production Tax Credits to Nuclear -- ANS / Nuclear Newswire." <https://www.ans.org/news/article-3022/legislation-introduced-to-extend-production-tax-credits-to-nuclear/> (September 26, 2021).

grow by \$740 billion by 2030.⁵ While U.S. companies were once the leading international supplier of reactors, state owned corporations from the Russian Federation and the People’s Republic of China now fill this role and will for decades to come.⁶ Not only is this disengagement a lost economic opportunity, but it also threatens the U.S.’s status as a global leader in shaping nonproliferation, safety, and security policy.

Domestic advanced reactor companies are limited by an outdated regulatory scheme. Accordingly, the [Nuclear Energy Innovation and Modernization Act of 2019](#) took crucial steps to provide the NRC with financial resources and a mandate to develop an advanced reactor licensing framework by 2027. This goal is met by the [Advanced Nuclear Deployment Act \(H.R. 1746\)](#) and the [American Nuclear Infrastructure Act of 2021 \(S. 2373, Title I-II\)](#). These bills should be passed to provide specific guidelines needed to ensure the U.S. nuclear industry remains competitive and influential.

Bringing advanced nuclear designs from concepts to commercialization requires extensive research and funding associated with building a first-of-a-kind reactor. Many advanced reactor types require specialized testing capabilities and the enrichment of High-Assay Low-Enriched Uranium (HALEU) fuels, both of which are currently only available in the Russian Federation. The Versatile Test Reactor (VTR) will bring advanced testing capabilities to the U.S., yet the 2022 FY budget does not include funding for the VTR. Without proper funding, the U.S. will continue to be dependent on the Russian Federation for advanced nuclear technology testing and fuels. We must reinstate VTR funding and create domestic HALEU infrastructure to ensure the U.S. becomes independent in nuclear development.

Advanced reactor developers must demonstrate to investors and utilities that their designs are economical and safe. Yet without investor funding, they lack the resources to exemplify this. The Advanced Reactor Demonstration Program (ARDP) provides funding for the most promising advanced reactor companies to demonstrate their technologies, reducing the risk to investors considering their design. Continued congressional appropriations to the ARDP are critical to the production of operable advanced reactor designs by 2028.

Breaking the Used Nuclear Fuel Stalemate

A permanent disposal facility for used nuclear fuel (UNF) is a vital component of the nuclear fuel cycle, and has been in a political stalemate. To move forward on the creation of a UNF repository, the Delegation supports further amendment to the Nuclear Waste Policy Act. Such amendments should remove Yucca Mountain as the only location where site-specific activities can occur, allow for the creation of a single-purpose organization devoted to the storage and disposal of UNF and high-level waste, as originally proposed in the Blue Ribbon Commission on America’s Nuclear Future,⁷ incorporating informed consent-based siting into the procedure to research, design, and select a repository. The Delegation also supports allowing for one or more private or public pilot consolidated interim storage facilities as proposed for appropriations by Sect. 308(b) of the [Energy and Water Development and Related Agencies Appropriations Act, 2022 \(S.2605\)](#).

⁵ Nuclear Energy Leadership Act, S. 903, 116th Cong. § 8(a)(2) (2020).

⁶ Bowen, Matt, “Why the United States Should Remain Engaged on Nuclear Power: Geopolitical and National Security Considerations.” Columbia Center on Global Energy Policy, https://www.energypolicy.columbia.edu/sites/default/files/file-uploads/Nuclear_Geopolitics_CGEP_Commentary_FINAL.pdf.

⁷ Hamilton, Lee H., and Scowcroft, Brent. 2012. “Blue Ribbon Commission.” https://www.energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf.