DECARBONIZING OUR ECONOMY:

Nuclear Energy Policy Priorities

NUCLEAR ENERGY INSTITUTE

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DECARBONIZING OUR ECONOMY: NUCLEAR ENERGY POLICY PRIORITIES

Nuclear energy is the ideal carbon-free, 24/7/365 partner to wind turbines, solar panels and energy storage in meeting President Biden's goal to decarbonize our electricity system by 2035 and rebuild the economy.

1. Ensure continued operations of existing reactors

Federal, state and market-level actions are urgently required to address structural market issues in order to better value nuclear energy's carbon-free attribute in electricity markets. Without action, additional nuclear plants will be unnecessarily shuttered in the near-term and the challenge to achieve carbon neutrality will only become greater. The most cost-effective step that can be taken towards achieving carbon reduction goals is to preserve these carbon-free energy workhorses.

2. Accelerate demonstration and commercialization of new technologies

New nuclear generation will be needed to achieve meaningful carbon reductions in the electric, transportation and industrial energy sectors. Government support in the form of both R&D funding and incentive policies is needed to accelerate and expand the deployment of advanced reactor technologies in order to meet the diverse set of market and customer needs.

3. Promote increased nuclear exports

With nearly 30 countries working to develop new nuclear programs and many others looking to expand their existing programs, the largest markets for new nuclear power plants are outside the U.S. Exporting nuclear plants overseas provides tremendous benefits to U.S. job creation and balance of trade; a recent report from UxC estimates U.S. exports of civil nuclear technology could total $1.3 to $1.9 trillion through 2050. Due to the strategic and highly regulated nature of civil nuclear exports, government must work alongside industry to help U.S. firms compete against their state-owned rivals.

4. Take bold action to fulfill the government's responsibility on nuclear waste

This long-standing impasse must be resolved if nuclear energy is to achieve its full potential as part of an increasingly clean U.S. energy system. We stand ready to work with Congress and the Administration to get the nuclear waste program back on track.

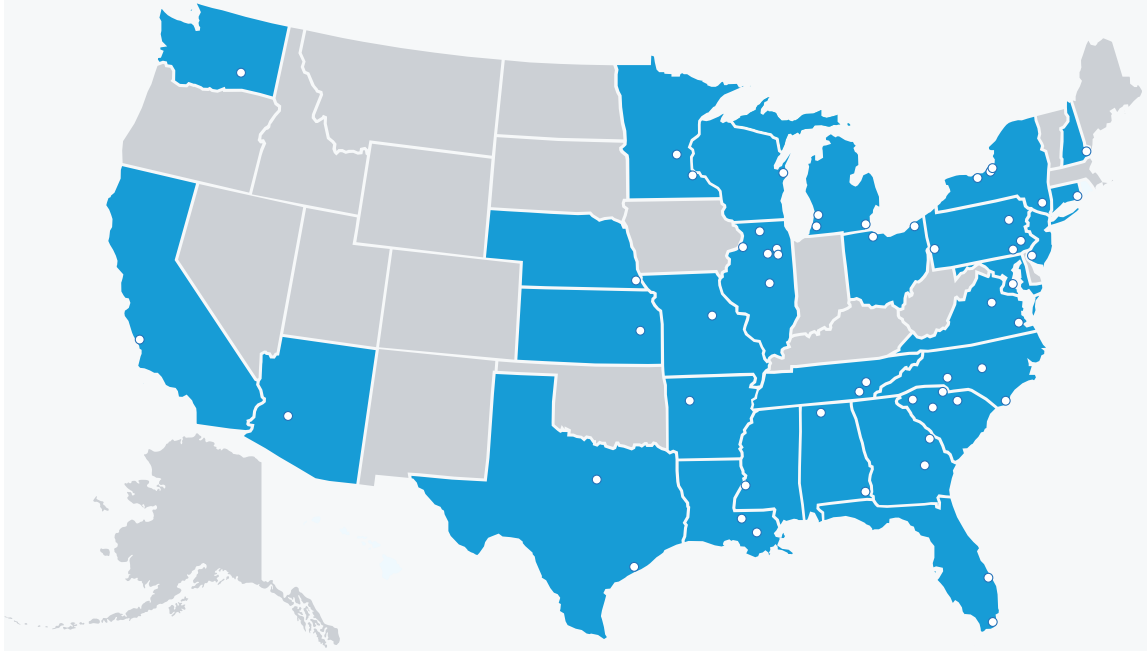
DECARBONIZING OUR ECONOMY

As part of his plan to solve climate change and rebuild the economy, President Biden has pledged to **"leverage the carbon-pollution free energy provided by existing sources like nuclear"** and make "**far-reaching investments**" in **"critical clean energy technologies"** including "**advanced nuclear**."

This focus on nuclear power makes sense.
The 94 nuclear power reactors operating across the country produce about 20 percent of the United States' electricity. These reactors are the largest source of carbon-free electricity in the U.S. by far, generating more than half the nation's supply. The reactors also produce power around the clock, for up to 24 months between refueling. These attributes make nuclear power reactors the ideal carbon-free, 24/7/365 partner to wind turbines, solar panels and energy storage in meeting the President's goal to decarbonize our electricity system by 2035. And it's why utilities that have committed to decarbonize are working to preserve their existing nuclear generation and are investigating new nuclear technologies.

U.S. NUCLEAR PLANTS

All **55 power plants** avoid more carbon emissions annually than the CO2 emissions produced by **100 million passenger vehicles**.



Nearly
20% of the nation's electricity is generated by **94 reactors** in **28 states.**

Over
50% of our nation's **carbon-free electricity** is generated by nuclear power.

Nuclear plants operate
24/7/365

DECARBONIZING OUR ECONOMY

States and communities are also working to keep their nuclear power plants and spur new construction, because they know the economic and environmental benefits of nuclear energy. The nuclear energy sector directly employs approximately 100,000 workers in well-paying jobs, and is the highest paying industry in the electric power generation sector. All told, the nuclear energy industry is responsible for nearly half a million direct, indirect and induced jobs across the U.S. economy. Average nuclear industry wages are 36 percent higher than prevailing local wages. Yet economic pressures from historically low natural gas prices and incentives favoring other electricity technologies have contributed to the premature closure of eleven U.S. nuclear power plants. Absent additional action at the federal and/or state levels, this problem will only get worse in the coming years with another eight reactors currently slated to prematurely close within the next four years, and many more at risk.

In addition to preserving our existing nuclear power plants, more American workers should be designing and building more nuclear power plants, both here and abroad. And because nuclear energy is a strategic industry, forming 100-year relationships with our partner nations, competing and winning in the global marketplace isn't just a commercial victory—it is also a victory for U.S. standards for nuclear safety, nonproliferation and security. Yet while the U.S. brought the world into the nuclear age and our companies dominated nuclear trade for decades, today the Chinese and the Russians dominate the global nuclear marketplace. For the past decade or more, Russia and China have pursued long-term strategies to develop a robust domestic nuclear program and export nuclear technology. Nearly two-thirds of all nuclear power plants under construction use Chinese or Russian designs, strengthening their influence in Africa, Eastern Europe, Asia, and the Middle East. Unfortunately, the U.S. has not viewed the nuclear industry strategically and has not responded effectively to the threat posed by Chinese and Russian efforts to exert greater control over global energy markets through nuclear exports.

Action is required on several fronts to ensure that the existing U.S. nuclear fleet is sustained, that more plants are built at home, and that U.S. companies can compete aggressively against Russia and China and win more nuclear power plant contracts overseas. The actions outlined will enable the U.S. to retain its high-paying nuclear power jobs while developing new technologies that will support further job creation:

1. **Ensure continued operations of existing reactors**
2. **Accelerate demonstration and commercialization of new technologies**
3. **Promote increased nuclear exports**
4. **Take bold action to fulfill the government's responsibility on nuclear waste**

1. ENSURE CONTINUED OPERATIONS OF EXISTING REACTORS

Federal, state and market-level actions are urgently required to address structural market issues in order to better value nuclear energy's carbon-free attribute in electricity markets. Without action, additional nuclear plants will be unnecessarily shuttered in the near-term and the challenge to achieve carbon neutrality will only become greater. The most cost-effective step that can be taken towards achieving carbon reduction goals is to preserve these carbon-free energy workhorses. These actions should be implemented without delay to stop the closures of nuclear plants scheduled to take place in the next year. Once these plants close, they cannot reopen and their carbon-free contribution will be permanently lost.

Clean Energy

The Biden administration has made the transition to a carbon-free electricity system a high priority. Legislation to incentivize the deployment of new, clean technologies must also value the carbon-free generation from America's operating nuclear plants. Administration proposals to address our infrastructure should include provisions to preserve the well-paying, often rural, jobs at nuclear power plants potentially facing early closure.

National Priority

The administration should issue a statement of administration position on the importance of retaining nuclear power plants in conjunction with its announcement of the U.S.'s updated nationally determined contribution.

Electric Market Reform

The Federal Energy Regulatory Commission (FERC) should ensure that states maintain autonomy to create clean energy incentive programs. The president should nominate FERC Commissioners who are committed to respecting state decisions on electricity supply and integrating state and regional carbon pricing proposals into organized market rules.

Legislation

The administration should work with Congress to develop incentives for companies that continue to safely operate and maintain nuclear plants, particularly those plants that are at risk of premature closure due to economic stresses, until enactment of a federal clean energy standard or other policy that fully values nuclear energy for its carbon-free attribute. These could include investment tax credits and increasing the maximum duration of power purchase agreements from 10 years to 30 years.

Regulatory

The Biden administration should also ensure that the U.S. Nuclear Regulatory Commission (NRC) continues its effort, started under the Obama administration, to transform its regulatory approaches to keep pace with new technologies and operating practices. Efficiency of regulations, including streamlining the environmental reviews in recognition of nuclear environmental benefits, are important to ensure this carbon-free technology is viable.

2. ACCELERATE DEMONSTRATION AND COMMERCIALIZATION OF NEW TECHNOLOGIES

New nuclear generation will be needed to achieve meaningful carbon reductions in the electric, transportation and industrial energy sectors. Government support is needed to accelerate and expand the demonstration of advanced reactor technologies in order to meet the diverse set of market and customer needs.

U.S. Department of Energy Office of Nuclear Energy Budget

In keeping with the Biden administration's plan to significantly increase clean energy technology investments, the budget request for the Office of Nuclear Energy (DOE-NE) must increase from about $2 billion in fiscal 2022 to about $3 billion in fiscal 2026. This will enable completion of important programs discussed below, along with the needed investments in research and development infrastructure that will help ensure America's innovators are able to deliver world-leading technologies to market.

Advanced Reactor Demonstrations

It is essential for the government to fully-fund the existing public-private partnerships to demonstrate new technologies under the Advanced Reactor Demonstration Program and the Advanced Small Modular Reactor Program.

Fuel Availability

Ensuring the availability of uranium and advanced nuclear fuels will help improve the economics of today's reactors and support the next generation. DOE must provide an interim supply of high-assay low-enriched uranium (HALEU), support the creation of a domestic HALEU production to meet both commercial and government needs, and complete the public-private programs to develop advanced technology fuels.

Federal Energy Procurements

As set forth in the executive order on "Tackling the Climate Crisis at Home and Abroad," the Biden administration should use tools such as federal power purchase agreements to support both existing nuclear power plants and the construction of next-generation reactors and should seek authority to extend such agreements to 30 years.

National Security

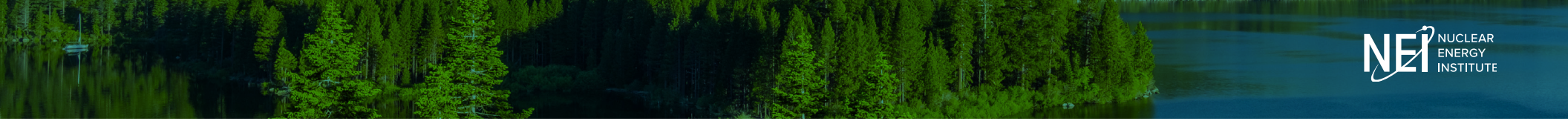
Nuclear technology is uniquely positioned to strengthen U.S. national security by powering installations and remote locations and to power space exploration. The administration should fully fund the micro-nuclear reactor demonstration at the Department of Defense Strategic Capabilities Office (DoD/SCO).

Legislation

To ensure deployment extends beyond initial demonstrations, the administration should work with Congress to enact market-stimulating policies for the full range of carbon-free energy resources. In the case of nuclear energy, the existing (but limited) Nuclear Production Tax Credit (PTC) should be increased to $27/MWh, and should be made more flexible by allowing for refundability and creating an option to convert to an Investment Tax Credit. The per-reactor cap should be removed and the national program cap should be raised to 25,000 MW. In addition, nuclear energy should be included in the tax provisions for master limited partnerships.

Fossil Fuel Replacements

The construction and operation of new nuclear reactors will require much of the same skilled workforce and infrastructure that exists at shut down coal and gas plants. Consistent with the Biden administration's plans for empowering workers through revitalizing energy communities, the administration should work with Congress to establish a special incentive for advanced reactor construction in coal communities and other areas impacted by the transition from fossil fuel.



3. PROMOTE INCREASED NUCLEAR EXPORTS

With nearly 30 countries working to develop new nuclear programs and many others looking to expand their existing programs, the largest markets for new nuclear power plants are outside the U.S. Building nuclear plants overseas provides tremendous benefits to U.S. job creation and balance of trade; a recent report from UxC estimates U.S. exports of civil nuclear technology could total $1.3 to $1.9 trillion through 2050. Due to the strategic and highly regulated nature of civil nuclear exports, government must work alongside industry to help U.S. firms compete against their state-owned rivals. However, U.S. policies to promote nuclear exports lag behind competitors such as those of Russia and China, thereby placing U.S. companies at a competitive disadvantage. To enable U.S. firms to compete and win in the global market, the Biden administration should urgently pursue policies that would:

Ensure Federal Coordination

Nuclear cooperation and subsequent commercial projects are often the product of government-to-government engagement at the highest levels. Federal efforts in close coordination with industry are critical to our collective success. Restoration of a nuclear energy policy director within the Executive Office of the President is an important step in ensuring coordination and focus on nuclear energy.

Boost Advocacy

With the significant role of government-to-government engagement in nuclear commerce, it is critical that nuclear cooperation be part of the strategic engagement between the U.S. and our partners. Elevating nuclear engagement and advocacy in bilateral dialogues through intergovernmental agreements will be essential.

Enhance Export Financing

Financing is critical to U.S. nuclear competitiveness abroad. Continuing to employ the Export-Import Bank, the U.S. International Development Finance Corporation and the U.S. Trade and Development Agency as key enablers of U.S. nuclear energy exports and working to modify policies and expand the support available through these agencies to enhance competitiveness will be necessary.

Embrace Nuclear Energy as Clean Energy

As the world pursues clean and sustainable energy, it is critical that nuclear energy has access to the same resources as other clean energy technologies. To that end, it is vital that the Biden administration works to ensure that nuclear energy is included in the development of international and multi-national standards for clean energy development. Specific examples include the European Union‘s taxonomy and clean energy finance initiatives under the United Nations.

Enable Market Access

Unlike most other exports, nuclear energy exports require an intergovernmental framework agreement for nuclear cooperation. With the expansion of global markets, it is imperative that the State Department and other agencies have the resources to coordinate closely with the industry to ensure needed agreements are in place in anticipation of need.

Improve Export Control Efficiency

It will be imperative to improve the speed and predictability of DOE’s export control licensing process by expanding general and fast-track authorizations for low-risk activities, and by implementing bilateral mechanisms in key markets to facilitate export authorization.

4. TAKE BOLD ACTION TO FULFILL THE GOVERNMENT'S RESPONSIBILITY ON NUCLEAR WASTE

In 1987, Congress amended the Nuclear Waste Policy Act and identified the Yucca Mountain site as the only site to be characterized for suitability to host a repository for spent nuclear fuel and other high-level radioactive wastes. Following an extensive evaluation of the site, in 2008 DOE submitted a license application to the NRC to construct a repository at Yucca Mountain. In 2010, DOE sought to withdraw the application, and it has now been more than a decade since Congress last appropriated funds to continue the Yucca Mountain licensing process. In the meantime, funds collected from nuclear energy generators to pay for the construction and operation of a repository have sat unused in the Nuclear Waste Fund, with a balance now exceeding $45 billion.

This long-standing impasse must be resolved if nuclear energy is to achieve its full potential as part of an increasingly clean U.S. energy system. We stand ready to work with Congress and the Biden administration to get the nuclear waste program back on track.

Administration Action

While Congress considers the future of the Nuclear Waste Policy Act, the Biden administration should take steps to stand up an organization to resume management of the nuclear waste program. The administration should seek Congressional authorization and funding to begin implementation of an integrated nuclear waste management system that allows for private consolidated interim spent fuel storage approaches.