



NUCLEAR ENERGY INSTITUTE

## **Nuclear Power in America and the World**

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### *Memorandum for the Trump Transition Team*

Economic, reliable, stable electricity is the lifeblood of our economy, a critical ingredient of prosperity for companies big and small, and for many cities and rural areas. A key part of that system is nuclear electricity, which is fundamental to energy independence, national security and assuring that American industry will retain global technological leadership in the manufacture and export of energy technology.

Good-paying jobs depend on meeting the needs of households, shops and factories with sensible electricity policies. And we will not have abundant, clean, affordable electricity without nuclear power plants, which provide their benefits for the better part of a century.

But for nuclear power to contribute its maximum benefit to the economy and the environment – including reliable production with no air pollution, stability for the electric grid and high-tech jobs – the industry needs adjustments in some federal policies. At the moment, it is facing historically low natural gas prices, low demand for electricity, and state and federal policies that favor other non-emitting technologies. Together, these factors have sometimes cut wholesale prices below the reactors' costs of operation.

Both the industry and the nation need to be forward-thinking, pushing ahead with long-term strategies to support American technological advancements. New reactor designs can meet needs that will press upon us in coming decades. They can mesh well with intermittent renewables, and provide heat for applications in other sectors of the economy making us independent of imported fuels or fuel price fluctuations.

But construction of advanced reactors is unlikely if the nation does not sustain the fleet of reactors we have now. Today's reactors are enjoying remarkable success in operations – they run smoothly at virtually full capacity for more than a year at a stretch, while enhancing the health of people and the environment. We have built up valuable expertise in how to operate these fleets of high-tech machines that turn out copious amounts of clean energy. Allowing them to shut prematurely represents poor, short-sighted decision-making, and results in immediate, severe economic impacts for local areas.

The energy sector has always been heavily shaped by government policy. Several key policies are needed in the immediate future and in the longer term to ensure the benefits of nuclear power for the long-term:

## **Plant Preservation**

**Federal Energy Regulatory Commission (FERC):** Existing reactors must be recognized for all the benefits they bring to the electric system, through the following changes:

- The Federal Energy Regulatory Commission should clarify that its requirement for “just and reasonable” rates that are not “unduly discriminatory or preferential” implies compensation for all of these benefits: high reliability and availability, increased grid resiliency due to operability under all weather conditions and no need for continuous fuel supply, and virtually zero emissions.
- FERC should work with the Independent System Operators and Regional Transmission Organizations to ensure that the competitive markets fully value all the attributes of existing nuclear plants, and the services they provide to the grid.
- FERC should address flaws in the structure of the markets it governs. Among these, the system makes “uplift” payments to generators that are not economic but are needed to assure reliability, but the cost of those payments does not enter into the price paid to other producers, including reactors.
- The agency should make clear that generation sources that by their nature tend to stabilize electricity prices and limit the risks from fuel price volatility should be compensated for protecting consumers by improving the diversity of the system.

**U.S. Department of Energy (DOE):** The Department of Energy should use its authority and meet its legal responsibilities to take the steps needed for the industry, including:

- Moving to preserve reactors that are threatened with closure because their compensation is now limited to wholesale electricity sales and small payments for capacity. Preservation of the existing fleet is important not only for meeting clean air standards, grid reliability, providing price stability and maintaining jobs, but also because future nuclear deployment will need the technical and licensing knowledge gained through decades of operations, and availability of an experienced nuclear workforce.
- Supporting technical initiatives to improve the operation of the current fleet, including work on accident-tolerant fuel and on aging management.

**Presidential Action:** As a principle of good governance, government at all levels should specify goals, not means. For example:

- The previous administration’s Executive Order 13693, a clean air strategy which requires the federal government to buy more renewable energy, should be rewritten by the White House to allow nuclear energy to participate. State renewable portfolio standards should become clean power standards.

- State-level strategies to promote clean air through renewables should get a nudge from the White House to explore methods like New York's Clean Energy Standard to support existing reactors that are threatened, or Connecticut's proposal, still under consideration, for a long-term power purchase agreement, and FERC should support these strategies.

## Used Fuel Management

**U.S. Department of Energy (DOE):** The Department of Energy should honor the contracts it signed in the early 1980s to take delivery of used nuclear fuel.

- Completing the licensing process for Yucca Mountain as a permanent repository for used fuel, as called for under the Nuclear Waste Policy Act of 1982, and working with volunteer sites (there are at least two) to establish an interim storage location. These steps would allow re-use of former reactor sites where used fuel is now stranded, and cut the government's cost in legal judgments, already in the billions of dollars, for failing to meet its contractual obligations. A new organization, more businesslike in its approach, should be established and given access to the Nuclear Waste Fund, money paid in by the industry and its customers to solve this problem, and now sitting idle.

**U.S. Nuclear Regulatory Commission (NRC):** Ensure an efficient and predictable licensing process for an Away-From-Reactor consolidated interim storage facility, in a location with a willing host.

- Supporting the demonstration of storage of high-burnup fuel, a fuel technique that improves reactor productivity and limits the volume of material requiring disposal.

## Regulation

**Legislative and Executive:** The Nuclear Regulatory Commission and the Federal Energy Regulatory Commission should be put on a more businesslike footing.

- Congress and the White House should take concerted action to assure that qualified experts are nominated and confirmed in a timely manner to the Nuclear Regulatory Commission and the Federal Energy Regulatory Commission, to ensure high-caliber leadership. Congress should amend the law so that NRC members serve until a successor is nominated and confirmed, to reduce the chronic problem of vacancies that can threaten continuity of operations.
- The NRC should promptly assure that it has a regulatory framework that provides for effective and efficient regulatory review and approval of 20-year license renewals for plants requesting approval to operate beyond 60 years.

- The NRC should approve a risk-informed decommissioning rule, improving regulatory efficiency, so that plants being dismantled do not have to seek one-time, step-by-step permission for what has become a routine procedure.
- The NRC's regulatory processes are, understandably, centered on light water reactors. These processes must be updated to enable NRC to efficiently and effectively review advanced non-light water reactors. These regulations should provide a cost-effective, predictable licensing process, including an optional staged regulatory approval with milestones that match investment decision points; and standards that are performance-based and risk-informed.
- The NRC should also develop the expertise it will need for the highly specialized work of certifying the designs of reactors that rely on new technologies. The regulatory approval process should not become a stumbling block to the rollout of new technologies.

## Competitive Export Policy

**Executive Branch:** The White House, Departments of Energy, State and Commerce and other key federal agencies should explicitly recognize that civilian nuclear energy exports are a critical component of U.S. foreign policy, critical to nuclear safety, non-proliferation and global environmental goals. The exports support economic and job growth at home, and are crucial to meeting nuclear safety and security and nonproliferation objectives globally. U.S. nuclear exporters compete against state-owned enterprises for a share of the global market. Specifically:

- The administration should support the global competitiveness of the U.S. nuclear sector by implementing a unified approach by the pertinent Executive Branch agencies, with leadership at the National Security Council, and in close coordination with U.S. industry.
- The administration must
  - streamline the export licensing process (a major barrier to U.S. competitiveness) by improving the efficiency, predictability, transparency and speed of DOE's 810 export control licensing process, and remove Light Water Reactors from the covered technology list
  - conclude Agreements for Peaceful Nuclear Cooperation under Section 123 of the Atomic Energy Act, and renew those agreements on a timely basis, with key potential markets and strategic allies
  - assure continued availability of export credit financing
  - pursue workable international nuclear liability arrangements; and
  - remove obstacles to the effective financing of large infrastructure projects through Ex-Im Bank, other agencies like the U.S. Trade and Development Agency and the Overseas Private Investment Corporation, and encourage lending for clean nuclear energy projects from multilateral and regional development banks.

## **New Reactor Development and Deployment**

**Legislative and Executive:** Congress and the White House should work together to allow the nation to take full advantage of the experience gained in construction of the four advanced light-water reactors now nearing completion. For example:

- New construction will need improved, durable financing models. With expanded loan guarantees and tax benefits and the formation of project development companies that have been used successfully in other countries, and the detailed blueprints now available, combined with an experienced cadre of specialized craft workers and regulators and an established supply chain, the industry could begin stamping out a series of standard reactors that would operate through most of this century.
- Loan guarantees should be offered, with a negotiated process to develop credit subsidy cost, based on project-specific recovery analysis.
- Small modular reactors and new large designs would represent a major component of our future infrastructure, but Congress and the White House should work together to increase funding for developing them. The Energy Department and the industry should develop an agreement on the scope of a research, development and deployment portfolio, and priorities for funding, which should be adequate to the work at hand. Pursuing multiple approaches will increase the certainty of timely development of useful new models, cutting the national risk of technical failure. And the successful outcome will demonstrate American technological and manufacturing leadership.
- Congress and the White House should substantially expand support for research, development and deployment of advanced non-light water reactors. The light-water reactors in service have served us well, but reactors using coolants other than water (e.g., molten sodium, lead, salt, or helium gas) hold great promise for more affordable energy that can be used in making electricity, chemicals, fresh water and vehicle fuels, all of which will be needed for coping with the shifting patterns of rainfall and temperature that have been observed in the last few decades. Although the concept of human-caused climate change is contentious, the data are clear that the climate is changing, and smart government policy would be to move to protect the economy and human comfort in this circumstance. DOE's Gateway for Accelerated Innovation in Nuclear (GAIN) should be supported.

### **U.S. Nuclear Regulatory Commission (NRC):**

- The Nuclear Regulatory Commission should develop a stable, predictable licensing platform for new plants, and re-examine the licensing process used for the Vogtle and Summer projects, the first under 10 CFR 52, to find lessons for increased efficiency. With more construction experience and a gradual expansion of the supply chain, the industry will be better positioned to meet the needs of the 2020s and 2030s, domestically and internationally, using an advanced passive light water reactor that will be put in service in the next few years.

- The NRC should offer a licensing path better suited to start-up companies with new technologies, because the heavy burden of government regulation should not stifle American technological innovation. An optional staged regulatory approval process with meaningful regulatory milestones that match investment decision points should be developed. Regulation should be risk-informed, performance-based and technology-inclusive.
- The commission should develop the expertise to regulate advanced non-light water reactors with which it does not now have experience. And the government should assure that the cost of such regulation does not become a barrier for the entrepreneurs who are seeking to launch a new industry.
- The White House should promote the use of power-purchase agreements by federal agencies to support new nuclear technologies, including small modular reactors and advanced reactors. Launching these reactors will enhance America's strategic trade position, and national security.

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