

Executive Order XXXXX

Expanding Nuclear Energy Capabilities to Improve Climate, National, and Energy Security

The United States and the world have a profound opportunity to address three interwoven challenges: mitigating the impacts of climate change, expanding access to clean and reliable energy production, and countering the coercive energy policies of authoritarian regimes. All three have the potential to reduce the threat to human safety, increase reliable power delivery, and enhance our national security as well as that of our allies.

Geopolitical strife continues to disrupt global energy supplies. In February 2022, the Russian Federation illegally and brutally invaded the sovereign nation of Ukraine. This egregious act of war, in addition to creating untold levels of human suffering, has had significant detrimental impacts on global agriculture, commerce, and energy supply chains, including for nuclear energy. In the international arena, the Russian Federation uses its state-owned nuclear industry as a geopolitical cudgel, locking other nations into long-term relationships. In addition, the People's Republic of China has been promoting nuclear generation as part of its Belt and Road Initiative, a growing economic ploy to trap countries in a debt financing commitment to China. According to the International Energy Agency, since 2017, Russian and Chinese reactor designs have accounted for 87-percent of newly installed nuclear reactors worldwide, and China is on a path to become the world's leading nuclear-power producer before 2030.

It is essential that the United States strategically develop, maintain, and utilize our domestic energy resources while also enabling global access to American energy technologies. America must lead the world, in partnership with our allies and economic partners, to safeguard the environment, enhance global security, and increase prosperity for all. This is particularly important as America embarks on a new era where advances in artificial intelligence and a rapidly expanding data center industry bring great value to our nation but place significant demands on our electrical grid.

Nuclear energy plays a critical role in addressing these challenges. As announced at the World Climate Action Summit of the 28th Conference of the Parties to the U.N. Framework Convention on Climate Change (COP28), the United States, along with more than twenty like-minded nations from four continents, announced a goal of tripling nuclear energy production by the year 2050.

The United States will lead this effort through positive example. Through the actions listed herein, America will take bold steps to triple domestic nuclear energy capacity by 2050, as well

as serve as the world's key supplier for the needed global expansion of this invaluable energy source.

By the authority vested in me as President by the Constitution and the laws of the United States of America, and building on the provisions of Executive Order 14008, it is hereby ordered:

SECTION I. Purpose. The purpose of this Executive Order is to take important and necessary steps to build upon existing bipartisan efforts to expand the American nuclear energy sector, in order to meet our growing domestic energy needs, to support our international commitments, including our vital pledge to triple domestic and global nuclear energy capacity, to provide the worldwide marketplace with American technology and innovation, and to fully establish and promote America's leadership role in the global nuclear energy industry.

Nuclear energy is essential to United States national security, energy security, and environmental sustainability. Both current and advanced nuclear energy technologies dramatically reduce carbon emissions, offer the benefits of safe and reliable power, can be employed to decarbonize a wide array of thermally intense industrial processes, can augment capabilities for space, undersea, and remote operations, and play a key role in our national defense architecture.

This order emphasizes action and deployment activities that are often multi-year in nature. My administration will coordinate these initiatives to enhance our nuclear energy sector, including securing the domestic nuclear fuel supply chain, supporting existing reactors, demonstrating advanced reactors, helping new reactors enter the marketplace, maintaining world-class research and development capabilities, securing the national security innovation base, supporting expanded nuclear trade and export programs, leveraging federal and commercial funding mechanisms, and developing the workforce of the future to support an expanded nuclear energy sector. We will achieve these goals while maintaining world-leading environmental safeguards and nuclear nonproliferation standards.

SECTION II. Policy.

It is the policy of the United States to:

- (a) Through firm and positive actions, triple domestic nuclear energy capacity by 2050, and serve as the world's leading supplier of advanced nuclear technologies;
- (b) Decarbonize electricity production and industrial processes by promoting nuclear technologies for a wide variety of uses, including electricity generation, thermal energy storage, hydrogen production, desalination, refining, and for other high-temperature process heat applications;
- (c) Support the continued operation of and appropriate operational life extensions for the current nuclear fleet;
- (d) Support expansion of the domestic nuclear fuel industry, including mining, conversion, enrichment, deconversion, and fuel fabrication, consistent with the highest standards of safety and environmental protection;

- (e) Facilitate the development, demonstration, and deployment of advanced reactor technologies, including small modular reactors, micro-reactors, and research and test reactors;
- (f) In conducting demonstrations or deployment of advanced nuclear technologies, employ fair, transparent, and open competitive selection processes, per standing federal acquisition regulations;
- (g) Provide support to nuclear reactor developers beyond initial demonstration of new technologies, to reduce the costs and risks associated with early deployment;
- (h) Employ advanced nuclear technologies in support of our national security objectives, including enhancing energy security for power-critical military facilities and missions, defense critical assets, and supporting infrastructure globally where possible;
- (i) Catalyze the use of advanced nuclear reactors to power the burgeoning information technology industry, to enable continued rapid growth of data center and artificial intelligence capacity;
- (j) Leverage gains from national security-related nuclear technology demonstrations to further advance the domestic civil nuclear industry, consistent with the safeguarding of militarily sensitive technologies;
- (k) Identify, evaluate and propose applications for the use of transportable nuclear energy generation for emergency and disaster response and recovery operations;
- (l) Pursue the use of nuclear energy and nuclear propulsion technologies for civil and national security-related space, maritime, undersea, remote, and non-traditional missions;
- (m) Employ the financial power of the United States government to reduce risk and to incentivize private capital investment to further these goals;
- (n) Ensure the United States maintains world leadership in nuclear energy research, development, and testing capacity and infrastructure among our national laboratories and research institutions, to curtail the use of Russian or other non-allied research and test facilities;
- (o) Expand nuclear workforce training programs in pace with the expansion of the domestic nuclear industry;
- (p) Promote the use of American nuclear energy technologies in overseas markets, in particular to compete with and displace the coercive energy policies of Russia and China; and

- (q) Improve coordination between the United States and our allies in the research, development, deployment, and secure exchange and export of nuclear technologies.

In achieving these goals, the United States shall lead globally in nuclear safety, security, regulation, and nonproliferation; actively support leading-edge research and development with supporting laboratory and university infrastructure; and ensure the health of a robust domestic nuclear technology industry, including all elements of the nuclear supply chain and workforce.

For all actions directed in this order where additional funding is required, and to minimize budgetary impact, previously-appropriated but yet-obligated funds shall be employed, to the maximum extent possible. The designated government official for each program listed herein shall seek required funding at the earliest possible juncture, through reprogramming requests to employ existing funds, or through the standing appropriations and authorization processes.

To be clear: an expansion of federal investment into nuclear power is essential if we are to meet our goal of tripling nuclear energy capacity in America by 2050, and in supporting a similar goal globally.

SECTION III. Supporting the existing nuclear fleet.

The American nuclear fleet of light water reactors provides roughly 20-percent of electricity and 50-percent of carbon-free energy to the nation, while supporting nearly 500,000 clean-energy jobs. A variety of policies and regional market dynamics have led to the premature closure of 13 nuclear power plants since 2012, and other operating plants are currently in danger of premature shut-down. Such shutdowns increase reliance on carbon-based energy sources.

To preserve the vital operating fleet and to ensure the availability of this nuclear power generation for the duration of each operating reactor's service life, the following actions shall be taken:

- (a) The Secretary of Energy, within 180 days of the date of this order, shall provide me a plan to maximize use of the Civil Nuclear Credit Program (CNC), which was authorized and funded in the bipartisan Infrastructure Investment and Jobs Act of 2021 to prevent the premature closure of operating nuclear plants and ensure the long-term operations of existing nuclear facilities. Much of this fund has been obligated or transferred to new programs, and the Secretary shall assess in the plan any need for additional funding for the CNC.
- (b) The Secretary of Energy and the Secretary of Treasury, within 180 days of the date of this order, shall conduct a study, in concert with the nuclear industry and the National Economic Council, to assess if recently enacted investment and production tax incentives are adequate for supporting the nuclear fleet; and, as appropriate, the Secretaries shall recommend a legislative solution to broaden existing tax incentives.
- (c) The Secretary of Energy shall expand current research and development programs associated with advanced fuels for the existing light water reactor fleet, in order to help bring more fuel-efficient technologies to market by the end of this decade. The Secretary shall work closely with

industry and the Nuclear Regulatory Commission to identify and facilitate the testing and analysis required to enable the rapid licensing of these improved fuel technologies.

(d) The Secretary of Energy, in collaboration with the nuclear industry and the Nuclear Regulatory Commission, shall advance efforts to support life extensions and power uprates for existing light water reactors, consistent with established standards of safety and security.

SECTION IV. The nuclear fuel supply chain.

Beginning in the 1940s, the United States created a robust nuclear fuel supply chain, which became the foundation for a thriving commercial nuclear industry in America and abroad. For decades, the United States led the world in uranium mining, processing, conversion, enrichment, and fuel fabrication, and was the premier supplier of nuclear fuel to the free world.

Over time this supply chain atrophied as other nations entered the market, in particular Russia, which possesses the largest uranium enrichment capacity in the world. Today, over a fifth of enriched uranium used in our nation's light water reactor fleet comes from Russia, which also is the only commercial source of the High Assay, Low Enriched Uranium (HALEU) that is needed to fuel a number of advanced reactor designs being developed for both civilian and military applications, as well as for essential nonproliferation programs.

To restore western leadership, the United States has committed, along with the United Kingdom, Canada, Japan, and France, to mobilize at least \$4.2 billion in government-led investments to expand our collective uranium enrichment and conversion capacity by 2026, which will catalyze further private sector investment in a safe, secure, and reliable nuclear fuel supply chain. The recent appropriation of \$2.72 billion for nuclear fuel programs in the Consolidated Appropriations Act of 2024 constitutes a major step forward and is the U.S. contribution to this commitment. Further, recent legislation banned the importation of Russian-produced enriched uranium, with waivers only where national needs would otherwise not be met.

To restore American leadership in all aspects of the nuclear fuel cycle, the following actions shall be taken:

(a) The Secretary of Energy shall provide a report to me within 90 days of the date of this order with options, recommendations, and resource needs to further expand the domestic Uranium Reserve authorized in the Energy Act of 2020.

(b) The Assistant to the President for National Security Affairs, working with the Director of the Office of Management and Budget, the Secretary of Energy, and the Secretary of Defense, shall provide me options and estimated costs for expanding the Uranium Reserve to include material that has been mined, converted, and enriched in the United States, using technology that is suitable for use in national security programs. This assessment shall be completed within 180 days of the date of this order.

(c) To accelerate the deployment of enrichment and deconversion capacity for HALEU, the Secretary of Energy shall expedite the existing HALEU Availability program, as authorized by

the Energy Act of 2020 and funded by the Inflation Reduction Act of 2022, the Consolidated Appropriations Act of 2024, and annual appropriations.

- (i) Through the HALEU Availability program, the Secretary shall provide guaranteed purchase agreements to catalyze private industry to deploy new domestic HALEU enrichment and deconversion capacity, capable of producing no less than 10 metric tons per year of 19.75% enriched HALEU by the end of calendar year 2030 and 20 metric tons of 19.75% enriched HALEU per year by the end of calendar year 2032. The HALEU enrichment capacity shall be accompanied by deconversion capacity that can convert the material to oxide and metallic forms. HALEU fuel purchased by the Department of Energy and provided to industry shall be priced, as needed, below actual production costs, in order to support early advanced reactor deployments.
 - (ii) Further, in the period before new HALEU enrichment and deconversion capacity is brought online, the Secretary shall use all available resources and methods, including the downblending of existing uranium stocks, to support government and industry HALEU needs.
- (d) The Secretary of Energy shall establish a new research and development program no later than one year from the date of this order, to explore improvements to *in situ* uranium mining technologies, including advanced water treatment technology. This program shall be focused on reducing costs while improving environmental and worker protections. Coincident with the establishment of this program, and in concert with energy justice initiatives, the Secretary shall submit a report to me outlining plans for bolstering domestic mining technologies, streamlining regulations and land access for uranium extraction, and identifying necessary funding and policy changes required to support this initiative.
- (e) Building off current efforts, the Secretary of Energy shall establish a new cost-shared, competitively-bid program to develop a fully-domestic uranium enrichment technology that is cost-competitive with others in the world market and can be used for national security programs. All design, supply chain, and manufacturing for this technology shall be U.S.-sourced. This program shall seek to advance a world-leading enrichment technology to Technology Readiness Level 6 by 2029, and have that technology ready for commercial deployment as soon as possible afterward. The government-owned enrichment technology being developed under the Department of Energy's Domestic Uranium Enrichment Centrifuge Experiment (DUECE) program shall be made available to industry, following applicable security regulations, as part of this competitive program. The Secretary shall establish this program within one year of the date of this order.
- (f) The Secretary of Energy shall establish a new cost-shared, competitively-bid program, modeled on the Advanced Reactor Demonstration Program, to support fabrication capacity for two or more advanced fuel forms, with new capacity online no later than 2030. The Secretary shall establish this program within 180 days of the date of this order.
- (g) The Secretary of Energy and the Secretary of Defense shall within 90 days of the date of this order submit recommendations to me on the availability of surplus Highly Enriched Uranium

that, if needed, could be used for downblending to HALEU, to support existing and future advanced reactor demonstration programs. The Secretary of Energy shall post an unclassified version of these findings on the Department of Energy web site within 180 days of the date of this order.

(h) The Secretary of Commerce, the Secretary of Energy, the Secretary of State, and the heads of other agencies, as appropriate, shall explore means and support needed by American nuclear fuel manufacturers to replace Russia as a supplier of fuel for the fleet of Russian-made VVER reactors currently deployed or being built in eastern Europe and other locales outside of Russia. The Secretaries shall provide to me within 90 days of the date of this order a plan to provide this support to industry.

(i) The Secretary of Commerce, the Secretary of Energy, and the Secretary of State shall identify actions needed to support the U.S. nuclear fuel industry in the international marketplace, in particular for providing Low Enriched Uranium and HALEU to the market to supplant supplies from Russia and China. The Secretaries shall provide to me within 90 days of the date of this order a plan to provide this support to industry.

(j) The Secretary of Energy, within 180 days of the date of this order, shall establish a new program to support expansion of domestic capacity for producing Low Enriched Uranium, as funded through the Consolidated Appropriations Act of 2024. The Secretary shall place this new program on an accelerated timeline, and shall take steps to assure that government support does not negatively distort the existing commercial LEU marketplace.

(k) The Secretary of Energy, within one year of the date of this order, shall update the Department of Energy's excess uranium management policy to align with the policy objectives of this order.

(l) In accordance with authorities provided in Section 2001 of the Energy Act of 2020, the Secretary of Energy shall conduct a program to develop methods and technologies to transport advanced nuclear fuels, and advanced reactors containing such fuels, in a safe and environmentally sound manner. The Secretary shall provide to me within 180 days of the date of this order an action plan for advanced fuel transportation and any additional legislative authorities required to support this initiative.

(m) The Secretary of Energy, in consultation with the Secretary of Commerce and the Secretary of Defense, shall provide me with a plan within 90 days of the date of this order on the use of the Defense Production Act to accelerate domestic production of nuclear fuel for both existing and future nuclear power requirements. This plan shall identify appropriate government funding and financing mechanisms, including utilizing the Department of Energy's Loan Program Office, that can augment funding provided, including through the Defense Production Act.

SECTION V. Reactor demonstrations and deployment

Key to establishing American leadership in advanced nuclear technologies are programs to demonstrate and deploy new reactor designs in real-world settings. These programs will concretely establish the bona fides of each reactor as meeting predetermined energy production goals in a safe and environmentally sound manner, enhance U.S. competitiveness in the world nuclear power market, and support defined national security requirements.

Existing demonstration programs include: the Department of Energy's Advanced Reactor Demonstration Program (ARDP) Pathway 1, under which two small modular reactors will be built and placed in operation by the end of the decade; other demonstrations and technology development efforts under and outside of the ARDP, including newly-provided funding for deployment of Generation 3+ reactor technologies through the Generation III+ Small Modular Reactor Pathway to Deployment Program; the Department of Defense's Project Pele, where a transportable micro-reactor will be demonstrated by 2026; the U.S. Air Force's stationary micro-reactor demonstration at Eielson Air Force Base in Fairbanks, AK, under which a commercially-built and licensed micro-reactor will be employed to power the base; and the U.S. Army's Advanced Nuclear Power for Installations pilot program, where micro-reactors will be employed to provide baseload electricity to two Army facilities.

To further expand American initiatives in bringing advanced reactors to the market, the following actions shall be taken:

(a) The Secretary of Energy, using existing authorities of the Advanced Reactor Demonstration Program (ARDP), consistent with the additional funding provided in the Consolidated Appropriations Act of 2024, and employing previously appropriated but currently unobligated clean energy funds, shall establish within 180 days of the date of this order the following cost-shared and competitively bid sub-programs:

- (i) No less than three commercial micro-reactor demonstrations, with a goal of having each reactor providing power by 2031. One of the micro-reactor demonstrations shall be used to provide electricity to a facility of the Department of Energy or the National Nuclear Security Administration.
- (ii) No less than two new small modular reactor demonstrations to provide electricity to data centers, with a goal of online operations no later than 2032. In establishing this program, priority shall be given to reactor technologies that are of appropriate size to be built on similar timelines as the construction of the accompanying data center.
- (iii) Three additional demonstrations of small modular reactor technologies, to demonstrate the integration of advanced reactors into industrial processes, with a goal of online operation by 2033. Industrial process applications include:
 - a. Chemical or hydrocarbon production or extraction;

- b. Hydrogen production, in concert with the existing Regional Hydrogen Hub (H2Hub) program;
- c. Large-scale desalination;
- d. Radioisotope production for medical and industrial applications; and
- e. Increased fuel utilization, fuel qualification, and burn-up of transuranic wastes using a fast neutron spectrum reactor.

(b) The Secretary of Energy shall request funding within one year of the date of this order to expand the existing Advanced Reactor Concepts 2020 (ARC-20) program, in order to provide additional government support for advanced reactor designs in their early phases of development. Additional funding shall be made available at current cost-share ratios to existing or new ARC-20 recipients to further mature viable technologies. Up to five reactor developers, either currently enrolled in ARC-20 or new to the program, shall be selected for this funding through a competitive process.

(c) The Secretary of Energy shall work closely with utilities, state governments, and the commercial nuclear industry, to identify suitable sites, including retired or retiring coal-powered generation plants suitable for siting of an advanced reactor, and prioritize such locations, as practical, for the demonstration programs listed above. This assessment shall be conducted within one year of the date of this order. This list of site locations shall be made public on the Department of Energy website.

(d) The Secretary of Energy shall complete feasibility studies by June 1, 2025, for the siting of advanced nuclear reactors in isolated and remote communities, in the United States and abroad, per Section 40321 of the Infrastructure Investment and Jobs Act of 2021.

(e) The Secretary of Energy, the Secretary of Defense, the Secretary of Homeland Security, and the Administrator of the General Services Administration shall within one year of the date of this order conduct a study and report to me on the feasibility of using small modular reactors and micro-reactors for powering federal facilities, including military installations. This report shall include a comprehensive list of federal sites suitable for future deployment of these advanced reactor technologies.

(f) The Secretary of Homeland Security, in coordination with the Secretaries of Energy and Defense, shall establish a program within one year of the date of this order to employ transportable micro-reactors for disaster response and recovery, selecting through competitive processes one or more vendors to demonstrate their technology in an operational setting no later than 2031. This program shall be carried out in coordination with micro-reactor demonstrations overseen by the Secretaries of Energy and Defense. Overdue congressionally mandated reports related to this provision shall be completed per Section IX(e) of this order.

(g) The Secretary of Defense, in coordination with the Secretary of Energy, shall; 1) take all appropriate steps to assure the completion of the Project Pele demonstration at the earliest opportunity, consistent with safety and environmental protection considerations; 2) designate an executive agent for the transition of mobile reactor technology to operational availability within the Department of Defense; and 3) provide me within 180 days of the date of this order a written assessment on the extent to which the use of transportable nuclear reactors could serve as a reliable power source in a global contingency characterized by contested logistics and denied commercial power.

(h) In addition to the Air Force micro-reactor demonstration being conducted at Eielson Air Force Base and the Army's Advanced Nuclear Power for Installations pilot program, the Secretary of Defense shall deploy micro-reactors to power no less than three additional military bases within the United States by 2031, with follow-on deployments of successful reactor technologies to no less than seven additional military bases by 2034. In establishing this program, the Secretary shall coordinate closely with other micro-reactor initiatives being overseen by the federal government and employ different micro-reactor technologies for each demonstration, unless an insufficient number of qualified vendors are available, and consistent with federal acquisition regulations. The Secretary shall prioritize deployment of fixed-site micro-reactors to military bases in the Indo-Pacific region and in Arctic environments. More than one micro-reactor may be deployed at each military base selected for this program.

(i) The Secretary of Defense shall provide to me within 90 days of the date of this order an assessment of which defense or task critical assets supporting national security priorities and requiring uninterrupted power and energy resiliency would enhance mission assurance by using on-site nuclear reactors as a power source. The Secretary of Defense shall include in this assessment consideration of nuclear reactors to serve as the primary power source for the modernization of the Nation's ground-based strategic deterrence program known as Sentinel. Overdue congressionally mandated reports related to this provision shall be completed per Section IX(e) of this order.

(j) The Secretary of Energy, in carrying out the establishment of four new research reactors authorized by Subtitle L, Section 10744 of the CHIPs and Science Act of 2022, shall; 1) develop and publicly release a plan for such research reactor deployment within 180 days of the date of this order, and 2) maximize the development and deployment of research reactor concepts that are commercially viable and that will promote American technologies for use in the global research reactor market.

(k) To enable accelerated deployment of advanced reactors, the Secretary of Energy shall establish within 180 days of the date of this order a Licensing Cost Share program to provide funding to industry, issued through competitive processes, for the development, submittal, and approval by the Nuclear Regulatory Commission of no less than 20 Early Site Permits and 30 Construction Permits or Combined Licenses. This program shall remain active through calendar year 2033.

(l) The Secretary of Energy, within 180 days of the date of this order, shall report to me on options for providing assistance to advanced reactor development projects, including those partially funded by the government, to assure completion of any project where unanticipated costs have arisen that endanger completion.

SECTION VI. Other advanced reactor considerations.

(a) The Secretary of Energy, within one year of the date of this order, shall establish a program to support subsequent deployments of advanced reactors and micro-reactors, past the first-of-a-kind demonstrations outlined in previous sections, to assure adequate federal support is provided until manufacturing economies of scale have been reached, but for no more than five follow-on deployments of each specific reactor design. The intent of this new program is to continue to assist reactor developers as they move from the expected higher costs of first-of-a-kind deployments to the expected lower costs of “Nth of a kind” deployments. The Secretary shall consider all options for providing such support, including direct cost-shared funding that is decreased incrementally after sequential deployments, cost-overflow insurance, or other concepts. Reactor demonstration projects currently receiving government funds as well as those funded by the private sector are eligible to compete for funding under this new program. The interagency Nuclear Power Project Management and Delivery Working Group, established in May 2024, will assist the Secretary and provide recommendations for this new program.

(b) The Secretary of Defense shall develop a Program of Record no later than 180 days of the date of this order for Project Pele and fixed-site micro-reactor demonstrations to allow the military services to train military personnel on the operation, maintenance, and safety related to these technologies, and to prepare for potential future deployment of mobile and fixed-site micro-reactors.

(c) To assure a follow-on to the Project Pele demonstration, and no later than December 2024, the Secretary of Defense shall establish a formal Program of Record, sponsored by the Chairman of the Joint Chiefs and a designated Secretary of a Military Department, to establish requirements, supply chain needs, and other elements needed for the utilization of deployable, mobile micro-reactors in expeditionary missions.

(d) In carrying out fixed-site micro-reactor demonstrations, the Secretary of Defense shall establish a policy and promulgate guidance to use Power Purchase Agreement authorities for the deployment, operation, replacement, and removal of a stationary reactor.

(e) The Secretary of Defense, in coordination with the Secretary of Energy and within one year of the date of this order, shall engage industry, academia, and other stakeholders to identify and map a Nuclear Energy Industrial Base structure analogous to the Defense Industrial Base, as a security imperative to support Department of Defense use of mobile and fixed-site micro-reactors.

(f) The Secretary of Energy shall present to me within one year of the date of this order a report assessing the strength of the domestic nuclear manufacturing supply chain, including but not limited to capabilities for producing pressure vessels, specialty materials, reactor internal

components, pumps, valves, electrical components, instrumentation and controls, and modular construction, and provide a plan to support any segments of the supply chain that are endangered or cannot support expected industry needs.

(g) The Chair of the Nuclear Regulatory Commission shall develop, within 180 days of the date of this order, a plan and budget to accelerate regulatory review and licensing for advanced reactor and nuclear fuel technologies, to assure that the technology-inclusive licensing framework mandated by the Nuclear Energy Innovation and Modernization Act of 2019 is in place and operational at the earliest opportunity, and no later than 2027. The Chair shall identify other areas for improvements in regulatory processes related to advanced nuclear technologies and pursue authority and funding for the same. Further, the Chair shall identify and report to me on proposed changes to the NRC's legislative authority, mission statement, organization, programs, and processes to recognize and integrate the societal benefits of nuclear technologies, and on the changes necessary to allow NRC licensing of advanced reactors in 12 months or less.

(h) The Secretary of Energy, the Secretary of Defense, and the Secretary of Commerce, in coordination with the Secretary of Homeland Security, the Administrator of the Environmental Protection Agency, and the Chair of the Nuclear Regulatory Commission, shall establish within one year of the date of this order guidelines for streamlining processes related to the siting of micro-reactors and advanced reactors for commercial use, including for transportable micro-reactor technologies.

(i) The Secretary of Energy shall complete a study, within 180 days of the date of this order, to evaluate options for expanding fast neutron testing capacity and capability within the United States, including means for reducing costs of the proposed Versatile Test Reactor or for employing alternative capabilities. The Secretary shall seek funding for additional test irradiation I-Loops at the Idaho National Laboratory Advanced Test Reactor for advanced reactors that employ Low Enriched Uranium as the basis for their fuel.

(j) The Secretary of Energy shall complete a study, within 180 days of the date of this order, to assess options for expanding the role of the National Reactor Innovation Center for reactor development, testing, and demonstration.

(k) The Secretary of Energy shall ensure that the advanced nuclear materials research, development, and demonstration programs authorized under Subtitle O, Section 10771 of the CHIPS and Science Act of 2022 are applied to maximum extent to support the reactor demonstrations listed in Section V of this Executive Order.

(l) The Secretary of Energy, in coordination with the Administrator of the Small Business Administration, shall establish within 180 days of the date of this order a program, as an expansion of the current Industry Funding Opportunity Announcement program, to support innovative start-up companies pursuing advanced nuclear technologies, through grants, funding opportunities, and other federal support, recognizing the financial pressures and high costs associated with nuclear-related projects.

(m) The Secretary of Energy shall develop and release program implementation guidance

within 180 days of the date of this order to carry out the National Nuclear University Research Infrastructure Reinvestment Act of 2021 authorized by Section 10742 of the CHIPS and Science Act of 2022.

(n) The Secretary of Energy, in direct consultation with the Secretary of Defense, shall contract with a federally funded research and development center within one year of the date of this order to establish an independent panel for the assessment of U.S. nuclear energy infrastructure capabilities and capacity at U.S. national laboratories and institutions. This panel shall assess capacity to support the research, development, test, evaluation, and deployment of nuclear energy systems, including advanced fuels, for national and energy security purposes. This panel shall report to me annually on such assessment, including estimated costs to modernize, replace, construct, operate, and dispose of these capabilities. Each Secretary shall provide 50-percent of the funding necessary to establish and maintain this independent panel.

(o) The Secretary of Energy and the Secretary of Defense shall report to me, within 90 days of the date of this order, on options to establish a joint office dedicated to the coordinated development and employment of advanced nuclear reactor technologies to meet energy resiliency requirements at Department of Defense installations and contingency locations, the Department of Energy's national laboratories, and other federal agencies.

(p) The Secretary of Defense, within 90 days of the date of this order, shall evaluate the use of advanced nuclear reactors to meet the power and thermal requirements of emerging defense-related industrial purposes, including the sustainable production of fuel, carbon capture, hydrogen production, desalination, and other critical military needs.

(q) The Secretary of Energy and the Secretary of Labor, in consultation with the nuclear industry, shall present to me, within one year of the date of this order, a plan for attracting, training, and retaining a modern nuclear workforce. Further, the Secretary of Energy, within 180 days of the date of this order, shall establish a university grant program for the purpose of increasing the number of undergraduate, graduate, and doctoral-level nuclear engineers and physicists completing courses of study at U.S. universities and accepting positions within the U.S. nuclear industry, with a goal of doubling graduation rates by 2030.

(r) The Secretary of the Interior, in consultation with the Secretary of Defense, shall assess the use of nuclear power for the Freely Associated States and U.S. Territories in the western Pacific region in the event of a disruption of existing fuel deliveries due to geopolitical contingencies.

SECTION VII. Space, maritime, undersea, and remote applications.

In addition to providing electricity and supplying high-temperature process heat for a variety of industrial purposes, innovative nuclear technologies, including advanced reactors and radioisotope power systems (RPS), can be used to support a broad array of specialty missions, activities, and industries. The following actions shall be taken:

(a) The Secretary of Defense, the Secretary of Energy, the Administrator of the National Aeronautics and Space Administration, the Chair of the National Space Council, and the Director

of the Office of Science and Technology Policy shall actively promote the use of advanced nuclear technologies for space-based activities, and explore options for using nuclear technologies for power, propulsion, and the establishment of livable environments in space and on the moon and other celestial objects.

(b) The Secretary of Energy and the Administrator of the National Aeronautics and Space Administration shall establish a program within 180 days of the date of this order to make available to commercial space nuclear development companies, at affordable cost, access to specialized government facilities needed to advance their technologies. In defining affordable cost, the Secretary and Administrator shall engage with industry to seek their views and recommendations.

(c) The Secretary of Transportation, within one year of the date of this order, shall designate the Federal Aviation Administration's Office of Commercial Space Transportation as the approval authority for commercial nuclear launches.

(d) The Secretary of Transportation, in consultation with the Secretaries of Commerce, Homeland Security, Defense, State, and Energy, shall within one year of the date of this order establish a program to evaluate and support the use of nuclear technologies to power commercial maritime shipping. This evaluation shall survey the technologies, benefits, and challenges of commercial maritime nuclear propulsion, including the use of potential maritime fuels such as hydrogen or ammonia that are produced through the use of advanced nuclear reactors.

(e) The Administrator of the National Aeronautics and Space Administration and the Secretary of Defense shall accelerate the current Fission Surface Power, Nuclear Thermal Propulsion, Demonstration Rocket for Agile Cislunar Operations, and Joint Emergent Technology Supplying On-orbit Nuclear Power programs, with goals of fielding operational fixed-site reactors and nuclear-propelled rockets for civil and national defense purposes no later than 2028, as authorized by Title VII, Section 10841 of the CHIPs and Science Act of 2022.

(f) The Secretary of Energy, the Secretary of Defense, and the Administrator of the National Aeronautics and Space Administration shall prioritize the development of advanced radioisotope power system technologies, pursuing an array of radioisotopes to augment the plutonium-238 currently in use, assessing at a minimum the use of strontium-90, curium-250, americium-241, and polonium-210.

(g) The Secretary of Defense, the Secretary of Homeland Security, the Secretary of Energy, and the Administrator of the National Aeronautics and Space Administration shall establish a joint program within 180 days of the date of this order to undertake research, development, and demonstration of advanced RPSs for space, undersea, and remote use. The following RPS demonstrations shall be conducted through competitive processes no later than 2029:

(i) The Secretary of Defense shall demonstrate two advanced RPS technologies for use in defense-related space operations.

(ii) The Secretary of Homeland Security and the Secretary of Defense shall jointly demonstrate two advanced RPS technologies for undersea applications.

(iii) The Administrator of the National Aeronautics and Space Administration shall demonstrate two advanced RPS technologies for use in civil space applications.

(iv) The Secretary of Energy shall demonstrate two advanced RPS technologies for use in remote surface locations, such as for unmanned weather stations in harsh environments.

SECTION VIII. Financial considerations and international cooperation.

In expanding American leadership in the nuclear energy arena, all elements of national financial power shall be used. The following actions shall be taken:

(a) The Secretary of Commerce and Secretary of State, in coordination with the Chair of the Export-Import Bank of the United States, the Chief Executive Officer of the U.S. International Development Finance Corporation, and the Secretary of Energy, shall develop and promulgate a strategy within 180 days of the date of this order to promote the wide range of American nuclear technologies for use overseas, consistent with the highest safety, security, environmental protection, and nonproliferation safeguards, and with particular foci on establishing American technologies as a superior alternative to those offered by Russia and China and for meeting COP28 nuclear deployment goals.

(i) This strategy shall include actions to increase efficiencies in the adoption of 123 Agreements and implementation of export controls to open new overseas markets to the broad range of American nuclear goods and services, and for expanding U.S. nuclear exports through funding provided by the Export-Import Bank and the Development Finance Corporation.

(ii) Further, in coordination with the Chair of the Nuclear Regulatory Commission, the strategy shall include actions to 1) expand civil nuclear regulatory cooperation to promote the adoption of sound foreign regulatory systems, to accelerate foreign licensing of U.S. technologies previously licensed by the Nuclear Regulatory Commission, and 2) where NRC processes and licensing standards for advanced reactors are still under development, facilitate parallel development with the foreign regulatory body on such standards.

(b) The Chair of the Export-Import Bank of the United States shall prioritize support for the development of nuclear capacity based on American technology.

(c) The Chief Executive Officer of the U.S. International Development Finance Corporation shall prioritize support for advanced nuclear projects that are based on American technology.

(d) The Secretary of Defense, the Secretary of Energy, and the Secretary of State shall evaluate opportunities to increase cooperation with allied nations on the development of advanced nuclear technologies for national security applications and shall report to me within 180 days of the date of this order with a recommended list of actions.

- (e) The Secretary of Energy shall enhance efforts to provide loan guarantee support for the wide range of advanced nuclear technologies, including advanced reactors, small modular reactors, micro-reactors, and nuclear fuel supply chain facilities. The Secretary shall report to me within 180 days of the date of this order on any recommended legislative changes needed to expand the use of federal loan guarantees to support advanced nuclear technology deployment.
- (f) The Administrator of the Internal Revenue Service shall immediately act to publish guidance to implement provisions in the Inflation Reduction Act of 2022 (IRA) pertaining to Zero-Emission Nuclear Power Production Tax Credits (IRC Section 45U), and shall provide Congress with a request to expand the credit to advanced nuclear power facilities.
- (g) The Administrator of the Internal Revenue Service shall immediately act to publish guidance to implement provisions in the Inflation Reduction Act of 2022 (IRA) pertaining to Clean Electricity Production Tax Credits (IRC Section 45Y) and Investment Tax Credits (IRC Section 48E) to include advanced reactors, small modular reactors, and new light water reactors placed into service after December 31, 2024, to qualify for the technology-neutral clean electricity production tax credit (the Clean Electricity PTC). The administration shall work with Congress to make permanent nuclear-related Production Tax Credits and Investment Tax Credits.
- (h) The Secretary of Energy, the Secretary of Defense, the Secretary of Commerce, and the Administrator of the Small Business Administration, in coordination with the Director of the Office of Management and Budget, in seeking innovative advanced reactor technologies, shall propose steps to me within 180 days of the date of this order to encourage and support small start-up companies, which face extreme challenges due to the high cost of entry into the nuclear energy arena.
- (i) The Secretary of Energy shall maximize the use of general exemptions to Part 810 export controls for allied nations that are not currently covered by agreements under Section 123 of the Atomic Energy Act.

SECTION IX. Administrative and personnel actions.

To provide necessary personnel and administrative resources, ensure consistency and coordination in government actions, and maximize efficiency among federal agencies, the following actions shall be taken:

- (a) The Assistant to the President for National Security Affairs shall establish on the National Security Council, effective immediately, a Senior Director for Civil Nuclear Energy, with coordination authority over all aspects of the nation's civil nuclear power enterprise. The Senior Director for Civil Nuclear Energy shall have the responsibility of developing a quarterly report that will be made available to the public, and that will describe the progress of federal agencies in carrying out the direction in this order. The first public report shall be issued no later than January 1, 2025, and quarterly thereafter.

(b) The Assistant to the President for National Security Affairs shall establish, effective immediately and building on existing committees, an Advanced Nuclear Technology Interagency Policy Committee (IPC). The IPC shall be led by the Senior Director for Civil Nuclear Energy and shall coordinate federal policy, technology development, and funding across agencies, with participants from:

- (i) The Department of Energy;
- (ii) The National Nuclear Security Administration;
- (iii) The Department of Commerce;
- (iv) The Department of State;
- (v) The Export-Import Bank of the United States;
- (vi) The U.S. International Development Finance Corporation;
- (vii) The United States Trade Representative;
- (viii) The Department of Defense;
- (ix) The Department of Homeland Security;
- (x) The National Aeronautics and Space Administration;
- (xi) An appropriate military service, as designated by the Secretary of Defense;
- (xii) The Office of Management and Budget;
- (xiii) The Small Business Administration;
- (xiv) The Office of Science and Technology Policy; and
- (xv) The Nuclear Regulatory Commission staff.

(c) The Secretary of Energy shall immediately conduct a review to assess if additional personnel or administrative resources are needed to fulfill the taskings of this executive order. As necessary, the Secretary shall reassign existing Department of Energy personnel and resources to the programs described herein and employ funds previously provided by Congress for energy-related programs, consistent with reprogramming guidelines. Further, should additional personnel or resources be needed, the Secretary shall seek authorization and funding for them within 30 days of the date of this order.

(d) The Secretary of Energy shall review internal guidance and programs, within 90 days of the date of this order, to ensure that nuclear power is included in Department of Energy definitions of “clean,” “renewable,” or “green” energy, and to promote the inclusion of nuclear energy development in certificates or credit as a renewable energy source. All cabinet-level agencies, their subordinate components, and independent agencies shall comport with these definitions.

(e) The Secretary of Defense and the Secretary of Energy shall complete all overdue congressionally directed reports required by legislation or committee reports that relate to advanced nuclear fuel or reactor technologies, programs, or associated matters, no later than 180 days from the date of this order.

SECTION X. Definitions.

(a) For the purposes of this Executive Order, and consistent with establish law, these definitions shall apply:

(i) **Advanced Reactor, or Advanced Nuclear Reactor.** Per section 951(b) of the Energy Policy Act of 2005, a fission or fusion reactor that has “significant improvements” over existing commercial reactors. Areas of improvement can include safety, waste generation, performance, resistance to weapons proliferation, modular sizes, and integration of electric and non-electric applications, such as heat and hydrogen production. This definition encompasses small modular reactors (SMRs) and micro-reactors of any type.

(ii) **Advanced Nuclear Technology.** Includes advanced reactors; advanced nuclear fuel technologies, including for conversion, enrichment, deconversion, and fuel fabrication; and advanced radioisotope power systems.

(iii) **Conversion.** The process of transforming uranium oxide (yellow cake) into uranium hexafluoride (UF₆). Conversion is a necessary step between uranium mining and enrichment.

(iv) **Deconversion.** The process of transforming uranium hexafluoride (UF₆) into uranium oxide or other chemical forms. Deconversion is a necessary step between uranium enrichment and fuel fabrication.

(v) **Defense Critical Asset.** A facility, installation, or asset under the control of the Department Defense that is deemed to be so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on national security, economic security, national public health or safety, or any combination of those matters.

(vi) **High Assay, Low Enriched Uranium.** Uranium having an assay greater than 5.0 weight percent and less than 20.0 weight percent of the uranium-235 isotope.

(vii) **Highly Enriched Uranium.** Uranium having an assay of 20.0 weight percent or more of the uranium-235 isotope.

(viii) Light Water Reactor. A thermal reactor in which light water (ordinary water) is used as a moderator as well as the reactor coolant. Light water reactors are the most common type of commercial nuclear reactor worldwide. Advanced Light Water Reactors are also referred to as Generation III+ reactors.

(ix) Low Enriched Uranium. Uranium having an assay greater than 0.711 weight percent and no more than 20.0 weight percent of the uranium-235 isotope. Typically, low enriched uranium used in light water reactors has an assay of 5.0 weight percent of uranium-235, or lower.

(x) Micro-reactor. An advanced reactor that has a power production capacity that is not greater than 20 Megawatts-electric. Typically, micro-reactors can be factory assembled and may be transportable.

(xi) Radioisotope Power System. A device that converts the heat generated by radioactive decay into electricity. Radioisotope power systems can be used to provide heat and electricity to a spacecraft or be used in terrestrial or subsurface applications.

(xii) Small Modular Reactor. An advanced nuclear reactor that has a power capacity of up to 300 megawatts (electric) per unit, which is about one-third to one-fourth of the generating capacity of conventional nuclear power reactors. Typically, a small modular reactor is physically a fraction of the size of a conventional nuclear power reactor and its systems and components can be factory-assembled and transported as a unit to a location for installation.

XI. General provisions.

(a) Nothing in this order shall be construed to impair or otherwise affect:

(i) The authority granted by law to an executive department or agency or the head thereof; or

(ii) The functions of the Director of the Office of Management and Budget, relating to budgetary, administrative, or legislative proposals.

(b) This order shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

(Signed)