



National & Global Landscape Subcommittee

FINAL REPORT & RECOMMENDATIONS

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Chairman: Senator Larry Craig

Members: Lane Allgood, Robert Edmonds, George Eskridge, John Kotek, Harold McFarlane, Tom Perry

Staff: Dwight Johnson

Overview of National & Global Landscape

1. America is blessed with an abundance of energy producing resources. All energy resources have benefits and burdens for society as they are developed and used.
2. The exceptionally low current price of natural gas (and the relatively low capital burden associated with building natural gas-fired electrical generation capacity) is having a negative impact on investment in any other energy resource development, including nuclear energy. However, the long-term viability and future of the supply of cheap natural gas is currently uncertain. Keeping a balanced supply of diverse sources of energy is important to our nation's strength and its security.
3. Nuclear energy currently provides about 20 percent of the nation's electricity production with 104 operating nuclear reactors. Because of low maintenance and fuel costs and modest future capital investment, they can currently compete favorably with gas-generated electricity.
4. Nearing the end of their 40-year licensed operation periods, many of the 104 reactors are will need to be replaced with some form of electrical generating capacity. One option is to relicense the existing nuclear plants. In fact, most of these plants are expected to apply for 20-year license extensions if warranted by safety and economic conditions.
5. Concern over air quality including greenhouse gases is a major driver for clean energy alternatives. Nuclear currently produces 70 percent of all clean electricity in the US. It will remain an essential element of any effort to improve air quality and to reduce the carbon footprint of energy production.
6. Nuclear offers an advantage over other low-emissions alternatives because it can provide "baseload" electrical generation – generation that is available 24 hours a day, seven days a week. While baseload electrical supply is critical for electrical grid stability, U.S. baseload generating capability has fallen markedly over the past few years as coal-generating capacity has been retired.
7. Several companies have proposed the construction of up to 26 new commercial nuclear power reactors in the U.S. However, due to the low cost of gas-fired generation and other issues (including high construction costs, long construction timeframes, and the inability of the federal government to implement a workable loan guarantee program for nuclear power as established under the Energy Policy Act of 2005), it appears that only the two new reactors under construction in Georgia and the two being built in South Carolina are likely to proceed this decade.
8. The nuclear industry is still growing internationally due to concerns about the environment and energy security. There are currently more than 430 nuclear reactors currently operating worldwide with about 60 under construction and another 150 new reactors planned. South Korea, China, India and Russia are moving forward aggressively with nuclear energy production and with the development of nuclear manufacturing, construction and operational expertise.
9. Outside of Europe and Japan, the concerns raised by Fukushima are not diminishing this long-term international interest and demand for nuclear energy. Regulators in the U.S. and in other leading nuclear nations are responding prudently and putting necessary changes in place to deal with extreme external events and improve public confidence. While the safety of the global nuclear enterprise should become even better as result of these efforts, many of post-Fukushima recommendations had already been implemented in the U.S. after 9/11.

10. It is in America's national security interest to be a leader in nuclear energy development. As more countries with less-developed safety and nonproliferation cultures, limited legal structures and a lack of skilled workers pursue nuclear energy production, safety and nuclear proliferation concerns could increase. Reassertion of American leadership in the commercial nuclear energy sector and in nuclear energy research and development is critical to help address these concerns.
11. There is a great interest in the development of Small Modular Reactors (SMRs), that may be able to produce energy with less upfront financial risk but their overall economic viability is currently uncertain. The U.S. nuclear infrastructure can be adapted or augmented to allow SMR manufacturing; this could offer an economic development opportunity to states with a favorable business climate and established nuclear capabilities.
12. The immediate opportunities from U.S. Department of Energy for nuclear research are centered on the fuel cycle in the development of advanced fuels, and in the disposal and storage of spent nuclear fuel and other high-level nuclear wastes. States who are willing to engage in establishing or expanding storage facilities for spent fuel and high-level waste will hold a competitive advantage for receiving research funds directed at the back-end of the fuel cycle.
13. The Settlement Agreement entered into by the State of Idaho in 1995 has proven to be a very effective means of ensuring federal commitments related to nuclear waste management are met. In fact, the Settlement Agreement was held up by the Blue Ribbon Commission on America's Nuclear Future as an example for future federal/state nuclear waste management agreements.
14. While the Settlement Agreement has given the state important leverage, there is no guarantee in the Agreement that the federal funding needed to meet waste cleanup commitments under the Agreement will be included in annual federal budgets. Idaho's Congressional delegation has played a very critical role in aggressively securing the necessary funding.
15. Idaho needs to address the state's nuclear energy policy now. The economic benefits of national and global nuclear energy expansion, research, development and demonstration of new technologies, and developing solutions to waste, safety and nonproliferation issues are clear.
16. The successful track record in meeting Settlement Agreement milestones has created an environment in which the State of Idaho has concluded it is in the state's best interest to exercise some of the flexibility built into the agreement as it pertains to commercial nuclear waste shipments. For example, on top of 216 canisters of Navy spent fuel and over 75 shipments of other spent fuel into Idaho conducted under the Settlement Agreement, the state has also allowed small quantities of commercial reactor fuel to be shipped into Idaho for research purposes. This flexibility on the part of the state has attracted millions of dollars of equipment and research funding to Idaho and has helped cement the INL's role as the nation's lead nuclear energy laboratory.
17. The Idaho National Lab is the national flagship research facility in nuclear energy. Further, Idaho is host to several companies that are important suppliers of nuclear-grade equipment, medical isotopes, engineering expertise and other goods and services.
18. The commercial nuclear industry in the U.S. consists of owners/operators and vendors. The former are electric utilities that in the decades since our 104 commercial power reactors were build have focused their resources on improving the safety, reliability and economic performance of their nuclear power plants. The vendors, the Westinghouse's, GE's, B&W's and Combustion Engineering's have atrophied,

been subject to foreign acquisition and consolidation. Today they constitute a service industry that supports operation and maintenance of the products they developed decades ago. While still producing fuel, some core components and instrumentation and control systems, their capability to design and produce many essential nuclear power plant components has declined significantly. The U.S. has largely “de-industrialized” in this sector.

Recommendations

The Commission makes the following recommendations to maintain Idaho's ability to chart its own destiny as the national and global nuclear enterprise evolves.

1. Idaho should establish a permanent Nuclear Energy Commission or Council -- This entity would provide periodic review of, and make recommendations regarding the burdens and benefits of the Idaho National Laboratory (INL), the commercial nuclear sector, and nuclear energy policy to the Governor. Such a council or commission will create a comparative advantage for the state of Idaho relative to other Department of Energy facility-hosting states. The South Carolina Governor's Nuclear Advisory Council is an example of what such an entity might look like.
2. The State of Idaho should aggressively highlight the importance of the INL to our nation's energy future. To accomplish this goal the LINE Commission recommends the Governor take following actions:
 - a. Work with Idaho's Congressional Delegation to persuade policy makers of the advantages of consolidating nuclear energy research at the INL – Idaho must make the case to Congress, Office of Management & Budget (OMB), and Department of Energy (DOE) that federal fiscal responsibility and broader national interests are best served by concentrating and consolidating the nation's nuclear energy research capability, to the maximum extent practicable, in Idaho at INL. Specific points of emphasis should include, but not be limited to, the unique capabilities of INL, the strong statewide and regional support for nuclear energy and INL, and the exceptional history of the DOE's work in eastern Idaho - including the role Idaho has played in accepting, managing, and storing federal government owned used nuclear fuels.
 - b. Visibly engage in the American Nuclear Society's Global 2013 conference -- Through the planning, promotion and staging of this event that will be held in Salt Lake City commencing Sept. 29, 2013 the state can increase its visibility as a leader in nuclear energy.
 - c. Develop a communique on INL's benefits – This communique would be helpful to express the findings of the LINE Commission that INL's national nuclear capabilities and distinctive service as "The National Nuclear Laboratory", merits continued assignment of, and funding for associated national security and nuclear nonproliferation work.
 - d. Host a Western Regional Energy Summit – In conjunction with the INL, Idaho could host a regional summit to promote a strong political voice for a "Western Energy Corridor" made up of Idaho, Montana, North Dakota, Utah, Wyoming, Alberta, and Saskatchewan to become energy providers for more populous states and province. This effort could help expand access to the INL as a Research and Development enterprise for the entire region.
 - e. Explore the possibility of the State becoming a member of the National Energy Institute (NEI) and/or World Nuclear Association (WNA) -- Either directly or through its Nuclear Commission/Council or through the Department of Commerce the state could enhance its voice nationally on nuclear energy issues if it had membership within these organizations.
3. Idaho should closely monitor private and community efforts going on nationally that seek to house spent nuclear fuel. Idaho should encourage federal legislative efforts to implement the recommendations of the Blue Ribbon Commission on America's Nuclear Future to adopt a consent-based siting process for spent nuclear fuel management facilities. Such legislation should include creation of an entity with the ability to make binding commitments to states and communities without dependence on the annual appropriations process to secure the necessary funding to uphold those commitments. While it is too

early to make a recommendation regarding an expanded future role for Idaho in commercial spent nuclear fuel storage and management, any such role must be considered in the context of a consent-based process – period.

4. Expand the role of Idaho's universities in INL activities -- Idaho universities could help INL advise and assist nations that want to start or expand a peaceful nuclear energy program. The universities could also take advantage of INL's cutting edge research to develop unique nuclear science and technology courses that could help catapult Idaho into the elite echelons of nuclear engineering education.
5. Support new processes for Research, Development, Demonstration and Deployment (RDD and D) and Public-Private Partnerships (PPP) -- RDD and D of nuclear energy technologies requires significant government involvement. The short-term costs, industrial risks, potential for misuse and stringent regulatory requirements necessitate this. Additionally, the contributions nuclear energy makes to national security, energy security, environmental security and economic competitiveness are all long-term and outside the domain of short-term market forces. DOE facilitates public-private partnerships in RDD and D through contractual mechanisms called Cooperative Research and Development Agreements (CRADAs) and Work for Others (WFOs). These mechanisms only partly facilitate nuclear PPPs because of their limitations in financial risk sharing, indemnification, intellectual property rights and other typical commercial terms and conditions. DOE recently created a mechanism called Agreements to Commercialize Technology which offers little potential to improve this situation as it applies to nuclear technology. The State of Idaho should encourage its Federal delegation to examine this issue and create some new mechanisms to support PPP in RDD and D of nuclear energy technologies.
6. Pursue SMR investment – One of the greatest opportunities for Idaho seems to be in the field of Small Modular Reactors (SMRs). SMR designs have been developed in recognition of the fact that not all energy markets are well suited to the one thousand megawatt and above capacity offered by a typical reactor design. SMRs are intended to serve both U.S. and global need for nuclear energy systems with smaller electrical output. Because states that get involved early will have a competitive advantage in attracting manufacturing investment if SMR markets materialized, Idaho should charge the Department of Commerce to work directly with SMR developers to tout Idaho's advantages (including a skilled nuclear workforce, low energy costs, pro-business environment and access to road, rail and barge transportation) and to explore the types of incentives that would make the state more attractive as the host of an SMR demonstration or an SMR manufacturing facility. As part of these efforts, the department should explore the implementation of clean energy and other incentives. Such incentives will be most effective if they can lower the cost of the up-front capital needed to construct a demonstration plant.