PRESIDENT'S MESSAGE

Making the Case for Nuclear Power in the United States

Will nuclear power in the United States flourish or fade away? To paraphrase Mark Twain, "The news of nuclear power's demise has been greatly exaggerated." The United States still has the largest number of nuclear reactors in the world with 104 and almost 20 percent of its electricity is generated from nuclear power. Moreover, four new reactors are under construction: two at the Vogtle plant in Georgia and two at the Summer plant in South Carolina. One big reason these plants are moving forward is because the utilities can recoup some of the costs during construction. The regional regulatory authorities in the Southeastern United States have allowed such cost recovery. Four new reactors, however, will not be enough to keep nuclear power on pace to continue to generate about 20 percent of the nation's electricity.

Utilities that don't have the cost recovery option are less likely to build new nuclear plants because of the increasing competition from cheap and abundant natural gas, especially the bonanza of gas unlocked by hydraulic fracturing in recent years. Also, the U.S. nuclear fleet has entered its middle age with a retirement cliff looming in 20 years.

Reactors initially received a license for 40 years of operation. The average age of U.S. reactors is well past 30 years. While almost all plants that have applied for a 20-year license extension have been granted such from the Nuclear Regulatory Commission, it will be a much bigger stretch to extend reactors' 'lives even further despite nuclear technologists' interest in doing so. After 60 years of operations, reactor pressure vessels would have experienced intense damage from neutron bombardment. Investment in continuing R&D could ultimately result in discovering techniques to cost-effectively repair this damage and extend the life of the plants. While needed, this will not result in new plants.

For more plants to be built, nuclear power will have to make the case based on the three legs of the energy policy triangle: economics, security of supply, and the environment.

Concerning the economic assessment, the problem nuclear power faces is short-term high capital costs versus the long-term favorable financial payoff for well-run plants. In particular, the capital costs for construction can account for 60 to 70 percent of the total lifecycle costs while operations, maintenance, fuel, and decommissioning make up the remaining relatively small fraction. Because investors have perceived nuclear power construction as risky, they have demanded a high-risk premium be paid on their investments. This drives up the financing costs. The federal government has offered a few tens of billions of dollars of loan guarantees to ease the financing. But relatively high credit fees to obtain the loan guarantees have made several utilities reluctant to apply. A longer term financing mechanism could help such that investors would reduce the interest rate they demand in the short term but would reap

The United States also needs more wind and solar power, which are renewable sources. But the choice is not either these or nuclear power. Americans need both. The intermittent wind and solar sources can complement base-load sources such as nuclear power. A base-load source can run at constant high-level power for a relatively long period before shutdown for maintenance. Natural gas also complements these other sources because a gas power plant can run at either peaking or base-load operations. Peaking power sources can be turned on quickly to meet rapid changes in electricity demand.

Regarding security of supply, nuclear power provides a "good news" story. While the uranium needed to fuel the current fleet of reactors comes largely from foreign sources, these supplier states are mostly very friendly to the United States. Also, uranium is very dense and thus easy to stockpile. Moreover, utilities can greatly reduce the risk of supply disruptions by staggering fuel contracts among the handful of major fuel suppliers. If one supplier reneges on a contract, another supplier can meet the demand.

Next year, the nuclear fuel deal with Russia will expire. This Megatons-to-Megawatts deal will have converted 500 metric tons of uranium from Russian nuclear weapons to nuclear fuel for about half of the U.S. reactors. The expiration of this deal could stimulate revival of the U.S. domestic uranium mining and milling industry or could spur growth in uranium imports from Australia, Canada, and Kazakhstan, the three biggest global suppliers, or from other suppliers. The bottom line is that there is no need for concern about a shortage of uranium supplies for decades to come.

Although commercial nuclear power does not have a perfect environmental record due to major contamination from the 1986 Chernobyl accident and the 2011 Fukushima Dai-ichi accident, I would argue that, on balance, nuclear power is a comparatively wise choice from an environmental perspective. No nuclear plant is inherently safe, but the most modern plants are safer than the older generation plants. And safety improvements on the older generation plants can significantly reduce the likelihood of accidents and mitigate the environmental consequences if an accident occurs. Concerning emissions from plants during normal operations, a nuclear plant emits no greenhouse gases. In comparison to coal plants, nuclear power plants do not emit toxic arsenic or mercury. Coal plants produce mountains of coal ash while nuclear plants result in highly radioactive waste that is much more compact in its volume. This radioactive waste will decay to relatively low radioactivity levels in a few hundred years whereas coal ash will last forever. According to the September 2010 report "The Toll from Coal," by the Clean Air Task Force, coal plants in the United States will contribute to more than 13,000 premature deaths. Barring major accidents and massive releases of radioactive contamination, nuclear power is comparatively benign.

If the external environmental and health costs from coal plants were included in its price, nuclear power would become cost competitive. Even without that explicit extra cost to coal, a case can and should be made for more nuclear power plants in the United States.

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