



# GENERATION

NEXT GEN TECHNOLOGY FOR THE NEXT GENERATION

## **THE DECENTRALIZATION OF NUCLEAR RESEARCH AND DEVELOPMENT REGULATION WILL LEAD TO GREATER DOMESTIC INNOVATION IN NUCLEAR TECHNOLOGIES**

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Many will argue that the United States federal government tries to accomplish too much in its ever expanding mission to be all things to all people. The list of things that the federal government excels at is small and gets smaller as our federal government expands in size, scope, and complexity.

When the United States gained its independence more than 200 years ago, the founding fathers enumerated and limited, the responsibilities of the federal government for a reason. They recognized that the larger a centralized government becomes, the less freedom people have to follow their dreams. Dreams, and the pursuit of happiness, spark innovation within free markets. The founders, with permission of the States, wisely gifted only a few enumerated responsibilities to the federal government, and these responsibilities pertain mainly to protecting the security of the nation and preserving public safety. The founders never envisioned a federal government interfering in the daily lives of its citizens, or even in restraining States from competing with each other.

### **The Federal Government Actually Working as Envisioned**

The U.S. has realized in the past, with the very existence of the nation at stake, that the U.S. Constitution, and thereby the federal government, worked as the founders intended and provided Americans security.

During WWII, the U.S. military rose to the occasion and fashioned a program to develop nuclear weapons known as the Manhattan Project. Shortly after America dropped nuclear bombs on Japan, WWII ended. WWII was won, in large part, through delivering technological supremacy on the battlefield and leveraging the advancement of science for military purposes. Had the U.S. not engaged in the competition to deliver superior technology to the battlefield the Axis forces may well have won WWII.

During the Cold War, the U.S. was again challenged for technological supremacy. This time by the might of the Soviet empire in a space race to the moon. Again, the U.S. won by delivering superior technology that beat the Soviet Union to the moon. Both successes for the U.S. were the result of a competition between nations.

When the federal government is not competing against foreign nations externally, Americans are best served when our States and businesses are competing internally against each other. This pushes the boundaries of science and human progress. Unfortunately, when the federal government takes on a responsibility and faces no competition, its federal supremacy normally equates to States and businesses no longer being able to substantively participate in competitive enterprises with each other.

While the space race garnered many private sector spin-off technologies that led to such things as cell phones, GPS, and communication satellites, the same cannot be said to the same degree of the Manhattan Project after the Cold War ended. This is in part due to onerous regulations imposed on the nuclear industry by the federal government. Ironically, the technology that once secured our freedom has stagnated to such a degree after the Cold War's end that it potentially faces economic extinction. Not only has the American Nuclear industry been slow to innovate after the fall of the Soviet Union in 1991, but regulations on nuclear research and development have become so economically egregious within the U.S. that the U.S. has essentially ceded its superiority in nuclear technology to nations such as Russia and China.

### **Competition is the Mother of Innovation**

To innovate within the nuclear space, the U.S. must foster competition within the domestic nuclear industry. This can best be accomplished locally. While the U.S. still faces security threats from countries like Russia and China, the competition to develop nuclear technology is largely a commercial competition and, at least not presently, an immediate dire national security related threat. This does not mean that peaceful nuclear technologies cannot very quickly become a national security threat. The development of nuclear technology for the commercial sector is a competition that the U.S. federal government is not best suited to win. On the other hand, this is exactly the type of competition that our founding fathers envisioned for the States.

### **The 1954 Atomic Energy Act**

In 1954, Congress expressly did not want to interfere with a State's ability to pursue their own nuclear research and development. But Congress also wanted to ensure public safety pertaining to all things nuclear. Congress correctly acknowledged that nuclear research and development without expertise would most likely be a danger to the nation. The path Congress chose was as States gained expertise with nuclear technologies the States would be given more autonomy in developing their own nuclear ambitions. While States have been given the authority to regulate some of their nuclear materials by the United States Nuclear Regulatory Commission (USNRC), neither the USNRC nor the United States department of Energy (USDOE) have yet to develop rules or create joint collaborative development programs that would allow States the freedom to independently pursue substantive independent development pathways for peaceful new nuclear technologies. In fact, Congress expressly wrote State participation into the Atomic Energy Act of 1954.

Here are some provisions of the Atomic Energy Act:

- “to promote an orderly regulatory pattern between the Commission and State governments with respect to **nuclear development** and use and regulation of byproduct, source, and special nuclear materials”

- “to encourage **widespread participation in the development and utilization of atomic energy for peaceful purposes** to the maximum extent consistent with the common defense and security and with the health and safety of the public”
- “provide for a **program of conducting, assisting, and fostering research and development** in order to encourage maximum scientific and industrial progress”
- “a program of administration **which will be consistent** with the foregoing policies and programs, **with international arrangements**, and with agreements for cooperation, which will **enable the Congress to be currently informed so as to take further legislative action as may be appropriate.**”

### **The End of the Atomic Energy Commission Purposefully Hurt Nuclear Development**

While the Atomic Energy Commission (AEC) was both regulator and developer of nuclear technology prior to 1975, subsequent legislation separated these responsibilities to the USNRC and the USDOE respectively. As the AEC was dissolved in 1975, the lack of State participation at that point was assumed as a foregone conclusion as the federal government was still fully engaged in the Cold War and the federal government dominated legitimate control over the nuclear industry for national security purposes. With the election of Jimmy Carter as President in 1976, a decidedly anti-nuclear, pro-renewable energy policy was embraced by the White House. One of Carter’s first policy initiatives during the Arab oil embargo, that left Americans in long lines fighting for gasoline, was to create the U.S. Department of Energy. From its inception, the USDOE has been used as a political tool to push the agenda of incoming presidential administrations. The 1979 meltdown of Three Mile Island nuclear power plant in Harrisburg, PA seemed to be fortuitous for radical environmentalist and for anti-nuclear activists alike. This was followed by an all-out assault on the nuclear industry from Hollywood in an attempt to shape the perception that companies operating nuclear power plants wanted to put everyone’s life in danger. The Three Mile Island meltdown gave a mandate to those politically appointed by Carter within the USNRC to begin ratcheting up costly regulations within the Nuclear industry, and those appointed to the USDOE focused their energies on promoting renewable energy and energy conservation. The legacy of Carter within these agencies largely remains in place to this day.

### **Decentralization of Research and Development Authority Power is Key to Innovation**

The U.S. currently determines the gold standard in nuclear safety around the world, thanks to the hard work of the USNRC. Unfortunately, the U.S. is no longer the gold standard for nuclear research and development. Many within the domestic U.S. nuclear industry will point to the costly regulations imposed by the USNRC that prevents greater private sector and State participation in developing new nuclear technologies.

The USDOE is not part of the free-market and even with private sector participation, many American companies interested in developing new nuclear technologies are choosing countries like China to help develop their technologies where they are not saddled with the same costly research and development regulations. In the case of Westinghouse, the USDOE signed an agreement to help them develop advanced Molten Salt Reactor (MSR) technology in China.

If USDOE truly wants to spark nuclear innovation within the U.S. again, the USDOE should be allowed, encouraged, or directed by Congress to sign collaborative agreements with States that will extend the USDOE’s authority to develop nuclear technology outside the auspices of USNRC regulations; no different

than the USDOE currently inking development agreements with foreign nations outside of the control of the USNRC. These agreements will allow States to participate on an equal footing with foreign nations in developing nuclear technologies..

### **USDOE Collaborative Research and Development Agreements with States**

To spark continuing and long lasting development of nuclear technologies within the United States, beyond this administration and into the future, the USDOE should decentralize its nuclear research and development authority. This can be accomplished by directing the USDOE to promulgate rules for State led research and development activities. Allowing States to determine some of the risks they are willing to accept in developing new nuclear technologies puts the decision making authority closer to the people that will be affected by such decisions. Who better to make those decisions? States that sign Collaborative Research and Development Agreements with the USDOE's oversight are bound by USDOE regulations and regulations that State regulatory bodies may impose.

### **Why Not Simply Direct the USNRC to Promulgate New Rules for Nuclear Research and Development?**

The USNRC does not have a mission to promote greater research and development into new nuclear technologies. Because of this, it is doubtful that if the USNRC did develop regulations for States, that those regulations would be economically viable. The USNRC only has a mission to provide safety for nuclear technologies. It would be legally challenging at this point for the USNRC not to impose the strictest set of regulations for research and development activities.

The USDOE arguably, does have the mission to encourage maximum scientific and industrial progress within the nuclear industry. Utilizing the USDOE's authority to extend to States for research and development is much easier than repurposing the mission of the USNRC. Under the authority and guidance of the USDOE a State may allow for simplified streamlined procedures be adopted to foster progress, accepting that greater risks may be taken than what might be allowed under the auspices of the USNRC. This is a decision that would be made between the USDOE and the State government.

### **How Can We Improve the Role of the USNRC in Advancing Innovation and Progress?**

The USNRC excels at developing rules and safety guidelines for technologies that are already commercialized. The entire process the USNRC has for developing new type nuclear technology rules and regulations are so convoluted and repressive that only very large and wealthy corporations can afford to participate. This stifles innovation and creativity. Allowing independent and accelerated development under the oversight of the DOE and State regulatory bodies for nuclear research and development **only** will facilitate bringing more technologies out of the concept and demonstration phases, and into the commercialization phase where the USNRC does excel.

In America, it has become well-established that the public has lost confidence in the USDOE, due largely to its politicization. Some believe a new federal agency or federal corporation could be "less vulnerable to political interference." But simply shifting research and development responsibilities from one federal government entity to a new federal government entity would only give the appearance of progress. Any new federal government entity would be equally as prone to failure, as such an approach does not address the underlying problems of the current system. Congress should direct the USDOE to decentralize the responsibility of research and development in the nuclear industry, and establish collaborative local health and

safety guidelines with State governments. State governments are normally better at incubating fruitful private sector development activity because they are closer to the businesses within their State and have a more vested interest in the success of businesses within their State.

### **Saving Taxpayer Money**

Allowing States to leverage private sector funds to develop new nuclear technologies can lead to a massive reduction of federal funds needed to encourage the development of new nuclear technologies. Allowing States more freedom to answer the question of safety and security pertaining to nuclear research and development expands opportunities to develop more ground breaking technologies that cannot be economically developed under USNRC regulations. Opening independent research and development to the States opens the possibility of a diversity of options and a thriving domestic nuclear market.

### **Progress vs. Risk**

It is important to keep in mind that all human activity comes with risk. Ironically, imposing drastic measures to reduce the risk may actually increase the risk in the long run. The drastic measures themselves can make the activity opaque and difficult from which to learn. The ability to rapidly modify and observe results in knowledge growth that can direct the next steps to reduce risk while improving desired outcomes. Over time, this “learn and modify” model produces new technologies that can provide superior risk/reward results. Only by trying new things and learning from the trial do we really improve in both performance as well as safety.

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