THIRD WAY

GRAPHIC *Published October 17, 2019 • 3 minute read*

2019 Advanced Nuclear Map

John Milko
Climate and Industry Consultant, Climate and Energy Program

Jackie Kempfer
Former Senior Policy Advisor, Climate and Energy Program
@JackieKempfer

Todd Allen
Senior Visiting Fellow
@ToddAllen5

Getting to Zero Emissions by 2050

To mitigate the most serious threats posed by climate change, we must get to net-zero carbon emissions as fast, and fairly as possible. This means using every clean energy technology we have and investing in innovation to create or improve the clean energy technologies and fuels we still need to eliminate climate pollution in every sector of the economy.

One of the most promising new technologies to help get to zero carbon is advanced nuclear power, which could be paired with renewables to generate electricity, provide heat and power for industry, or produce hydrogen. Since 2015, we have been tracking the evolution of advanced nuclear

innovation projects in the United States and Canada. As new industries mature, it is natural and necessary for some projects to close while others hit their stride.

The big news: the number of private sector advanced nuclear projects grew by 19% from 54 to 64 since our 2018 report, even as the overall number of projects decreased slightly (from 75 in 2018 to 71 in 2019). This shift represents an important evolution from academic research projects toward the private sector as advanced nuclear gets closer to commercialization. Other key observations:

- Five companies are already working with the Nuclear Regulatory Commission to prepare for licensing, and NuScale just completed the third phase of the first ever, small modular reactor design-certification application process.
- While 14 university or government-funded projects, which contributed valuable research to the field, completed their funding cycles, the number of private sector projects grew from 54 to 64.
- We identified three accelerator driven system projects, one advanced nuclear fuel company, eight high temperature gas reactors, 12 liquid metal-cooled fast reactors, one microreactor, nine molten salt reactors, five nuclear battery companies, eight small modular reactors, and two super-critical reactors.
- Projects are spread across 24 different states and provinces. California and Washington are home to largest number of projects with 11 and 10, respectively.
- Six new companies emerged from the ARPA-E Alpha fusion portfolio, helping to form the Fusion Industry Association, which now has 19 member companies. The number of overall fusion projects grew from 19 to 22.

Policy and Licensing Momentum

Since our last map in 2018, overwhelming, bipartisan majorities in Congress passed, and the President signed into law, the Nuclear Energy Innovation and Modernization Act (NEIMA) and the Nuclear Energy Innovation Capabilities Act (NEICA). These policies will accelerate the modernization of the Nuclear Regulatory Commission (NRC), provide needed financial support and resources towards the development of advanced reactor fuel, and increase opportunities for developers to collaborate with universities and the national labs. The Nuclear Energy Leadership Act (NELA), introduced in both the Senate and House in 2019, would help advanced nuclear transition from research toward commercialization by matching private capital to assist in the building of two different demonstration reactors by 2025 and as many as five additional designs by 2035. It would also enable the federal government to be an early customer for the zero-carbon electricity produced by the advanced nuclear plants, by allowing for 40-year power purchase agreements.

Conclusion

As our 2019 map shows, advanced nuclear innovation has progressed quite rapidly over the last four years. Its emergence as a viable, cost-competitive solution for clean electricity, as well as process heat for industry, could play a critical role in addressing climate change. This is a technology, and a sector, that is still in the relatively early stages of development. As demonstrated by the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative, the federal government plays an important role in helping to spur innovation in this sector. By providing innovators with the regulatory space and resources they need to scale their technologies, we can help bring them to market over the next decade and beyond. Given the progress of the last several years, advanced nuclear is shaping up to be a key component in our race to zero emissions.

TOPICS

NUCLEAR 198