THIRD WAY

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Introducing the Advanced Nuclear Industry

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The energy sector has experienced enormous technological innovation over the past decade in everything from renewables (solar power), to extraction (hydraulic fracturing), to storage (advanced batteries), to consumer efficiency (advanced thermostats). What has gone less noticed is that nuclear power is poised to join the innovation list. Third Way original research has identified a new generation of engineers, entrepreneurs, and investors, along with several established nuclear companies, who are working to commercialize innovative and advanced nuclear reactors in North America. In total, we have found over 45 projects in companies and organizations working on small modular reactors, advanced reactors using innovative fuels and alternative coolants like molten salt, high temperature gas, or liquid metal instead of high-pressure water, and even fusion reactors, to generate electricity.

These companies are being built and funded because the innovators and investors see profit in creating an answer to the global energy paradox – there are 1.3 billion people in the world without access to reliable electricity; they will get that electricity, and advanced nuclear can provide it to them while

cutting global carbon emissions. Our table and map of the advanced nuclear industry in North America is the most comprehensive listing to date of who is working on these reactor designs. In compiling this list, four important trends became clear:

1. Coast to Coast: Research is not isolated to one state or even one coast. The companies and organizations leading the design revolution reach up and down both the East and West coasts of the United States and into Canada. In all, twenty different states host entities researching advanced nuclear energy.

2. One Size Doesn't Fit All: In interviews Third Way conduct with many of the companies on this list, we found real diversity in size and structure, ranging from lone entrepreneurs, to venture capital supported university spin-offs, to large international corporations. Each is making strides and bringing a unique perspective to the industry.

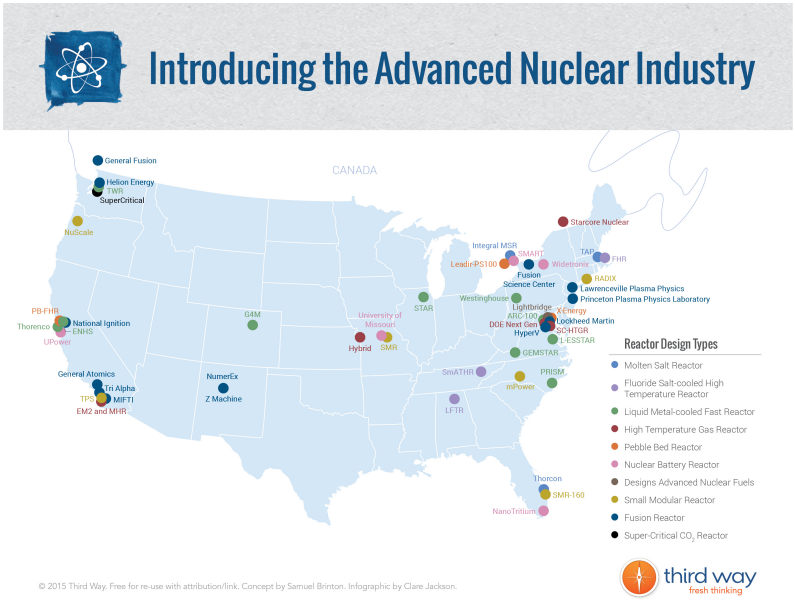
3. A Compendium of Coolants: While water does a great job of cooling and moderating the atomic fissions of nuclear reactors, the next generation of nuclear reactors is looking to broaden our options. These include liquid metal, high temperature gases, and molten salt. Nuclear reactors using these coolants can be even safer than most light water reactors. The higher operating temperatures of coolants like helium, liquid metals, and molten salts more readily lend themselves to industrial applications requiring high temperature process heat.1

4. Not Just Fission Anymore: Along with the evolution from large light water reactors to small modular reactors and beyond, Third Way has found major investment and interest in nuclear fusion from both small and large companies. Though this technology has much left to refine before commercialization, the growth has been staggering.

When thinking of the emerging advanced nuclear industry, it is important to understand how it compares to other sectors with a number of potentially new entrants. Let's take the

Internet. On the surface, there are similarities. As with the Internet today, the advanced nuclear space includes startups led by recent Ph.D. graduates, established Fortune 500 multinationals, and everything in between. And just like Internet companies, financing includes seed capital provided by angel investors, investments by established venture capital firms, and companies spending their own capital on significant R&D budgets.

The differences between the advanced nuclear companies and the companies spurring the latest Internet revolution are just as important. While the latest software or hardware improvement can take significant funding and research, the dollars and time required are a relative pittance in comparison to the funding necessary and regulation that must be navigated to design and build a new nuclear reactor. But despite these obstacles, at least 44 companies and organizations are moving ahead, and a decade from now we may be seeing a brand new reactor revolutionizing the energy industry.



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