

# Advanced Reactor Projects

Three dozen firms representing \$1.3 billion of investor money are pursuing technological innovations in the field of nuclear energy. A June 2015 [report by the Third Way](#), a Washington, DC, think tank, details the mix of firms in the U.S. and Canada which includes small startups and big-name investors like Bill Gates. All are placing bets on a comeback for nuclear energy working to get their respective technologies to market in an increasingly carbon-constrained world. >>[See Directory following this text below](#) <<

Samuel Brinton, the report's author, spoke by phone with this blog about the report. Brinton, who is an MIT graduate in nuclear engineering, said that most of the startups are seeking to develop smaller and more efficient nuclear reactors. If successful, they will be the answer, collectively, to the anti-nuclear rant of now former VP Al Gore who once told a congressional committee that all reactors all come in one size – large.

Some of the most interesting characteristics of the new designs are that they are engineered to use spent nuclear fuel. Brinton estimates that over time, if even just eight of the 33 designs listed in the report make it to market, their life cycle demand for spent nuclear fuel could add up to as much as 25% of the current US inventory. A few designs propose to use thorium as a fuel. Another feature is that coolants run the gamut including liquid metal, high temperature gases, and molten salt.

Here's a brief run down of some of the firms profiled in the Third Way report by type. Readers will note there is overlap among the types. This is the classification used in the Third Way report. The report also discusses work on fusion reactors and nuclear batteries, but those projects are not addressed here.

## Reactor Types by Design Approach

- Molten salt, some thorium fueled
- Liquid metal cooled, some SMRs
- High temperature gas (HTGR)
- Pebble bed (HTGR)
- Small modular reactor (LWR)

While the Third Way report does not attempt to pick winners or losers among the 33 designs, Brinton said eight of the advanced designs, as distinct from LWR type SMRs, are more likely to make it to market sooner rather than later. Brinton didn't put a time line on any of the designs on his informal short list which isn't part of the official report.

## Reactors with Prospects for Shorter Time to Market

~ Less than 300 MW

- [Terrestrial Energy](#), Mississauga, Ontario, CA; Molten salt

- [Advanced Reactor Concepts](#), Reston, VA; Liquid cooled metal
- [Gen4 Energy](#), Denver, CO; Liquid cooled metal
- [General Atomics](#), San Diego, CA; High temperature gas

~ 300 MW or More

- [Terrapower](#), Bellevue, WA; Liquid cooled metal
- [Transatomic Power](#) of Cambridge, MA; molten salt
- [Areva HTGR](#), Charlotte, NC; High temperature gas cooled
- [General Electric/Hitachi](#), Wilmington, NC; Liquid cooled metal

### Directory of North American Advanced Reactor Projects

The directory lists most of the advanced reactor projects in the Third Way report except for nuclear battery, fusion, and fuel development efforts. Please send email to [djysrv@gmail.com](mailto:djysrv@gmail.com) about any other reactor projects not list here.

#### North American Advanced Reactor Projects

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This list is based on a June 2015 report by the Third Way think tank in Washington, DC. Samuel Brinton is the lead author. Reactors are grouped by basic design types.

#### Non-LWR Technologies

Company	Transatomic
Reactor Type	Molten salt
Company Location	Cambridge, MA
Recent Media	<a href="http://www.transatomicpower.com/press/">http://www.transatomicpower.com/press/</a>
Company	Terrestrial Energy
Reactor Type	Molten salt
Company Location	Mississauga, Ontario, Canada
Recent Media	<a href="http://terrestrialenergy.com/media/media-coverage/">http://terrestrialenergy.com/media/media-coverage/</a>
Company	Martingale Inc (Thorcon)
Reactor Type	Molten salt
Company Location	Stuart, FL
Recent Media	<a href="http://thorconpower.com/library/presentations">http://thorconpower.com/library/presentations</a>
Company	Flibe Energy
Reactor Type	Liquid-fluoride thorium reactor (LFTR)

Company Location Huntsville, AL  
Recent Media [http://flibe-energy.com/?page\\_id=20](http://flibe-energy.com/?page_id=20)

Company Oak Ridge National Laboratory (SmATHR)  
Reactor Type Fluoride-Salt-Cooled High-Temperature Reactor  
Company Location Oak Ridge, TN  
Recent Media [Short URL](#)

Company Massachusetts Institute of Technology (FHR)  
Reactor Type Fluoride-Salt-Cooled High-Temperature  
Company Location Cambridge, MA  
Recent Media [Short URL](#)

Company University of California Berkeley (PB-FHR)  
Reactor Type Fluoride-Salt-Cooled High-Temperature  
Company Location Berkeley, CA  
Recent Media [Short URL](#)

Company General Electric-Hitachi (PRISM)  
Reactor Type Sodium-cooled fast reactor  
Company Location Wilmington, NC  
Recent Media <http://gehitachiprism.com/news-media/>

Company Advanced Reactor Concepts  
Reactor Type Sodium-cooled fast reactor  
Company Location Reston, VA  
Recent Media <http://www.arcnuclear.com/white-papers>

Company Thorenco  
Reactor Type Liquid Fluoride Thorium Reactor  
Company Location San Francisco, CA  
Recent Media [Short URL](#)

Company Argonne National Laboratory (STAR)  
Reactor Type Lead cooled small modular fast reactor  
Company Location Lemont, IL (Chicago region)  
Recent Media <http://www.ne.anl.gov/research/ardt/hlmr/>

Company LakeChime (L-ESSTAR)  
Reactor Type Lead cooled small modular fast reactor  
Company Location Williamsburg, VA  
Recent Media [Short URL](#)

Company Gen4 Energy (G4M)  
Reactor Type Liquid metal cooled fast reactor  
Company Location Denver, CO  
Recent Media [Short URL](#)

Company Virginia Tech ADNA Corp (GEMSTAR)  
Reactor Type Accelerator driven molten salt  
Company Location Blacksburg, VA  
Recent Media [Short URL](#)

Company Univ Calif Berkeley (ENHS)  
Reactor Type Lead cooled small modular fast reactor  
Company Location Berkeley, CA  
Recent Media [Short URL](#)

Company [TerraPower](#)  
Reactor Type Sodium cooled fast reactor  
Company Location Bellvue, WA  
Recent Media <http://terrapower.com/news>

Company StarCore Nuclear  
Reactor Type High Temperature Gas Cooled Reactor (HTGR)  
Company Location Montreal, Quebec, Canada  
Recent Media [Short URL](#)

Company General Atomics – Energy Multiplier Module  
Reactor Type High Temperature Gas Cooled Reactor (HTGR)  
Company Location san Diego, CA  
Recent Media <http://www.ga.com/energy-multiplier-module>

Company US Department of Energy  
Reactor Type Advanced Nuclear Reactor R&D  
Company Location Germantown, MD

Recent Media [Short URL](#)

Company Hybrid Power Technologies  
Reactor Type Helium-cooled, graphite moderated reactor  
Company Location Kansas City, KS  
Recent Media <http://www.hybridpowertechnologies.com/>

Company X-Energy  
Reactor Type High Temperature Gas Cooled Reactor (HTGR)  
Company Location Greenbelt, MD  
Recent Media <http://www.x-energy.com/#!/news/c19kb>

Company Northern Nuclear (Leadir-PS100)  
Reactor Type Lead cooled SMR  
Company Location Cambridge, Ontario, Canada  
Recent Media [Short URL](#)

Company Areva HTGR  
Reactor Type High Temperature Gas Cooled  
Company Location Charlotte, NC  
Recent Media [Short URL](#) & [NGNP web page](#)  
**Small Modular Reactors – LWR**

Company B&W, Bechtel, mPower  
Reactor Type LWR SMR  
Company Location Charlotte, NC  
Recent Media [Short URL](#)

Company NuScale  
Reactor Type LWR SMR  
Company Location Corvallis, OR  
Recent Media <http://newsroom.nuscalepower.com/>

Company Holtec  
Reactor Type LWR SMR  
Company Location Jupiter, FL  
Recent Media <http://smrllc.com/news/>

Company Westinghouse

Reactor Type	LWR SMR
Company Location	Pittsburgh, PA
Recent Media	<a href="#">Short URL</a>