




Climate Needs Nuclear

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Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/Distribution/generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "[Smart Grid Redefined: Transformation of the Electric Utility](#)" and "[Electric System Operations – Evolving to the Modern Grid, 2nd Edition](#)", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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If climate change mitigation is to be the foremost goal of the 21st century, then a crucial electric power question is emerging. Can substantial and maintainable carbon reduction be achieved without a revival of nuclear power?

How critical is nuclear power to the grid's future? What steps are needed to insure that nuclear power is a viable future energy resource?

Setting the Context:

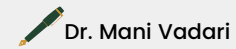
The electric power industry is entering a very uncertain phase from a generation-profile perspective – at least in the U.S. Coal power plants are being retired at rates almost similar to the ones that were seen from a commissioning perspective in the 60s and 70s. Natural gas is at its lowest prices in history leading to an unprecedented rate of new gas-powered plants coming into play all over the U.S. In addition, renewable power is coming into play and between wind and solar brings its own levels of complexity into the power generation equation.

None of this is intended to paint a dire view of future generation. The good news in the midst of all this is the new announcement about the First U.S. Small Modular Nuclear Reactor which cannot be ignored. According to Modern Grid Solutions' State of the Grid Briefing (adapted from EnergyBiz):

"The process of building the first U.S. small modular reactor generation units nudged forward this summer. The Utah Associated Municipal Power Systems (UAMPS) and NuScale Power notified of their plans to submit a design certification application by the end of 2016. This will be followed by a combined construction and operation license application by early 2018. If built, the plant would provide 600 MW of baseload capacity, produced by a dozen 50 MW SMRs fabricated by NuScale and its primary investor, Fluor. It would be operated by Energy Northwest on behalf of UAMPS, and possibly additional utility partners. If the project successfully navigates the regulatory and economic hurdles, it could begin producing power by 2023. An early leading candidate installation site is the Idaho National Laboratory complex."

In the backdrop of this news release, today's discussion on nuclear power is very timely.

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So, what does this mean for nuclear power?

Even though natural gas is slowly moving into a dominant position in the power generation hierarchy, it is important to note that it is NOT a clean alternative to coal. While it is not as dirty as coal in its emissions of greenhouse gases, it is not completely clean. Nuclear power can be!!

Nuclear power has received a very bad reputation and not all of it is wrongfully attributed. While the world still has the nightmares of Three Mile Island, Chernobyl to name the most infamous of them all, it is also noteworthy to note that much of the world's nuclear power plants have been working well and (more importantly) safely over the last 50 to 60 years. France's experiences present good testimony to this.

With the alarming news on climate change such as the recent floods in Chennai, India, and the increasing rate of storms in the U.S., it is important for the U.S. to show the leadership and the entire world to follow quickly by making serious moves to combat climate change. This means that slowly and steadily, we must reduce and then eliminate all sources of GHG. This means that low prices or not – over time, even gas-powered generation must go.

So what will it get replaced by – renewable sources of energy are not it. Perhaps, Nuclear power deserves another serious look.

What needs to happen for nuclear to get a key role in this portfolio?

This is a multi-faceted problem, one that requires deep analysis and resolution by all stakeholders.

- The nuclear industry must be able to develop alternatives to the huge nuclear power plants of the past – ones that are smaller, safer, and more controllable.*
- The government must work with the nuclear industry and the citizenry at large to ensure that regulations are in place to make the permitting process stringent but common sense. Making it too arduous will deter the industry from making real progress.*
- The general public cannot just expect renewables to provide all the answers; the portfolio needs to be balanced and be able to provide alternatives that support the need to delay/avoid global warming but also allow the electric utilities tools and mechanisms to deliver reliable power that is necessary for modern economies.*