

The US Ambitious Plan to Triple Nuclear Power by 2050

As COP 29 got underway in Baku, Azerbaijan, expanding nuclear power continued to be high on the agenda. The Government Pledge to triple global nuclear signed at last year's COP 28 in Dubai added six new signatories this year, El Salvador, Kazakhstan, Kenya, Kosovo, Nigeria, and Türkiye, bring the total number to 31.

We have previously spoken about the plans of countries such as the UK, Canada, and France to meet this target. Today, we will talk about the largest nuclear country of all, the United States and its recently issued action plan to triple its nuclear fleet, an addition of 200 GW of nuclear by 2050.



Source: iStockPhoto.com

This is not the first we hear of this ambition. The US Department of Energy issued its “Liftoff report” in 2023

setting 200 GW as the goal by 2050. More recently in September 2024, it updated this report with more details and analysis of the issues. And now in November, the White House issued its plan "SAFELY AND RESPONSIBLY EXPANDING U.S. NUCLEAR ENERGY: DEPLOYMENT TARGETS AND A FRAMEWORK FOR ACTION".

This plan sets out a timeline and the policies in place to support deployment. It talks about needing large nuclear, SMRs, microreactors and even restarting currently idled plants. An all-of-the-above strategy. In terms of timing, it sets a target of 35 GW of new nuclear to be in operation or under construction by 2035, with annual nuclear deployment growing to 15 GW per year by 2040 and thereafter.

This is massive in scope. For context, the large nuclear is assumed to be the AP1000 at about 1200 MW per unit, the SMRs include designs in the 300 MW range like those from TerraPower and GEH and the small more modular designs around 100 MW per unit such as those from NuScale and X-Energy. In terms of numbers, if we assume about half of the demand will be met with large units, this would require a fleet of 14 or 15 AP1000s to be committed almost immediately in order to be under construction with the first units completed by 2035. If we then assume a quarter are 300 MW class that means another 20 or so TerraPower and GEH type units by 2035 and the remaining ones in the 100 MW range would require about 60 or so NuScale and X-Energy type modules, all within a decade. Wow! These numbers are presented to show the scale and can move up and down based on how many of each type of reactor are deployed. (Note: we do not count any microreactors as their very small size means they would need hundreds to make a dent in the target – so we left them out to make the point. Of course, they are also likely to be deployed.) Of these designs, there are now 2 completed and operating AP1000s at Plant Vogtle. And each of the GEH (in Canada), TerraPower (Wyoming) and X-Energy (Dow in Texas) SMR designs are working on their First of a Kind (FOAK) projects to be completed

around the end of the decade.

This would just be the beginning. The above shows the path to the first 35GW of new nuclear by 2035. This would have to keep scaling adding another 5 to 6 times as much in the subsequent 15 years to 2050.

So, yes, this is a massive challenge for the US industry. Even with the interest and recent commitment of the tech industry to nuclear; and with all the incentives and programs underway, traditional nuclear utilities still remain hesitant to start new projects due to concerns about delivery risk that need to be overcome (which we believe they will).

The need to scale the US industry is dramatic. There is a need for focus and immediate action. Large nuclear is a necessity to achieve this goal. Therefore, there can be nothing more important than to secure an order book for the first 10 or more units in a renewed US fleet of AP1000s. Possible? Yes, but a huge challenge. And then imagine the effort required to both meet domestic US needs and to support an expanding export market.

We don't know what may change in this plan as the new US administration comes into power in the new year. Not being American, we are not going to speculate and invite those of you with more knowledge to contribute your thoughts in the comments. In any case, this plan is bold and there are many policies in place to support it. Now, the most important thing – getting started

[Note: we apologize for not posting anything over the last few months as we took a bit of break from the blog as we were focused on other work. Hopefully we are now back at it and will do our best to keep new posts coming.]