

Research @ Citi Episode 67: Megawatts & Megatrends — Nuclear's Second Act

Recorded: Feb. 19, 2026

Published: Feb. 26, 2026

Host: Robert Rowe, U.S. Regional Director of Research, Citi

Guest: Vikram Bagri, U.S. Alternative & Renewable Energy, Citi

Transcript:

Robert Rowe (00:02)

Hi, everyone. I'm Rob Rowe, U.S. Regional Director of Research. Welcome to our podcast, Research @ Citi. With me on the podcast today is Vikram Bagri, who is our senior analyst in charge of oversight of renewables. And the topic today is an exciting one, on nuclear energy.

And clearly, nuclear energy has been in focus for the last couple of years. And I think what has been of concern of late — not just of late, probably over the course of the year, but it's building focus — is concerns about the power grid, given the large demand that we're beginning to see in terms of the proliferation of data centers or EVs, and I would think in the future robotics.

But in any case, the country and the world needs a lot more electricity and the power grid may be challenged. And maybe nuclear energy is one economic source of that.

Vikram, thanks for being on the podcast with us.

Vikram Bagri (00:53)

Thanks for having me.

Robert Rowe (00:55)

Fantastic. Maybe we could start off here today where you give us a state of play in terms of nuclear energy. I know that in respect to nuclear energy, the one caveat is that it may not come online quick enough. Where are we in terms of nuclear energy right now?

Vikram Bagri (01:14)

I think in nuclear space, all the building blocks of making nuclear successful are in place. We have an unprecedented policy support in favor of nuclear. I've said this multiple times, that virtually the only topic on which Republicans and Democrats have agreed in the last few years is nuclear.

That unprecedented policy support has also resulted in unprecedented capital support for nuclear. We have seen billions of dollars being raised by public companies: by some estimates, over \$3 to \$4 billion of venture capital being raised last year in nuclear space. So very, very strong capital support.

And third, the demand is undeniably very high for nuclear solution.

One, it's a scalable solution that provides promise of unlimited power that can be installed quickly after a certain point.

And then two, it's clean energy that is preferred by hyperscalers, that is preferred by the community and the government. And that leads to all the building blocks: the full policy support, the full capital support to put nuclear in a place where it shows a lot of promise to be successful in a few years.

The final building block is the technology. There are about 130 nuclear technologies being researched in various stages of deployment across the world. Of those 100 technologies, about 45 are in the U.S. So a lot of different technologies. We are not researching on just one or two — there's a lot of capital flowing in, there's a lot of policy support.

The policy support has certainly accelerated the nuclear research and adoption. There are a few things that have accelerated that. The ADVANCE Act that passed last year accelerated the licensing process through NRC for nuclear reactors. A licensing which used to take more than three to five years, now NRC is mandated to review these applications within 18 months. The cost of application at NRC has been lowered by the same ADVANCE Act, and NRC is putting more resources in place to review these applications. So, certainly acceleration of a review of applications at the government level.

The second piece that is accelerating the adoption is there is another pathway which has emerged. The Department of Energy has selected about 10 different nuclear-reactor companies to develop nuclear reactors on Department of Energy sites, where Department of Energy will also facilitate private funding and provide a fast-track pathway to install these reactors.

These reactors will be able to get the permits from Department of Energy and sidestep NRC in that process. The plan is to have a few reactors reach criticality by July 4th of this year under that Department of Energy pathway. So it's an even more accelerated process than the NRC. So we're seeing unprecedented capital support, unprecedented policy support, and the brightest minds researching on a wide range of technologies which makes nuclear a highly likely solution in the long term that will support the power demand growth in the U.S. and abroad.

Robert Rowe (04:27)

And Vikram, when you said “criticality,” what do you mean by that?

Vikram Bagri (04:32)

Sure, Rob. In simple terms, a reactor is considered to have reached criticality when the reactor core has been installed and it has achieved a sustained chain reaction in a safe way, with emphasis on “safe way.”

It means the reactor is not subcritical or supercritical, which in turn means it doesn't die out or the energy perpetually increases when it becomes unstable. Criticality also lets the operator test a number of things before putting the reactor into operation. This includes testing the control rods, temperatures, shutdown margins, cooling infrastructure, and so forth. But the exact definition of criticality can vary based on project to project.

It is also worth noting, Rob, that the July 4th deadline is for three reactors to reach criticality, and does not define what reactors. These can be power-generating reactors, or there is another category, which is radioisotope reactors.

As you know, radioisotopes have a wide range of applications, including medicines, testing, pest control, cancer treatment and such. These substances, radioisotopes, are some of the most expensive substances on earth. So they're very much in demand and they offer very attractive margins to producers.

So in conclusion, the criticality before July 4th, as per the president's directive, could also be for radioisotope reactors that may not solve the power demand needs, but will help with other important applications. It's also important to note, criticality does not mean the reactor is ready to be turned on for power either.

Robert Rowe (06:10)

Got it. And in terms of economics, I mean, first off, after post-criticality, which I guess for the DOE would be July 4th, or whatever date, after that, how long would it be till you would have nuclear power up and running? Is it a number of years, or has the technology improved such that this could happen faster?

Vikram Bagri (06:29)

Sure. We think that it's a very aggressive timeline. So it remains to be seen if we'll have reactors reaching criticality by July 4th. And once you have reactors fully installed and producing power, it will likely take a year or two after that. But the power from these reactors cannot be sold commercially because they were installed without a permit from the Nuclear Regulatory Commission, the NRC.

So the power can only be sold to Department of Energy and Department of Energy divisions, but not commercially to either retail customers or hyperscalers. To convert that reactor into a reactor that sells power commercially, these reactor companies will have to reapply for a license with the NRC, go through that timeline — 18-month timeline — get licensed from the NRC, and then sell power commercially.

So it is going to be a long process. We think nuclear reactors in a small modular reactor space will start coming online in a meaningful way in early 2030s.

Robert Rowe (07:32)

The early 2030s.

Can you give us a sense economically about how much power would be coming on? How much power is needed, in your estimation? You know, maybe we can just focus on the U.S. for now, but how much power is really going to be required, or estimated to be required? And what's the shortage, and how much can nuclear power contribute over time?

Vikram Bagri (07:51)

Sure. As you know, Rob, we are forecasting that historically, U.S. power demand has increased by only 50 basis points over the last 10 years. We're forecasting our power demand increases by around three percentage-point giga over the next 15 years.

The role nuclear plays in that, based on our estimates, supply and demand balance, is about five to six gigawatts of power will be supplied by nuclear starting 2032. And this power is being added largely by small modular reactors.

In terms of economics, the big promise of nuclear is the upfront capital cost of nuclear currently is pretty high, but the space has a very high learning rate as well. So the cost of the first reactor vs. 10th reactor and so forth — what we call the first-of-a-kind reactor vs. nth-of-a-kind reactor — the cost decline is 40 to 50 percent.

Currently, the Energy Information Administration estimates that it takes about \$10,000 per kilowatt for upfront capital costs of a nuclear reactor. This compares to a CCGT cost of about \$2,400. But when you bake in the ITC incentives attached to nuclear, and you bake in the learning rate that the cost could reduce by 40 to 50 percent, the upfront capital cost of some of these nuclear reactors is projected to decline to about \$3,000 per kilowatt.

And that is very attractive. It's especially attractive given that CCGT requires constant supply of fuel in the form of natural gas. But for nuclear reactors, the fuel in some of these reactors will last five to six years. So the upfront capital cost also includes the cost of fuel for next five years, uptime of over 90%, capability to change the peak power of these nuclear reactors for short duration if there is a spike in power demand, and clean power.

So it's going to be economical, it's going to be clean, and it's going to be very price-competitive with CCGT.

Robert Rowe (09:59)

Wow. And CCGT, just for the audience?

Vikram Bagri (10:02)

Combined Cycle Gas plants.

Robert Rowe (10:04)

OK, great. Thank you.

And one issue I was thinking about is the fact that there is going to be private ownership of nuclear power, as well as public ownership of nuclear power, right? As you pointed out, the Department of Energy will have a lot of capacity that they will own, but also hyperscalers are exploring this with SMRs.

So maybe you could comment a little bit about the implications of that, being that nuclear power used to be a very highly regulated energy source, for obvious reasons. Now you have private ownership of these, and maybe you can also talk about the SMR technologies and what the potential advantages or disadvantages are there.

Vikram Bagri (10:42)

For sure. SMRs, as you know Rob, are in early stages of development. There are two SMRs operating around the world. There are four to five SMRs being developed around the world. So we are in very, very early stages of understanding the technology and developing it.

A lot of these reactors, I should mention, have operated for a number of decades in controlled situations in a lab, whether it's a Department of Energy lab in the U.S. or university labs outside the U.S., in China and Russia. So it has been demonstrated at a smaller scale. Now we are trying to replicate the design at a much larger scale, but we are in early stages.

In terms of development of technology, hyperscalers are counting on this technology because it's rapidly deployable and it frees them from the burden of getting an interconnection from the grid, which is burdened already by a lot of power demand, and the grid infrastructure in the U.S. is old as well.

We have seen a number of agreements from hyperscalers directly with nuclear technology companies, small modular space. I think at this point, pretty much all the hyperscalers, except a few, have a nuclear technology partner in the form of a small-modular-reactor company. So they are investing in these companies as a call option that if and when this technology is successful, they can rapidly deploy to scale up their AI ambitions.

In terms of regulation, even if the technology is grid-independent — is installed behind the meter, without a connection to the grid — it will be regulated by the NRC. The license from the NRC will be required and the NRC will be the governing body which will oversee the operations of these nuclear reactors.

From a safety standpoint, these reactors are not going to be very different than reactors that are serving retail customers. The reactors that do not fall under the purview of NRC are the reactors being developed by Department of Energy, but they will not produce commercial electricity until they have a license from NRC.

So what the government has done is they've created this much accelerated, faster pathway to Department of Energy to test these designs. And once they are theoretically tested in real-world conditions at a scale, hopefully the NRC applications will be a little more straightforward.

Robert Rowe (13:10)

Got it.

And this argument about being off the grid, is that something that the government is OK with? Would there ever be a situation where the public doesn't have the power but the hyperscaler next door does? And would the hyperscaler next door at some point be obliged to help out the power grid if it was getting too costly?

Vikram Bagri (13:31)

Yeah, that's a great question, Rob. There is a lot of back and forth, whether you could install your own power sources and be grid-independent.

The argument against that is that the cost of the grid is being paid by all the consumers who are not on the grid, and you are installing your own power source and not betting the cost of the grid.

At the same time, the biggest argument is affordability in the U.S. These reactors have a long history of being in a meaningful way over budget. It takes a long time. Some of these projects, we spent billions of dollars of capital and never saw the light of the day. And that capex is paid for by the customers in the service area.

So there's both a fear of taking on these large projects and a fear of hyperscalers installing these projects and sidestepping the grid and not paying their fair share of the cost of the grid itself. I think the middle ground to a certain extent in the near term is hyperscalers pay the higher or additional cost of these reactors, and not burden the consumers in the jurisdiction by the cost of these reactors — what we call “bring your own generation,” to a certain extent.

In some cases, utilities and power producers in the U.S. are asking for nuclear-technology companies and hyperscalers to bridge the gap between the ability for these utilities to pay for power and the LCOE — Levelized Cost of Energy — of these nuclear reactors, which is much higher. So hyperscalers step in and take the burden of the extra cost of these nuclear reactors to facilitate the construction.

So I think the solution will be a hybrid of all three approaches. We'll see some behind-the-meter, grid-independent power sources. We will see a partnership between hyperscalers and utilities to insulate consumers from the higher cost of reactors — you know, find a middle ground on that.

Robert Rowe (15:29)

Right. And competitively, Vikram, I think in a prior discussion that we had, you mentioned China is well advanced along the way here. How would you compare it to the U.S. or Europe in terms of where they are in their progress on nuclear?

Vikram Bagri (15:43)

I think one of the key differentiating factors for China is they're vertically integrated, they control the entire value chain. For instance, in solar, they have 80% of the world's polysilicon production capacity. They have the largest solar-panel-production capacity, largest inverter-production capacity. And by virtue of that, they have been miles ahead of anyone else in the world installing solar. They have achieved their 2030 solar-install target six years early.

It's somewhat similar to that in nuclear space. China has a pretty large nuclear-enrichment capacity through their state-owned nuclear-enrichment company. And there are only four nuclear-enrichment companies across the world, all four being state-owned: one in Russia, one in China, one is French, and one is a consortium of Germany, Netherlands, and UK.

So certainly they have a very large fuel-enrichment capacity. In addition to that, they are somewhat ahead in terms of installing small modular reactors. There's one operating, there are two being constructed as we speak currently. So again, like in terms of installation, in terms of supply chain, they certainly seem to be ahead. And the larger reactors that China has installed, they've installed at a much faster timeline than historically the U.S. has.

So they have somewhat better understanding of the technology. They have fine-tuned the way to install these reactors over time. So in those terms, they are ahead. But I would remind you that U.S. was the largest producer of enriched fuel and the only producer of enriched fuel before 1985, when we dismantled our fuel-enrichment capabilities. And U.S. has selected three companies and allocated \$900 million each, through a Department of Energy program recently, to rebuild nuclear-enrichment capabilities in the U.S. So we have pressed the pedal on rebuilding the nuclear-fuel supply chain into the U.S., and we're making progress on that front.

Robert Rowe (17:51)

Fantastic. Vikram, thanks so much for joining us today. This is a very insightful topic and one that's really top of mind for a lot of our investors. And hopefully we'll have you back again to give us a further update. Thanks so much.

Vikram Bagri (18:03)

Glad to be here. Thanks, Rob.

Robert Rowe (18:04)

This podcast was recorded on Feb. 19, 2026. Be sure to join us for our next Research @ Citi podcast, which will feature Filippo Falorni, the Citi U.S. Beverages, Household Products and Personal Care analyst, who will provide an analysis of the effects of the pill version of the GLP-1 drug on the consumer segment.

In the meantime, feel free to explore our previous podcasts, all of which are available on this channel and other channels as well.

And be sure to be on the lookout for our weekly Research @ Citi Markets Edition podcast with its 10-minute breakdown of the equity and global macro markets, each and every week. You can find that series on your favorite podcast channel.

Thanks so much, everyone.

Disclaimer (18:47)

This podcast contains thematic content and is not intended to be investment research, nor does it constitute financial, economic, legal, tax, or accounting advice. This podcast is provided for information purposes only and does not constitute an offer or solicitation to purchase or sell any financial instruments. The contents of this podcast are not based on your individual circumstances and should not be relied upon as an assessment of suitability for you of a particular product, security or transaction. The information in this podcast is based on generally available information, and although obtained from sources believed by Citi to be reliable, its accuracy and completeness are not guaranteed. Past performance is not a guarantee or indication of future results.

This podcast may not be copied or distributed, in whole or in part, without the express written consent of Citi. Copyright 2026, Citigroup Global Markets, Inc. Member SIPC. All rights reserved. Citi and Citi and Arc Design are trademarks and service marks of Citigroup, Inc. or its affiliates and are used and registered throughout the world.