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New Nuclear Reactors: The Wrong Resources for Colorado's Energy Transition

David Schlissel

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Initial Government and Industry Claims

- Atomic Power proponents in 1950s and early 1960s claimed that reactor construction costs would go down over time.
- Atomic Power “Too Cheap to Meter?”
- Didn’t happen.

The Nuclear Reality

- Reactors cost tripled and new reactors took twice as long to build as was claimed when construction started.
- High reactor costs led to “rate shock” for ratepayers when expensive new reactors were put into rates.
- Soaring costs also led to many reactor project cancellations.
- Only four reactors have started construction in U.S. since 2000. Two in SC were cancelled when estimated cost ballooned from $11 to $25 billion.
- Construction cost of the last two reactors completed in the U.S. was $22 billion(157%) higher than originally estimated and customers of Georgia Power Company are paying more than $150 per megawatt hour for the electricity from these reactors.

Current Government and Industry Claims

- But even after a 50-year history of rising reactor construction costs, with massive cost & extensive schedule overruns, nuclear proponents still claim:

1. New Small Modular Reactors (SMRs) will be built faster and at lower cost than existing reactors because they will use modular construction and build multiple copies of the same SMR designs.
2. Federal and state subsidies will make building new reactors less risky.

What's Wrong With Nuclear Supporter Claims That Future Reactors Will Be Built Faster and at Lower Cost

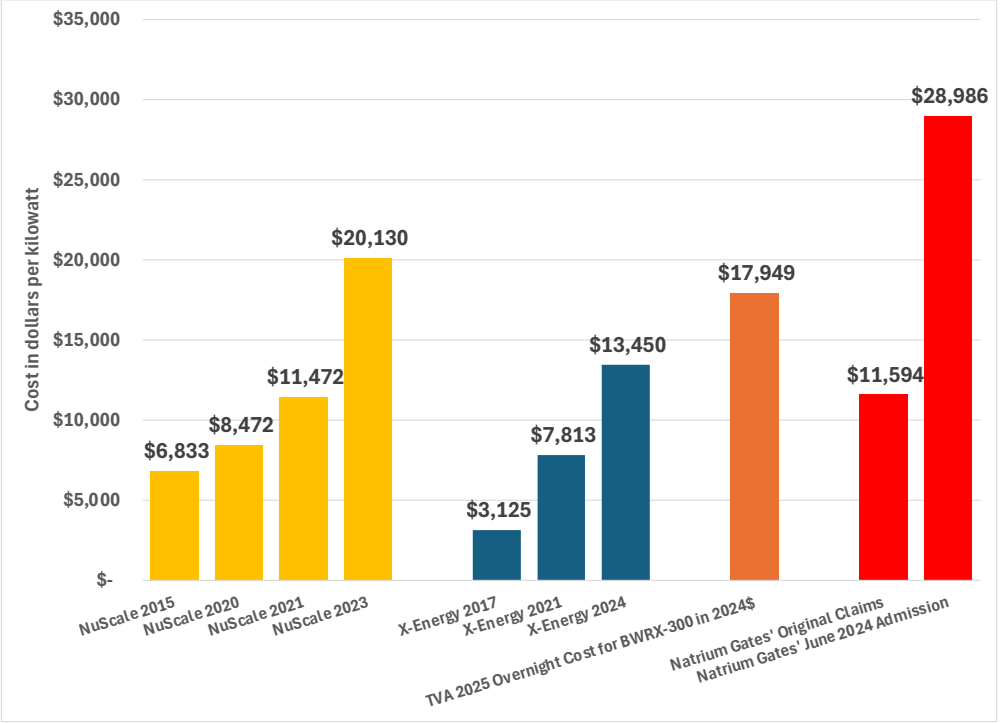
- There continue to be significant reactor risks and uncertainties.
- None of the SMR designs currently being marketed in the U.S. have been built anywhere. Only one SMR has started its non-nuclear construction.
- Estimated costs of leading SMR designs have already gone up dramatically years before construction is due to be started.
- There is no evidence that building multiple copies of SMRs or large reactors will lead to lower costs or faster construction.
- In fact, the only way supporters can show that future reactors will cost less is by ignoring key costs.
- Using modular construction failed to control the cost of the Vogtle reactors.

Estimated Costs for SMRs Have Already Gone Up Dramatically Years Before Construction Is Due To Begin

Estimated cost of NuScale's cancelled UAMPS SMR, on a dollar per kW basis, increased by 138% between 2020 and 2023.

Estimated cost of X-Energy SMR increased by 72% between 2021 and 2024.

Costs of building SMRs should be expected to continue to go up significantly in coming years.



Why Have Estimated SMR Construction Costs Gone Up By So Much in Such a Short Time?

- When in November 2023 NuScale cancelled what was going to be the first SMR built in the U.S. it cited two reasons
  1. rising estimated borrowing costs and
  2. skyrocketing construction commodity prices

For example, in just the two years prior to early 2023, the Producer Price Indices for key reactor construction commodities had increased significantly:

Fabricated Steel Pipe	54%
Carbon Steel Piping	106%
Electrical Equipment	25%
Fabricated Structural Steel	70%
Copper Wire & Cable	32%
All Construction Commodities	45%

Why Further Cost Increases Should Be Expected If Reactor Projects Go Ahead

1. Design uncertainties – none have been built.
2. Construction labor wage rates and the prices of some construction commodities have continued to go up.
3. Existing and potential tariffs on materials used in reactor construction.
4. Depending on how many new reactors start construction, increased competition for limited design, engineering and commodities would lead to higher construction costs.
5. No existing domestic U.S. reactor supply chain.

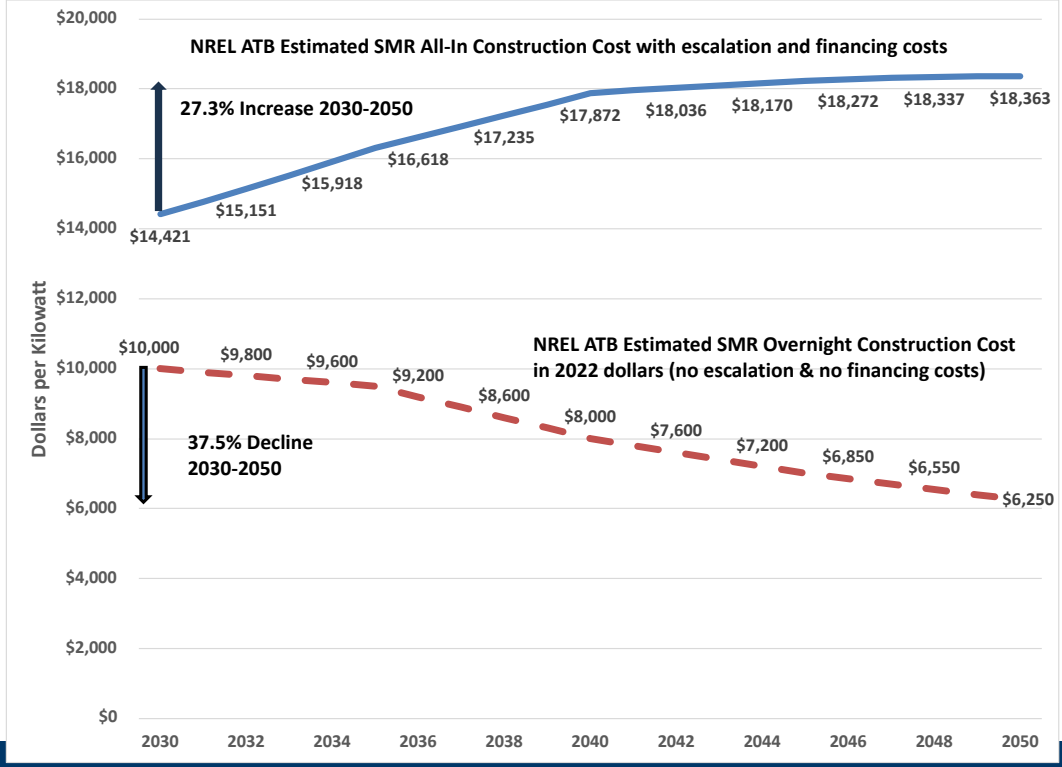
The Estimated Schedules for SMRs Already Have Been Delayed by Years

- NuScale originally told NRC that an SMR could be producing electricity by 2015-2016. By the time NuScale's first proposed SMR was cancelled in 2023, its commercial operation date had slipped to 2029-2030.
- The initial Xe-100 reactor was first planned to be online by 2027, but this too has been delayed. Now what is being called "substantial completion" is scheduled scheduled for September 2033.

Supporter Claims That Building Multiple Copies of the Same SMR Design Will Lead to Lower Costs Ignore Important Costs

SMR supporters focus on estimated 'overnight costs' which exclude escalation and financing costs. In other words, they assume reactor could be built "overnight" with no financing costs.

When 'All-In' costs are included, it is clear that nuclear construction costs will continue to go up, not down.



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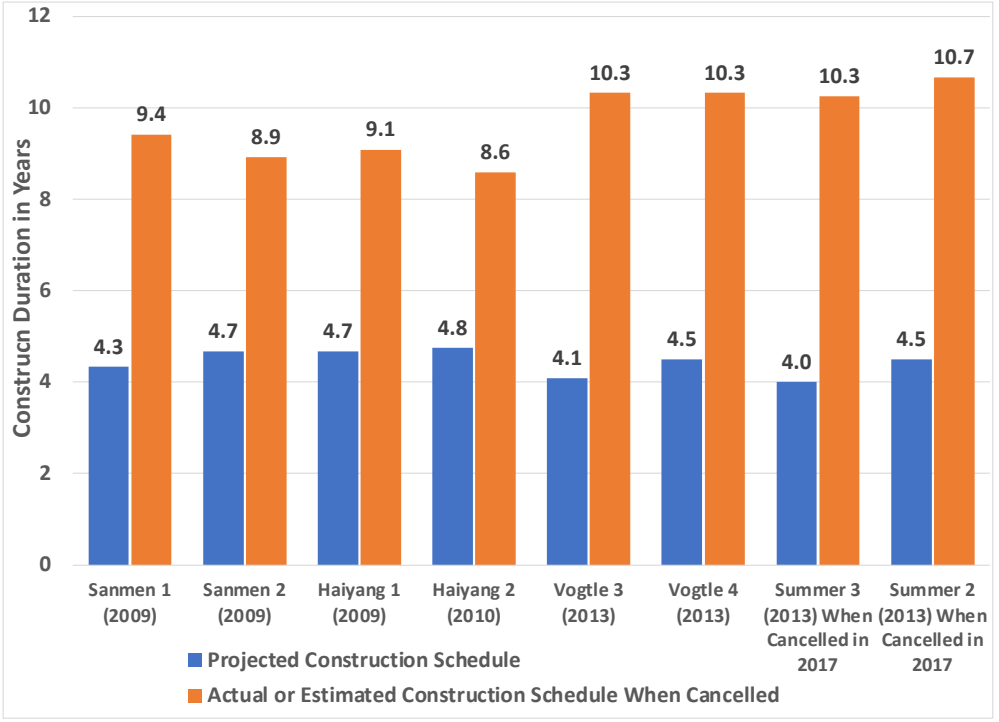
There's No Evidence That Building Multiple Copies of Same Reactor Design Will Lead to Faster Construction

The Westinghouse AP1000 was the reactor design built at the Vogtle Nuclear Project in Georgia and the U.S. government claims that ten more AP1000 reactors will be started by 2030.

But even though four AP1000 reactors started construction in China three or more years ahead of Vogtle, it took years longer to build the two the Vogtle Reactors.

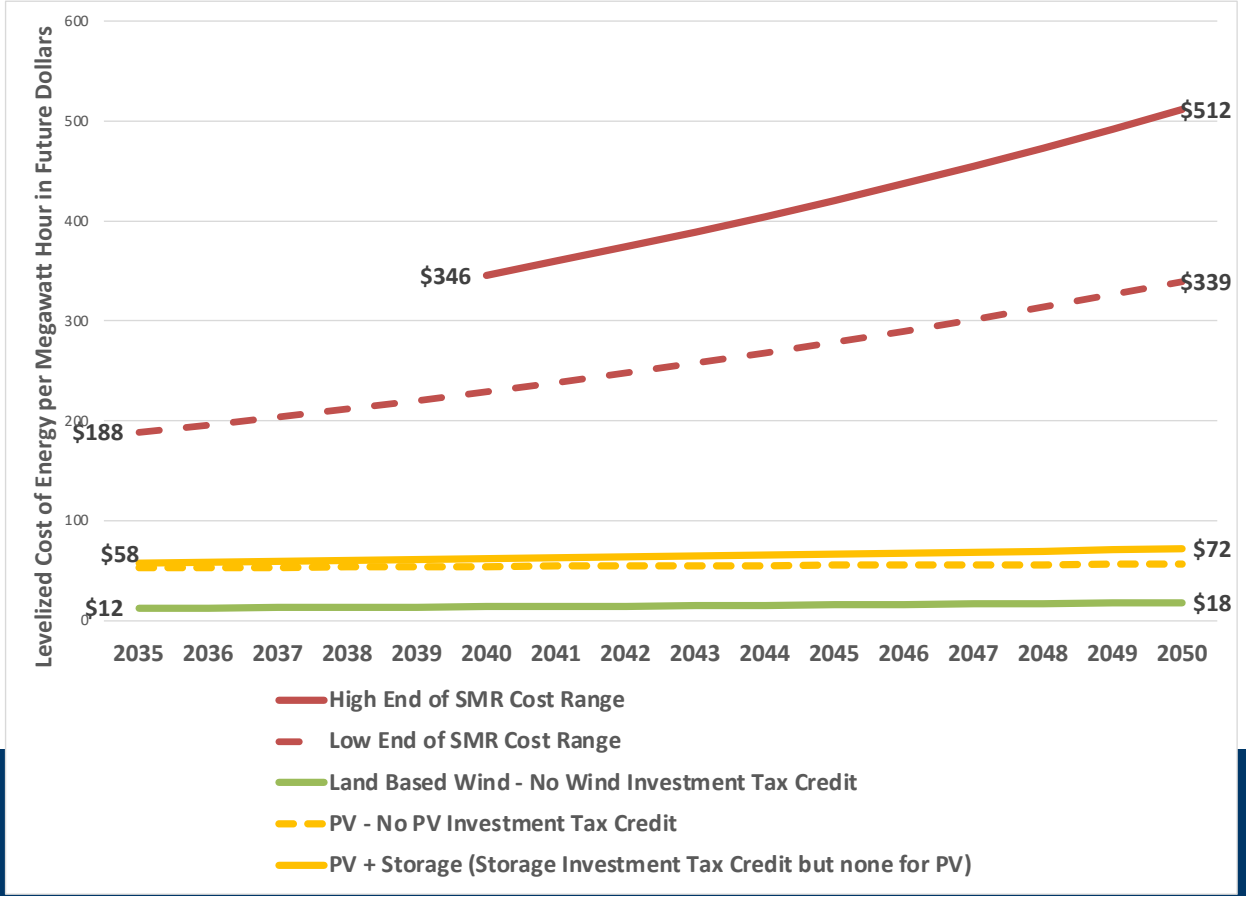
All of the AP1000 reactors built to date have taken at least four years longer to build than claimed at start of construction.



Even With A 50% Federal Nuclear Subsidy, The Power from SMRs Will Cost Far More Than From Renewables & Storage

Sources - Analysis of data and assumptions from NREL's 2024 Annual Technology Baseline, TVA's 2025 IRP, DOE's September 2024 Pathway to Commercial Liftoff: Advanced Nuclear, and the Handy-Whitman Index of Public Utility Construction Costs

[Schlissel Technical Consulting & the Institute for Energy Economics and Financial Analysis]



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Federal and State Nuclear Subsidies Will Not Save Ratepayers Any Money

- Federal subsidies just transfer the responsibility to pay reactor costs from ratepayers to taxpayers. These are the very same people. No savings there.
- Public Service of Colorado (PSCo) has asked the Public Utilities Commission (PUC) to spend up to $100 million of ratepayer provided funds to ”de-risk” investments in new technologies.
- But there’s no “de-risking” investments in reactors, like SMRs, that have never been built anywhere.
- The PUC should make PSCo, which stands to earn hundreds of millions to billions of dollars from ratepayers if it builds new reactors, spend its own money to try to de-risk investing in SMRs or large reactors billions.

For More Information

Contact

David@Schlissel-technical.com

Dwamsted@ieefa.org

Also see

April 2025 testimony of David Schlissel in Colorado Public Utilities Commission Proceeding No. 24A-0442E

And

Small Modular Reactors, Carbon Capture: The Wrong Resources for Colorado's Energy Transition