Nuclear Provided Majority of Emissions-Free Electricity

Nuclear generated 19% of electricity in the U.S.

From 93 reactors at 53 plant sites across the country

KEY

• Nuclear power reactor
Voices for Nuclear

“The United States views nuclear energy as a pivotal technology in the global effort to lower emissions, expand economic opportunity, and ultimately combat climate change. We have been supporting the development of SMRs for decades.”

Jennifer Granholm
Secretary
U.S. Department of Energy
November 4, 2021

Republicans have plans to reduce those emissions while investing in clean energy technology that will lead to less emissions, lower costs, and produce as much or more power. Chief among them is advanced nuclear technology.”

Rep. Kevin McCarthy
(R-CA)
February 26, 2020

“If we’re going to continue to move and talk about decarbonization and not going to move forward with nuclear we’re [going to have] serious problems.”

Sen. Joe Manchin
(D-W.V.)
June 4, 2020

Scan to see what everyone is saying about America’s largest clean energy source.
Consumer Benefit: Lowest System Cost Achieved by Enabling Large Scale New Nuclear Deployment

**Lowest Cost System**

- Nuclear is 43% of generation (>300 GW of new nuclear)
- Wind and solar are 50%

**Energy System with Nuclear Constrained**

- Wind and Solar are 77% of generation
- Nuclear is 13% (>60 GW of new nuclear)
- Increased cost to customers of $449 Billion

Both scenarios are successful in achieving 95% clean electricity grid by over 95% by 2050 and economy-wide GHG by over 60%

Source: Vibrant Clean Energy: [https://www.vibrantcleanenergy.com/media/reports/](https://www.vibrantcleanenergy.com/media/reports/)
## System Benefits of Advanced Reactors

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
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<tbody>
<tr>
<td>Long term price stability</td>
<td>• Low fuel and operating costs</td>
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<td>Reliable dispatchable generation</td>
<td>• 24/7, 365 days per year, years between refueling (Capacity factors &gt;92%)</td>
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<td>Integration with renewables and storage</td>
<td>• Paired with heat storage and able to quickly change power</td>
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<td>Efficient use of transmission</td>
<td>• Land utilization &lt;0.1 acre/TWh (Wind =1,125 acre/TWh; Solar 144 acre/TWh)</td>
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<tr>
<td>Environmentally friendly</td>
<td>• Clean energy</td>
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<td>• Many SMRs are being designed with ability for dry air cooling</td>
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<td>Black-start and operate independent from the grid</td>
<td>• Resilience for mission critical activities</td>
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<td>• Protect against natural phenomena, cyber threats and EMP</td>
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Source: SMR Start, *SMRs in Integrated Resource Planning*
Recent Survey of NEI’s U.S. Utilities

Nuclear power’s potential role in meeting their company’s decarbonization goals:

- **SLR**: >90% of fleet expects to operate to at least 80 years
- **GW**: 100 GW of new nuclear opportunity by 2050s
- **SMRs**: Translates to roughly 300 SMR-scale plants

NEI utility member companies produce nearly half of all US electricity.
Advanced Reactor Developers
Expanding Versatility through Advanced Technology

Micro Reactors (< 20MWe)
- Oklo (shown)
- Approximately a dozen in development

Light-Water SMRs (<300MWe)
- NuScale (shown)
- GEH BWRX-300
- Holtec SMR-160

High Temp Gas Reactors
- X-energy (shown)
  Several in development

Liquid Metal Reactors
- TerraPower Natrium™ (shown)
  Several in development

Molten Salt Reactors
- Terrestrial (shown)
  Several in development

Non-Water Cooled
- Most <300MWe, some as large as 1,000 MWe

Advanced Nuclear Versatility

Spectrum of Sizes and Options
- Micro (Few MW)
- Mini (10s of MW)
- Small (100s of MW)
- Large (1,000+ MW)

Variety of Outputs
- Electricity
- H₂ Hydrogen
- Process Heat

Multitude of Uses
- Homes
- Vehicles
- Businesses
- Aviation
- Rail
- Shipping
- Concrete
- Steel
- Factories
- Water
- Space
Strong Federal Support for Advanced Reactors

- DOE funding 12 different designs, >$5B over 7 years
- Infrastructure Bill
  - $2.5B funding for two demonstration projects
- Inflation Reduction Act
  - PTC: At least $30/MWh for 10 years
  - ITC: 30% of investment
  - Both can be monetized, include 10% bonus for siting in certain energy communities
  - Loan Guarantees – up to $40B in expanded authority
  - HALEU Fuel - $700M
- CHIPS Act
  - Financial assistance to States, Tribes, local governments and Universities
State Action for Advance Reactors

2022
• 19 States introduced bills
• 11 States passed legislation

2023
• 100+ bills introduced
Advanced Nuclear Deployment Plans
Projects in planning or under consideration in U.S. and Canada >20; Globally >30

State action or stakeholder interest in advanced reactors
- Planned or considered project
- Under construction

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