Future of Nuclear Power in the United States

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If All U.S. Reactors Retire After 60 Years of Operation

Year	Total U.S. Electric Demand (bkWh)	Nuclear Capacity (GW)	Nuclear Generation (bkWh)	Nuclear Fuel Share	New Generation Needed to Meet Fuel Share (GW)	
					20%	25%
2015	4,134.3	100.2	790.2	19.1%		
2020	4,351,3	104.0	820.0	18.8%	6.4	34.0
2025	4,513.2	104.0	820.0	18.2%	10.5	39.1
2030	4,691.2	100.0	788.0	16.8%	19.1	48.8
2035	4,860.4	72.4	570.4	11.7%	50.9	81.8
2040	5,055.5	57.5	453.2	9.0%	70.8	102.8

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2030	4,691.2	104.0	820.0	17.5%	15.0	44.7
2035	4,860.4	104.0	820.0	16.9%	19.3	50.1
2040	5,055.5	104.0	820.0	16.2%	24.2	56.3

The Long-Term Vision

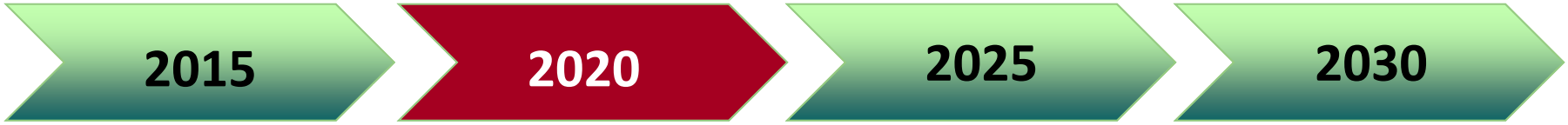
NEI Annual Plan: Supported by political and public acceptance of nuclear power, policies are in place to ensure nuclear energy provides at least 20 percent of U.S. electricity supply into the 2030s.

Large light water, small modular light water, and advanced reactor technologies should be pursued. All have a role in the future of nuclear power.

2015 | 2020 | 2025 | 2030

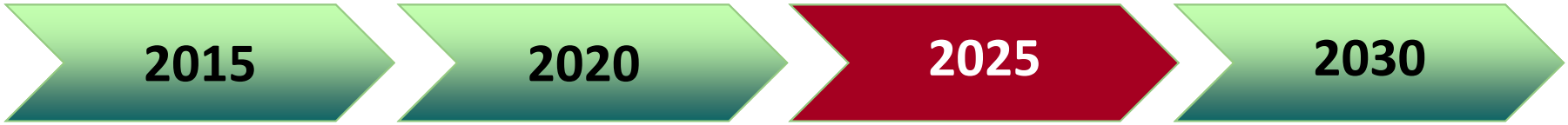
By 2020

- Vogtle 3 and 4, Summer 2 and 3, Watts Bar 2 in service successfully
- Certainty on small modular reactor commercial availability
- Design certifications for NuScale SMR
- Demonstrated regulatory framework for second license renewal



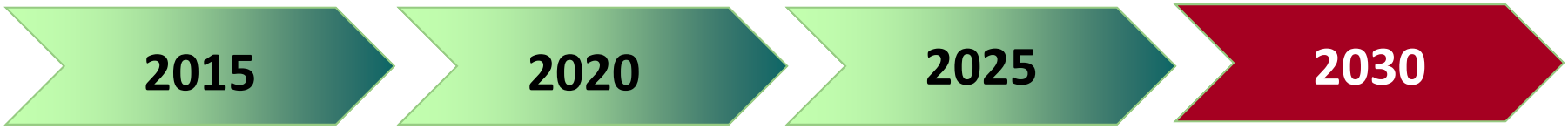
Early 2020s

- Decisions on whether or not to pursue license renewal for oldest plants (minimum 5 years out to qualify for timely license renewal)
- Begin construction of new nuclear generating capacity to (1) hold nuclear at 20%, or (2) replace nuclear capacity retiring at 60 years
- Complete FOAK engineering on SMRs; ready for deployment



In 2025

- 10.5 GW of new nuclear capacity on line to stay at 20% (very unlikely)
- Beginning of capex cycle necessary for plants going past 60 years



In 2030

- First reactors reach 60 years
- Approx. 31,000 MW of nuclear capacity reaches 60 years by 2035 (replacement cost ~$250 billion)
- EPA's 111(d) target: 32% reduction in carbon emissions
- Need 15-19 GW of new nuclear capacity on line to stay at 20% (12,500 MW now in active licensing)
- Only 23.5 GW (about 8%) of today's coal-fired capacity <25 years old
- Only 122 GW (about 28%) of today's gas-fired capacity <25 years old

Challenges/Opportunities

- Growth in electricity demand coupled with aging generation infrastructure
- Electricity markets
- Clean Power Plan
- Worldwide expansion of nuclear power
- New energy markets

Priorities

- Existing fleet
  - Market conditions - attributes of nuclear appropriately valued
  - Second license renewals
- SMRs – operational in the 2020s
  - NEI SMR Working Group
- Advanced reactors
  - NEI Advanced Reactor Working Group – utility interest

Advanced Reactor Designs

- Will they be able to operate for 40, 60, 80 years?
- Will they have a capacity factor comparable to existing LWRs?
- Can the construction be simplified and the cost reduced?
- Can the licensing process be simplified?

Advanced Reactor Development

- Significant private investment
- Environmental community interest – Clean Air Task Force
- Congressional interest
- DOE study on the need for a material test reactor and/or demonstration reactor
- Industry interest

Questions?

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