

Solutions to Meet our Net Zero

Targets:

Subsequent License Renewal (SLR) & Small Modular
Reactor(SMR)



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NUCLEAR PROCUREMENT ISSUES CORPORATION

“Our bridge to future energy needs”

NUPIC Vendors Conference

Paul Phelps

Director Nuclear Project Technical Support – SLR

paul.phelps@dominionenergy.com



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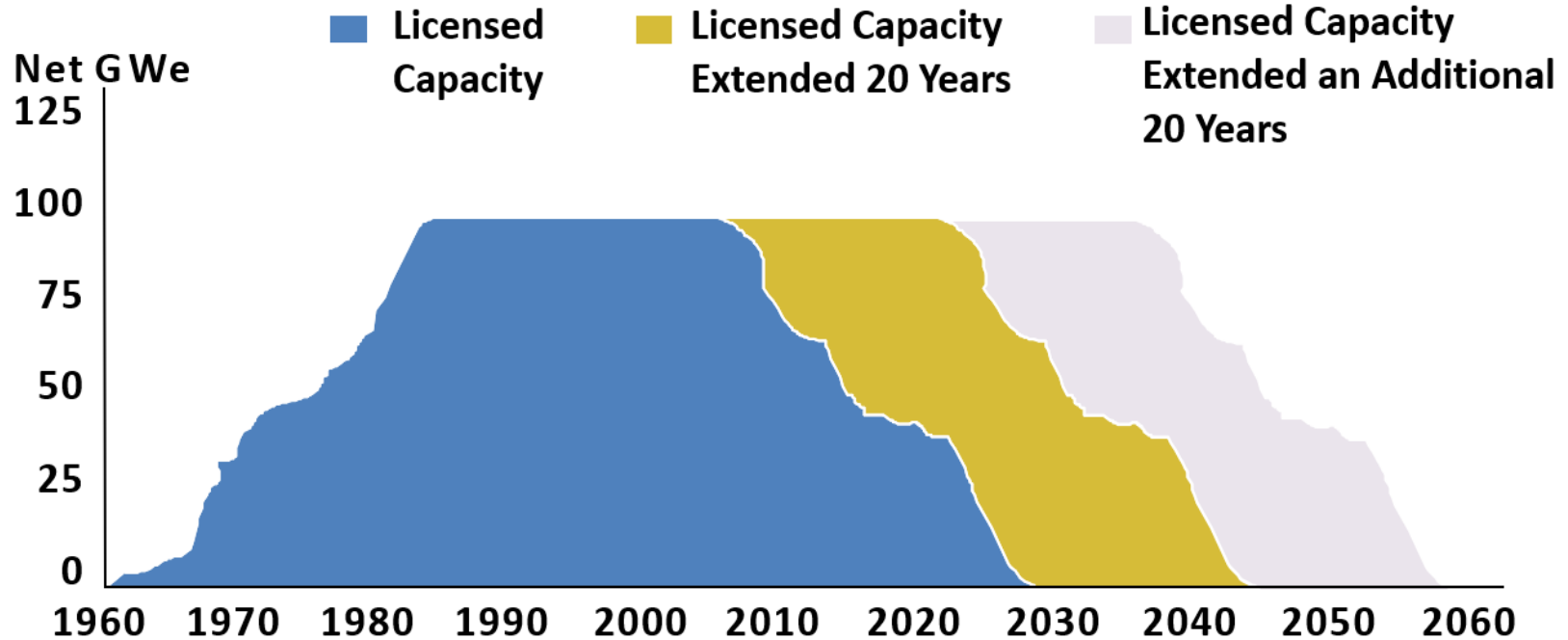


Industry Approach for Subsequent License Renewal (SLR) in U.S.

Environmental Benefits of Nuclear Power

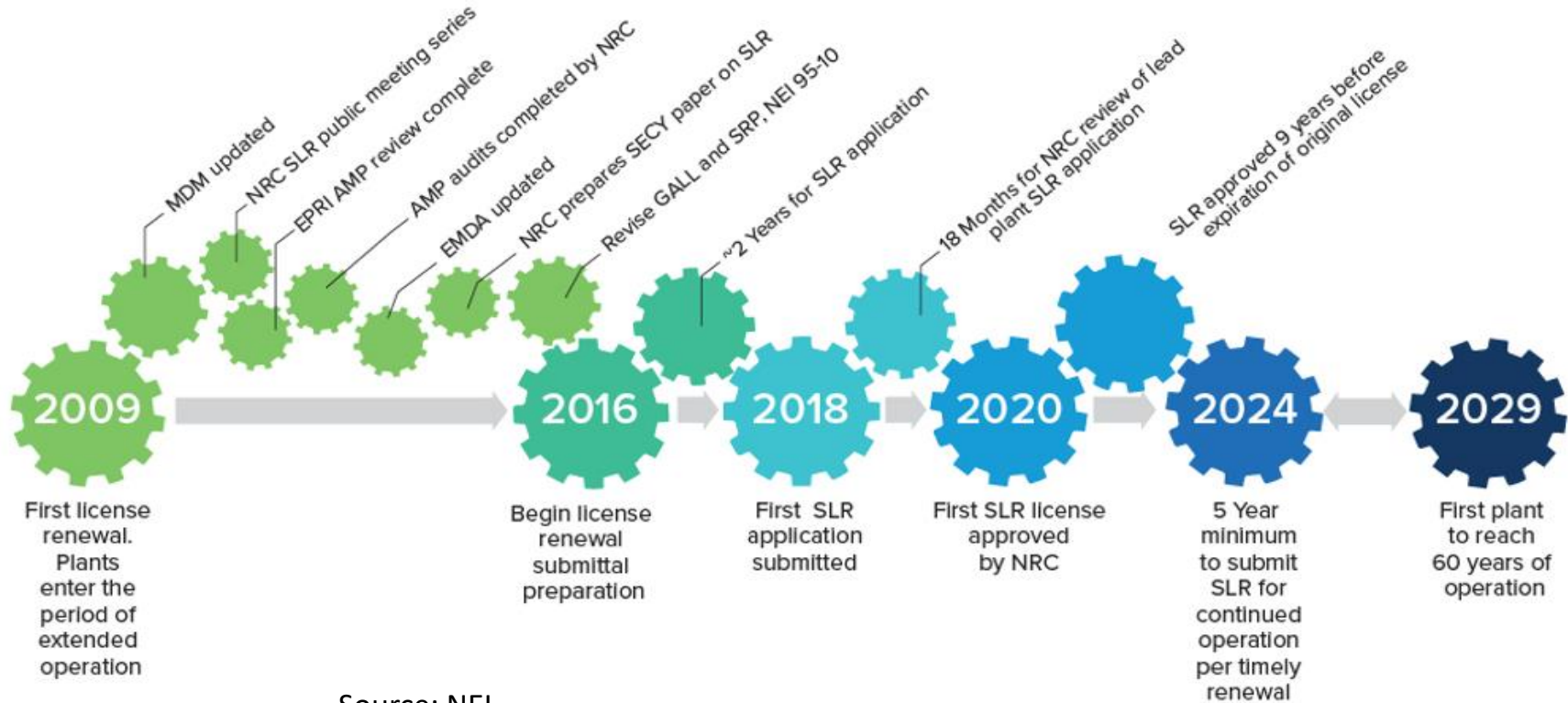
- During operation, nuclear plants emit essentially no greenhouse gases
- The U.S. produces more than 5 billion metric tons of carbon dioxide each year
- Nuclear energy also prevents approximately half a million tons of nitrogen oxide (equivalent to that released by 52 million cars) and nearly 1 million tons of sulfur dioxide annually in the U.S.
- Nuclear plants are vital for our local, state, and national clean air goals
- Steady, reliable baseload electricity production from nuclear plants allows for investment in intermittent sources such as solar, wind and other options

US Nuclear Generation Capacity



Source: NRC

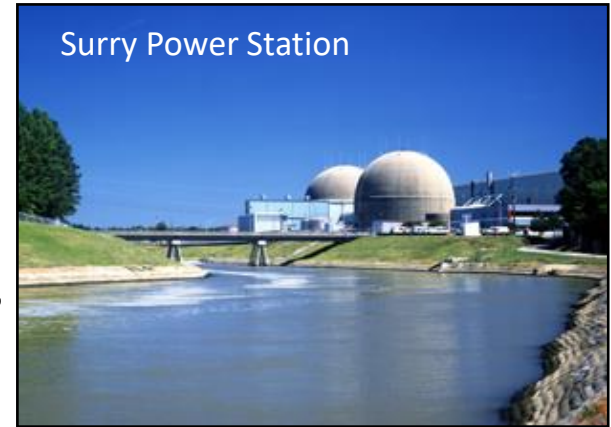
US Industry SLR Roadmap



Source: NEI

Dominion Energy Decision to Pursue SLR

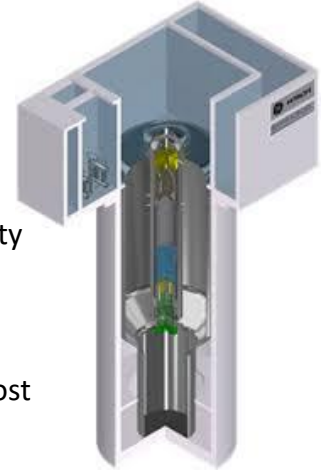
- Virginia Clean Economy Act – Zero carbon emissions by 2050
- Surry Power Station is the 1st station in fleet to reach end of life (2032/2033)
- Makes sense for Dominion Energy, stakeholders and customers
- Economic landscape was supportive
- Surry received extended license – May 4, 2021
- North Anna expected to receive extended license early 2022



Small Modular Reactor Development

Overview

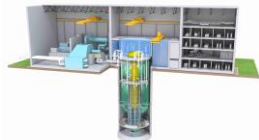
- Key Benefits to Advancing the Technology
 - Clean, safe, and reliable energy source
 - Opens opportunities for technology development and job creation in the Commonwealth
 - Builds upon the company's half-century nuclear expertise
 - May be coupled with other energy sources (such as renewables) while increasing grid stability and security
 - Siting flexibility for locations unable to accommodate more traditional power generation
 - Substantially higher power density than renewables (facilities require substantially less land)
 - Compact designs that can be factory-fabricated and delivered to a site, reducing construction time and cost
- Business Drivers
 - Enables achievement of the state/federal net zero targets and offers a diverse long-term energy resource
 - Expected levelized cost of energy competitive with other clean energy resources
 - Lower capital investment to firm customer load profile
 - Offers the potential for scalable assets that may be placed on greenfield sites or at existing sites



SMRs: Advancing Solutions to Meet Net Zero Targets

Advanced Reactor Technologies

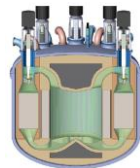
Others expected to evolve in the coming years



- BWRX-300 program is in development (275 MWe net, max)
- **Light-water boiling water reactor (LWBWR) technology**
- Based on their U.S. NRC-licensed, 1,520 MWe ESBWR
- Expected to be commercially **available within 3-5 Years**



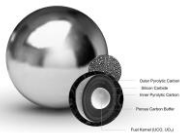
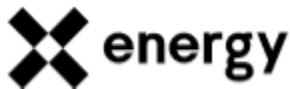
- Energy Multiplier Module (EM²) is under research
- **Helium-cooled fast reactor technology**
- Intended to operate 30 years on one uranium fuel cycle
- Expected to be commercially **available in 10-15 Years**



- Molten chloride fast reactor is under research
- **Molten salt reactor (MSR) technology**
- Molten chloride salt fuel serves as both the fuel and the coolant
- Expected to be commercially **available in 10-15 Years**



- Traveling wave reactor is under research
- **Liquid sodium-cooled fast reactor technology**
- Uses depleted uranium as the fuel
- Expected to be commercially **available in 10-15 Years**



- Xe-100 program is under research (75 MWe gross)
- **High-temperature gas-cooled (HTGC) reactor technology**
- Utilizes energy dense high assay low enriched uranium (HALEU) balls/pellets
- Expected to be commercially **available in 10-15 Years**

Main Control Room Modernization

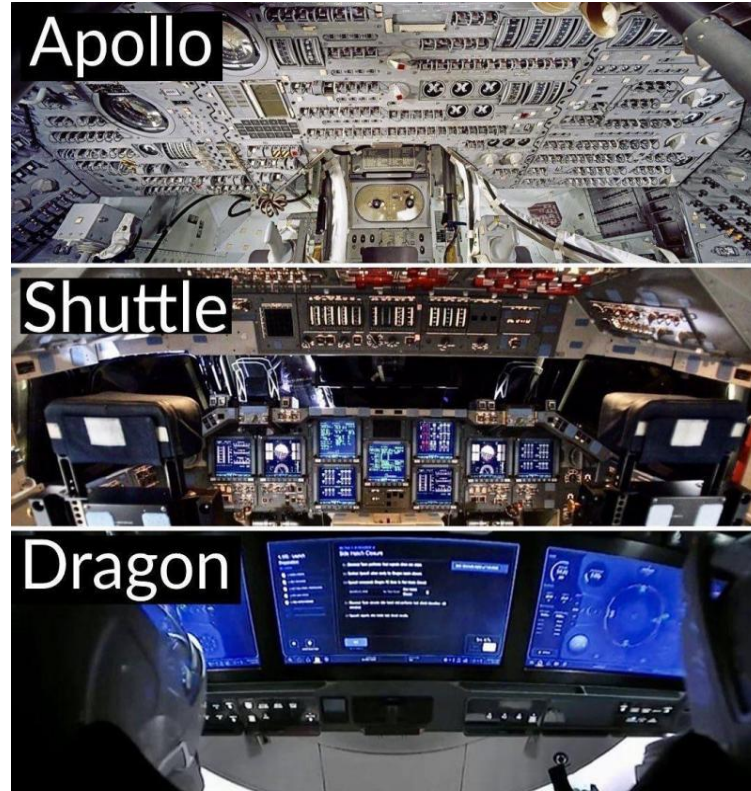


Image created by Ahmed Banafa, retrieved from <https://www.linkedin.com/pulse/spacex-dragon-crew-journey-digital-transformation-ouabi/> on June 4 2020