Nuclear: Today, Tomorrow and the Future

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DUKE ENERGY®

BUILDING A SMARTER ENERGY FUTURE®

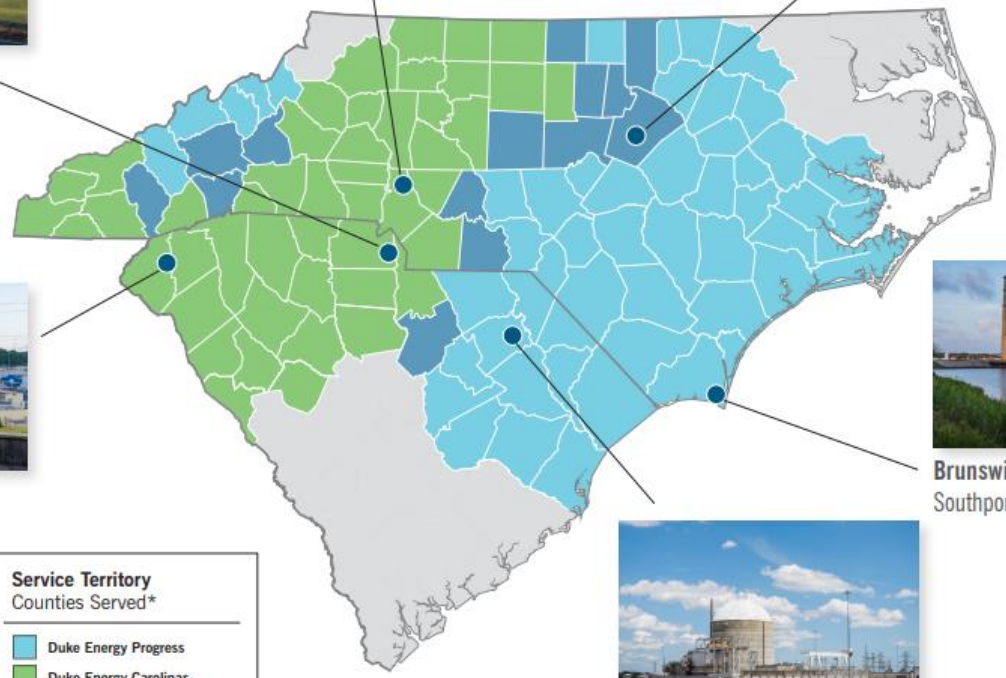

TODAY
TOMORROW
FUTURE

Nuclear Empowers Us TODAY

McGuire Nuclear Station
Huntersville, N.C.

Harris Nuclear Plant
New Hill, N.C.

Catawba Nuclear Station
York, S.C.

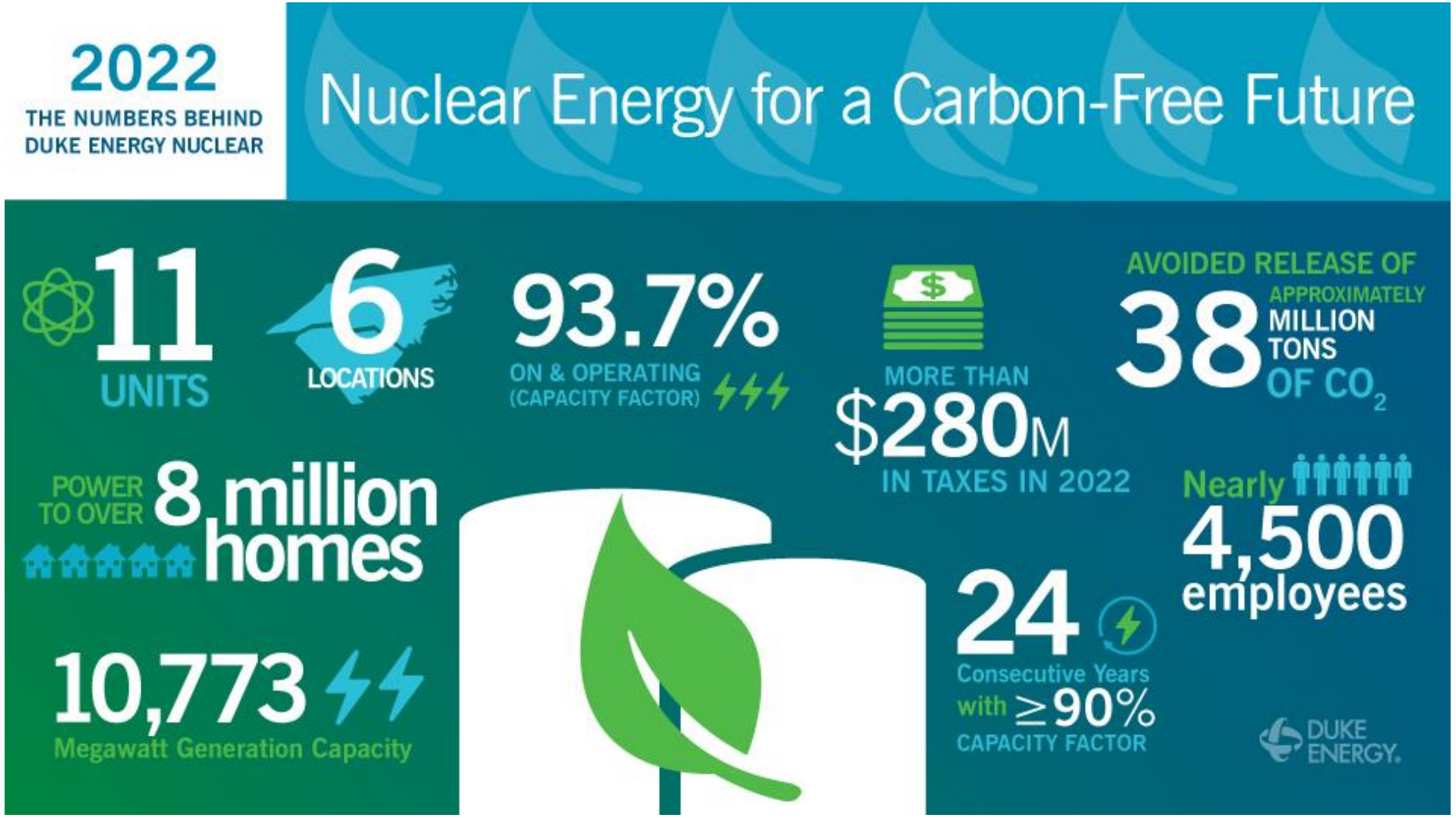


Oconee Nuclear Station
Seneca, S.C.

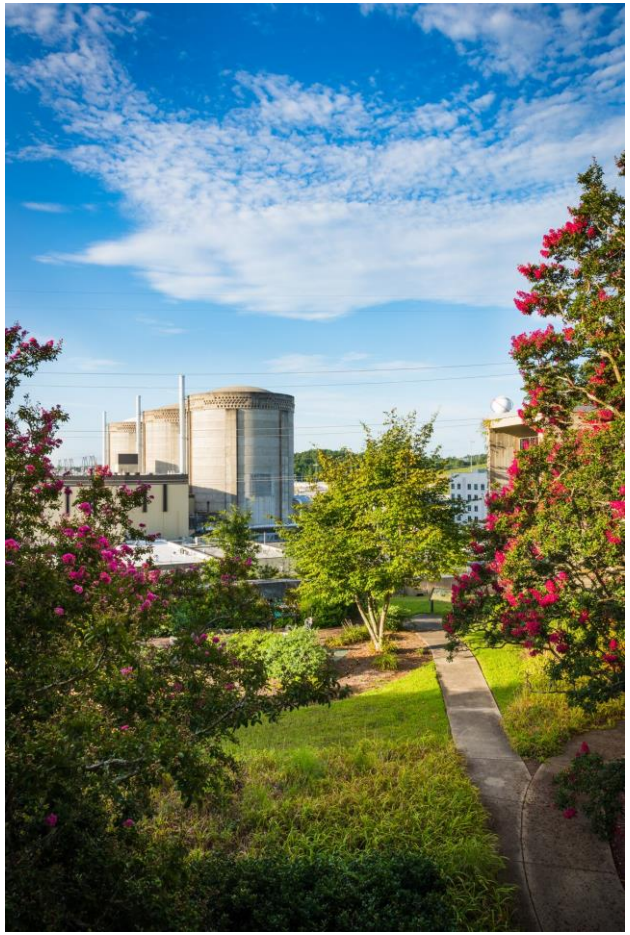
Brunswick Nuclear Plant
Southport, N.C.

Robinson Nuclear Plant
Hartsville, S.C.

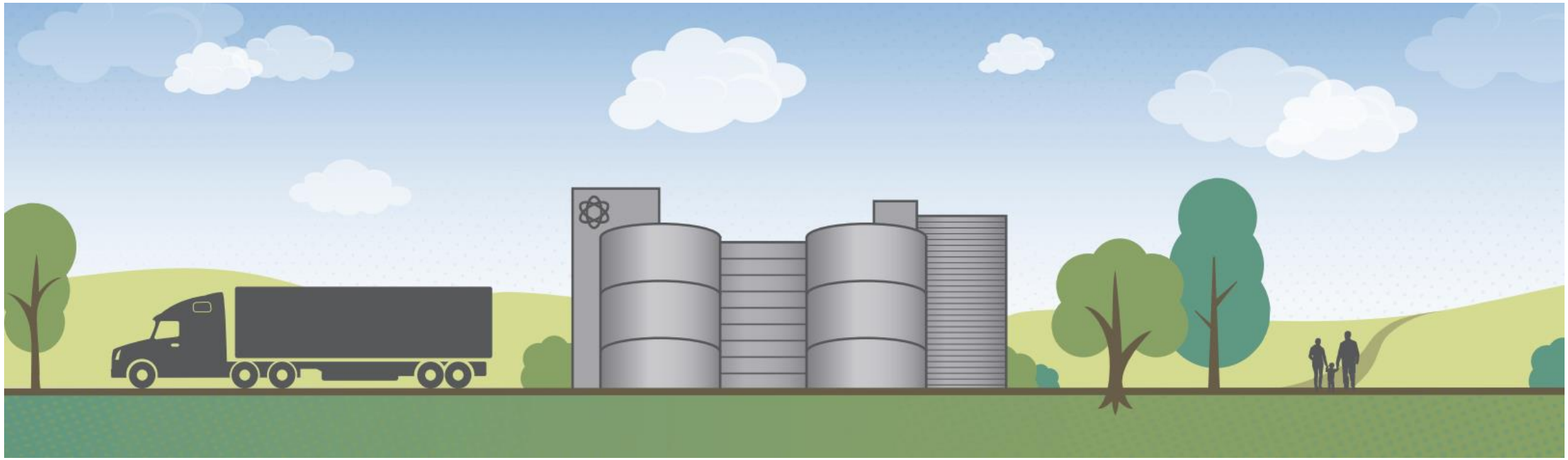
The Value of Nuclear Generation



Nuclear Empowers Us TOMORROW

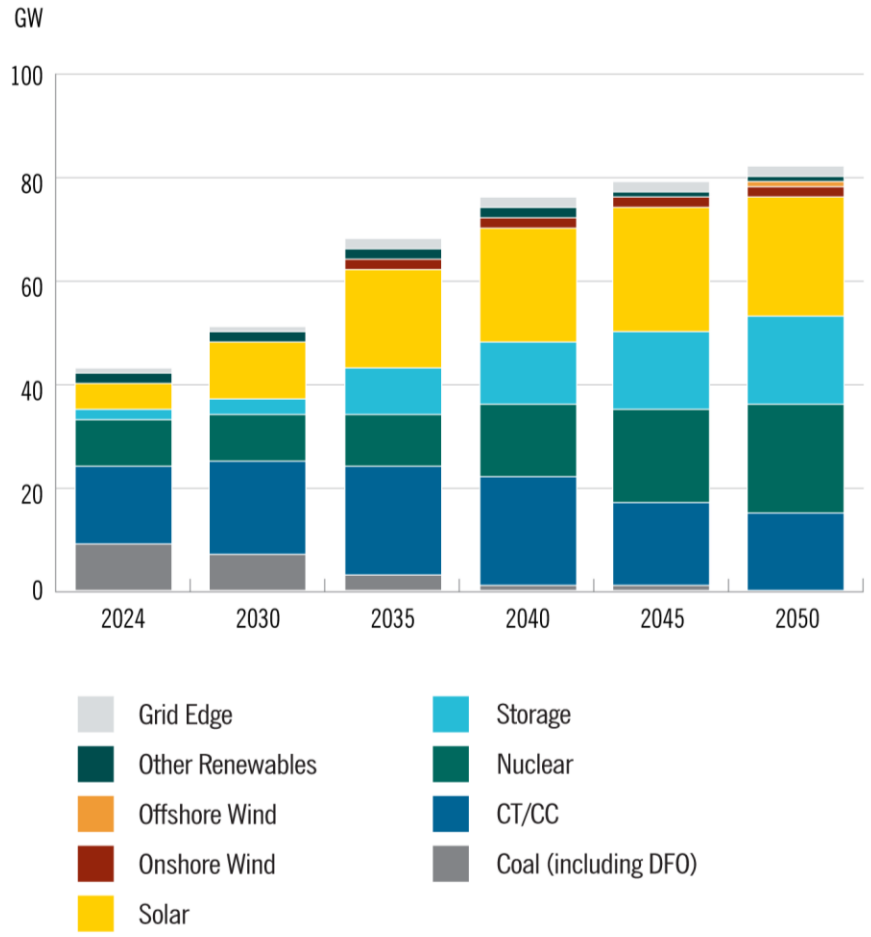


Nuclear Empowers Us in the FUTURE

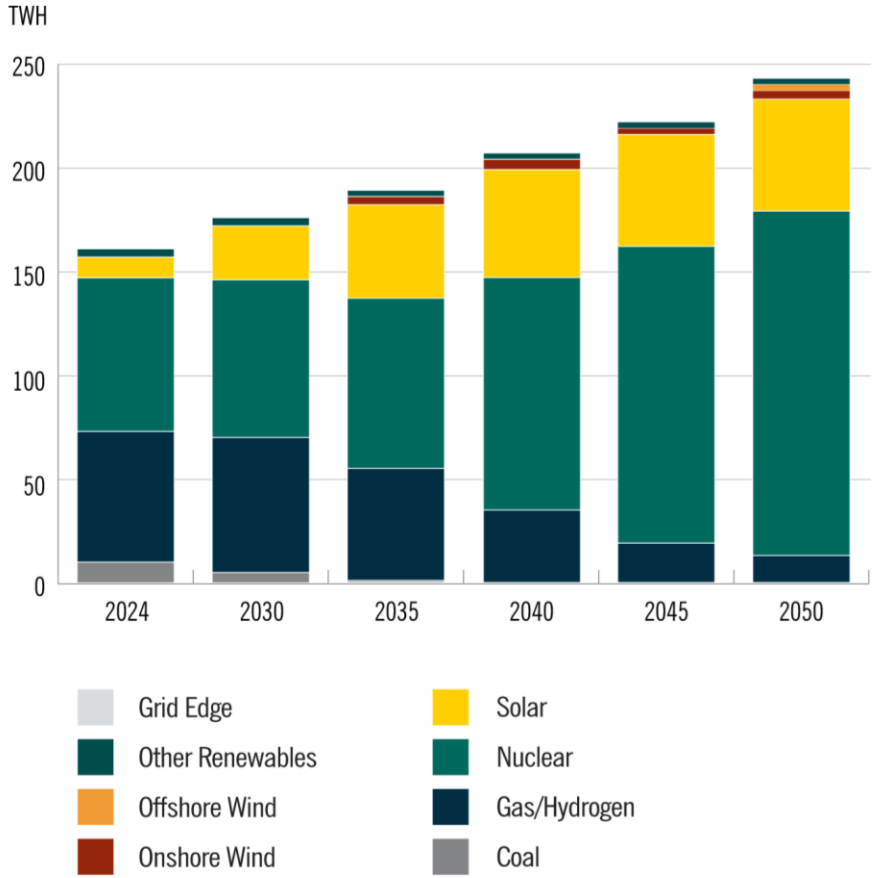


Carolinas Resource Plan: Capacity and Energy

Capacity Mix Over Time

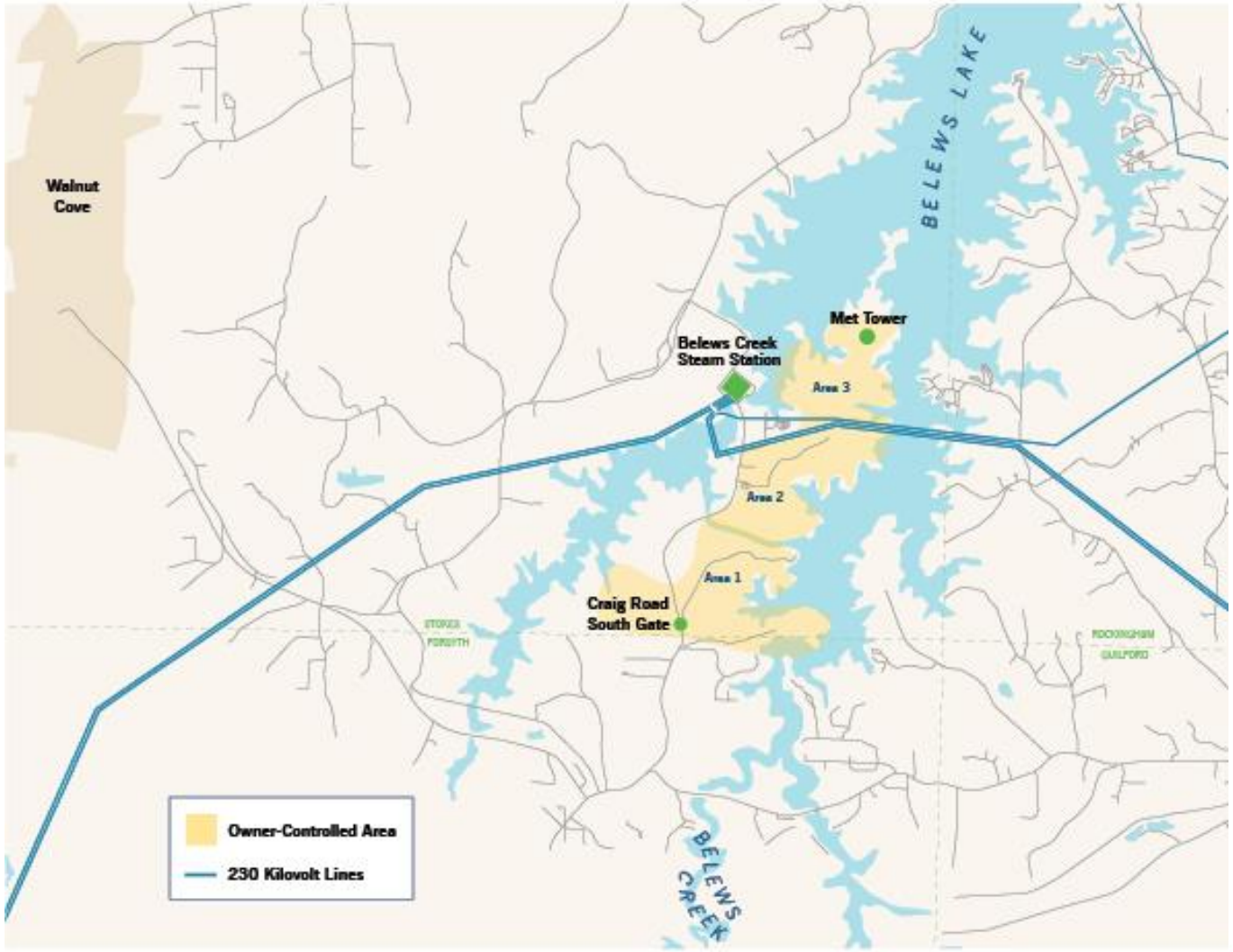


Energy Mix Over Time

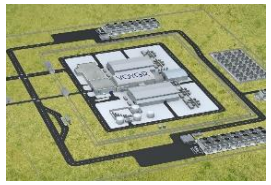


Primary Siting Factors

- Water availability, existing infrastructure
- Population centers
- Environmental, ecological, seismic and soil
- Federal tax incentives



Technology Assessment Summary

	Small Modular Reactors (SMRs)	Advanced Reactors (ARs)
Description	Light-water-cooled, like current fleet but typically ≤300 MW and have simpler designs, technology available today	Non-light water cooled, e.g., gas, liquid metal, molten salts; typically have increased efficiencies, once available
Use Case	Baseload generation, standard fuel	Flexible operations, load following, thermal storage and process heat
Leading Technologies	 GEH BWRX-300  NuScale VOYGR  Holtec SMR-160  Westinghouse AP300	 TerraPower GEH Natrium  Kairos KP-FHR  X-Energy Xe-100

Technology Insight

- Targeting first plants to be built in early- to mid-2030s, small modular reactors have an advantage as technology is proven today

We Are

- Engaging with leading vendors for deep-dive design reviews and project updates
- Participating in the DOE's National Reactor Innovation Center (NRIC) testing of advanced nuclear construction technologies
- Embedded an operational team with the TerraPower Natrium project

Small Modular Reactors (SMR)

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SMR Benefits

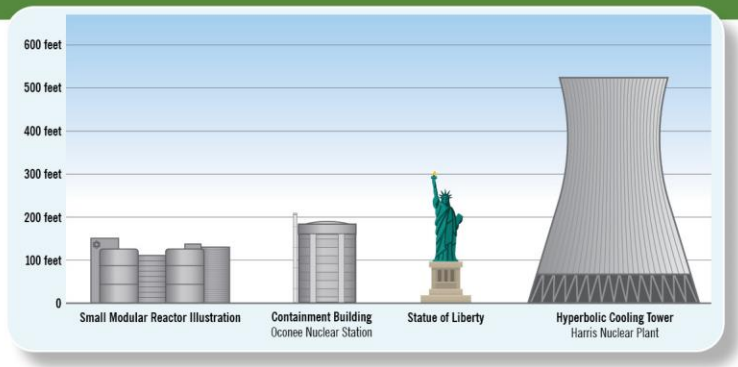
- Small reactors
- Simple designs
- Enhanced safety features
- More standardized components
- More affordable
- About one-third of the land footprint
- Smaller emergency planning zones
- More operational flexibility

SMR Site
average land footprint is
300-500 acres

Traditional Nuclear Plant Site
average land footprint is 1,793 acres

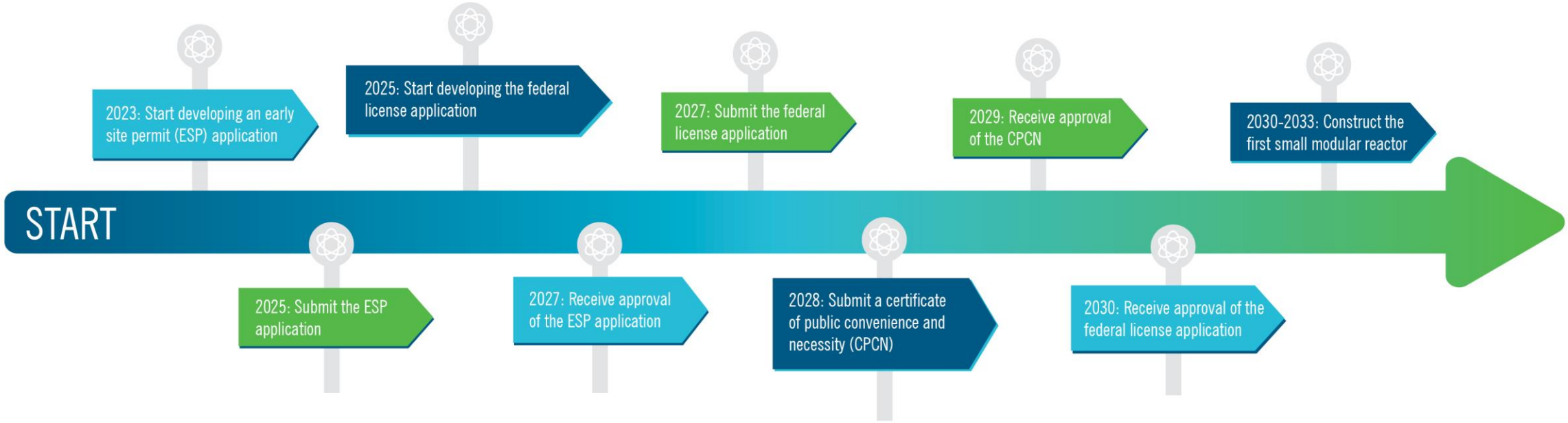
Traditional Nuclear Site and SMR Similarities

- Clean, carbon-free energy
- Always on, reliable and available 24/7
- Safe
- Economically beneficial to local communities, e.g., tax base, high-wage jobs and employee volunteerism
- Needs water, transmission infrastructure, railway and skilled workforce



The Road to Advanced Nuclear Generation

A 10-year journey with many stops along the way



To proceed, Duke Energy will need support from regulators, including clear signals from South Carolina and North Carolina indicating they will support advanced nuclear technology to serve customers.


TODAY
TOMORROW
FUTURE