

Role of and Path to Advanced Nuclear Energy Technologies

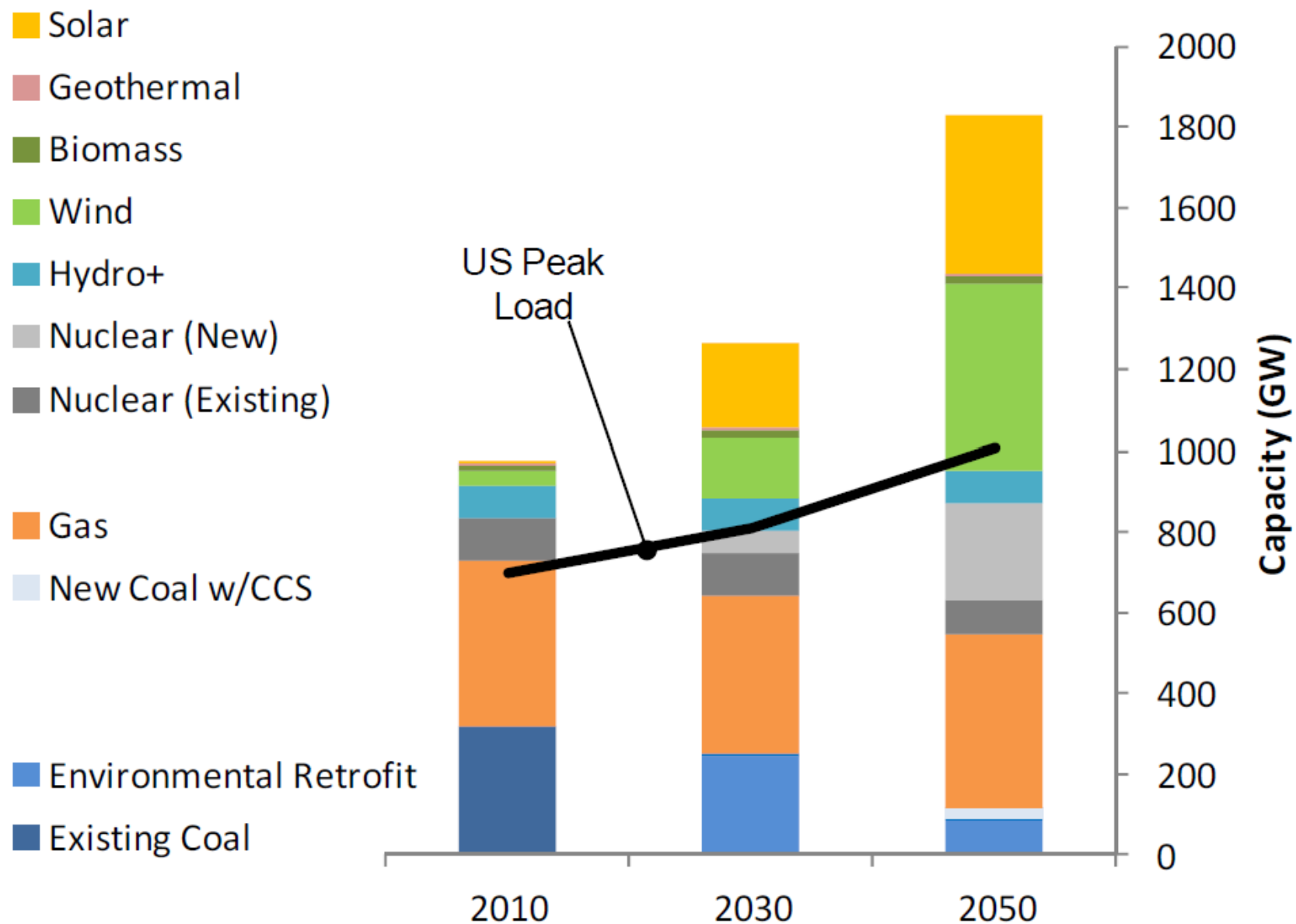
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Key Questions to Consider

- What is the role of nuclear energy in the future?
- Why advanced reactors/technology?
- What is the role of industry and government in this process?
- What outcomes should we expect from investment in advanced nuclear technology?



PRISM 2.0: Regional Energy and Economic Model Development and Initial Application: Phase 2: Electric Sector CO₂ Reduction Options to 2050: Dimensions of Technology, Energy Costs, and Environmental Scenarios. EPRI, Palo Alto, CA: 2013. 1025402.

Why advanced reactors?

- **Technologies must be responsive to key nuclear questions:**
 - Develop more inherently safe designs.
 - Address fuel cycle issues to demonstrate long term sustainability.
- **Insure strength of the US economy through technologies that:**
 - Achieve significant capital cost reductions
 - Are highly efficient and provide operational flexibility
 - Account for future uncertainties (opportunities) through product diversity

Innovation in Energy requires public/private partnership

- **The role of industry:**
 - **End users** – communicate what we want and need from technology
 - **Technology companies** – identify what is possible and innovate to deliver it to market
- **The role of government:**
 - **National Labs** – provide foundation of core R&D and infrastructure necessary to support an uncertain future.
 - **DOE** – partnership with industry to buy down risk of development and demonstrations (“valley of death”).
 - **Regulator** - Facilitate deployment through efficient and timely regulatory environment

Advanced Reactor Working Group



NUCLEAR ENERGY INSTITUTE

The logo for the Electric Power Research Institute (EPRI) consists of the letters "EPRI" in a stylized, blue, sans-serif font.

The logo for Southern Company features the words "SOUTHERN COMPANY" in a black, sans-serif font, with a red triangle graphic to the right.

The logo for Entergy features a red sun-like graphic with horizontal lines, followed by the word "Entergy" in a black, serif font.

The logo for SCE&G features a blue swoosh above the text "SCE&G" in a bold, black, sans-serif font, with "A SCANA COMPANY" in a smaller font below.

The logo for the Tennessee Valley Authority (TVA) features the letters "TVA" in a white, sans-serif font inside a blue square.

The logo for Exelon features a colorful, multi-colored swoosh followed by the word "Exelon" in a blue, sans-serif font.

The logo for Dominion features a blue circular graphic with a white sun-like symbol, followed by the word "Dominion" in a black, sans-serif font.

The logo for Duke Energy features a blue and green circular graphic, followed by the words "DUKE ENERGY" in a blue, sans-serif font.

The logo for Southern Company features the words "SOUTHERN COMPANY" in a black, sans-serif font, with a red triangle graphic to the right.

ARWG Mission

- Consolidate industry opinions on the cost and performance expectations for advanced reactors
 - Informs technology developers and the investment community
 - Aids in the alignment of R&D programs with industry perspectives
- Support the development of licensing pathways that reduce the barriers to deployment of new technology while maintaining a standard of excellence in performance

Time is of the essence

2020s

- Small scale demonstrations (target 2025)
- Technology validation
- Utilize existing licensing paradigms

2030s

- Large scale demonstrations, likely power reactors
- Demonstration of enhanced licensing pathway

2035-2040

- Commercial technology in market
- Enhanced licensing pathway fully realized