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?

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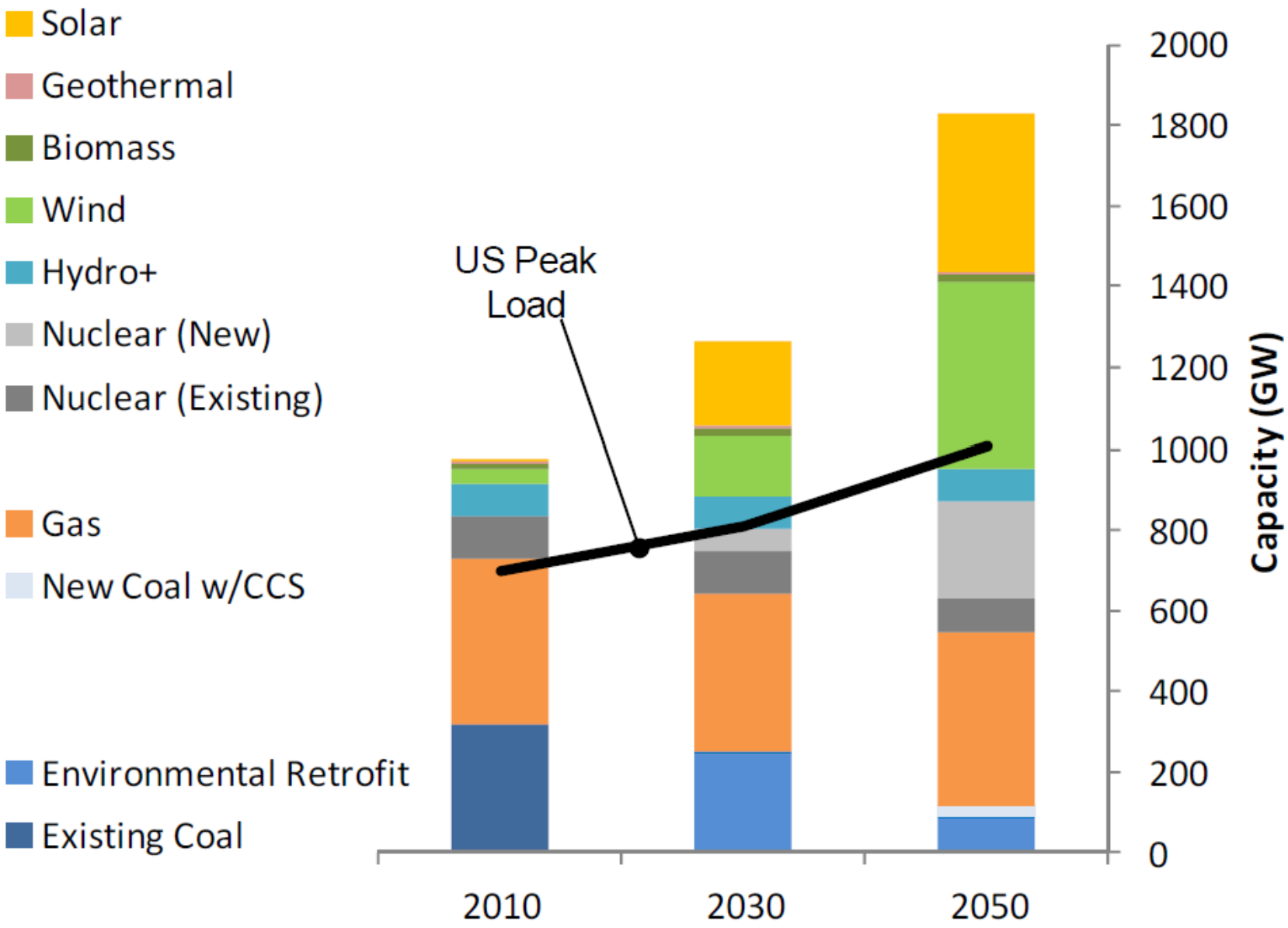

PRISM 2.0: Regional Energy and Economic Model Development and Initial Application: Phase 2: Electric Sector CO2 Reduction Options to 2050: Dimensions of Technology, Energy Costs, and Environmental Scenarios. EPRI, Palo Alto, CA: 2013. 1025402.

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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

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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

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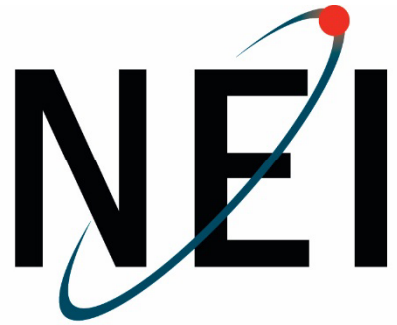
Advanced Reactor Working Group



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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

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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

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