Advanced Nuclear Technologies

NCSL Task Force on Energy Conversion

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Office of Nuclear Energy – Mission Pillars

• Advance nuclear power to meet the Nation's energy, environmental and national security needs

• Resolve technical, cost, safety, security and regulatory issues through research, development and demonstration
Nuclear Beyond Electricity – Advanced Reactors

**NOW**

- Baseload Electric

**FUTURE**

- Advanced Reactors
  - Large LWRs
  - SMRs
  - Micro Reactors

- Chemical Processes
- Heat
- Hydrogen
- Clean Water

Diagram showing the transition from current baseload electricity to future applications involving advanced reactors and their potential uses in processes such as hydrogen production and clean water generation.
The Future of Nuclear

Clean Transit Hub Scenario

Industrial Hub Scenario

Courtesy of Third Eye Nuclear Remagnified
The Future of Nuclear

Clean Transit Hub Scenario

Industrial Hub Scenario
American Innovation Can Capture the Global Market

Advanced Nuclear Industry: Next Generation

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U.S. Department of Energy Programs

- **Public-Private Partnerships**
  - Small Modular Reactors (SMR)
  - Microreactors, Mobile Microreactors
  - Advanced Manufacturing

- **R&D Infrastructure**
  - Transient Reactor Test (TREAT) Facility restarted in 2017
  - Versatile Test Reactor (VTR)

- **Fuel Sourcing for Advanced Nuclear**
  - Prototype material
  - Supply chain development
A private-public partnership framework aimed at rapid and cost-effective development of innovative nuclear energy technologies towards market readiness

**Mission**

Provide the nuclear energy industry with access to technical, regulatory and financial support necessary to move innovative nuclear energy technologies toward *commercialization* in an accelerated and cost-effective fashion.
Congressional Support for Nuclear Energy – Strong

Current Fleet
- Investment Tax Credit
- Support to local communities impacted by nuclear power plant closures

Advanced Reactor Concepts
- Production Tax Credit
- Micro-reactors for national security locations
- Versatile Fast Neutron Source
- Advanced Reactor Demo Projects
- High Assay-Low Enriched Uranium (HALEU) fuel

Streamlined
- Reactor design
- Licensing
- Advanced conceptual design
- Acceptance of nuclear facilities
- Exports

Since 2015, over 20 bills have been introduced, 6 passed the House and signed into law. (updated 8/2/19)

Support also includes appropriating the largest funding ever for DOE...
Regulatory Pathway

• Nuclear Regulatory Commission Vision and Strategy 2016
  – NRC prepared for 1 or more novel design on the grid by 2030
  – Identified 6 key strategies for preparation

• Industry is “ahead of schedule”
  – One company going through design certification for an SMR
  – Five companies engaging on pre-licensing activities

• Partnerships with multiple organizations (DOE, Electric Power Institute, etc.) to ensure readiness
Summary

- Profound opportunity for new nuclear growth exists:
  - New proposed designs to meet market needs and offer new processes
  - American innovation leading the way on novel reactor concepts
  - Support energy security, economic and environmental goals

- The Administration is committed to advancing nuclear energy in the
  United States.

- Congress is empowering DOE and the NRC to be responsive to industry
  needs in developing new designs to market.

- The demand for domestically-generated, reliable, resilient, and clean
  baseload electricity will continue to drive many countries toward nuclear
  power as an integral part of their energy security and national economic
  and environmental goals.
Questions?

Clean. Reliable.

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