Nuclear Energy & the United States of America

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Presentation Information

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Introductory Facts

- Dec. 8, 1953 “Atoms for Peace” Speech
- The world produces as much electricity from nuclear energy as it did from all sources combined in 1960.
- Since 1980 total world energy use grew by nearly 50%, with electricity growth even stronger.

Introductory Facts

- In the U.S., nuclear energy is the second largest source of electricity.
- U.S. Department of Energy estimates that in the United States, 393,000 megawatts of additional capacity will be needed by 2020.

U.S. National Energy Policy

- Introduced in May 2001.
- Balanced, Comprehensive, and Far-sighted.
- Outlines actions to ensure that the U.S. can meet our future energy needs in the face of rapidly growing energy demand.

U.S. National Energy Policy Overall Key Elements

- Modernize and Expand the U.S. Energy Infrastructure.
- Expand and Diversify Energy Supplies.
- Increase Conservation.
- Improve Environmental Protection

U.S. National Energy Policy Role of Nuclear Power

- Nuclear Regulatory Commission (NRC) ensure safety and environmental protection are high priorities.
- Encourage NRC to facilitate efforts to expand nuclear energy generation
- Extend Price-Anderson Act
- Encourage NRC to re-license existing power plants that meet safety standards
- Increase nuclear safety enforcement
- Development of a deep geological repository for nuclear waste

U.S. Nuclear Energy Programs

- **Nuclear Power 2010 Initiative**
  - Joint government/industry initiative
  - Decision to order new plants by 2005 for deployment by 2010.
  - Barriers to deployment of new nuclear power plants include; significant cost and schedule uncertainties associated with the new untested licensing processes for siting, licensing, and operating new nuclear power plants, and the high capital costs of existing certified designs

U.S. Nuclear Energy Programs

- **Generation IV Nuclear Energy Systems Initiative/Generation IV International Forum (GIF)**
  - Evaluates nuclear energy concepts, selects the most promising concepts for further development and defines the research and development needed to bring these concepts to maturity.
  - GIF is a formal, government sanctioned organization committed to collaboratively pursue R&D on Generation IV systems

U.S. Nuclear Energy Programs

- Nuclear Energy Research Initiative (NERI)
  - Started in 1999 to sponsor innovative scientific and engineering R&D to address key issues affecting the future use of nuclear energy.
- International Nuclear Energy Research Initiative (I-NERI)
  - Promote bilateral and multi-lateral research with other nations

U.S. Nuclear Energy Programs

- Advanced Nuclear Fuel Cycle Initiative (AFCI)
  - Designed to reduce the volume and toxicity of nuclear waste.
    - Develop effective technologies to accomplish three steps to spent fuel treatment
      - Reduce Spent Fuel Volume
      - Separate long-lived highly toxic elements
      - Reclaim spent fuel energy

Additional Energy Program

- Hydrogen Fuel Initiative
  - The hydrogen fuel initiative will include $720 million in new funding over the next five years to develop the technologies and infrastructure to produce, store, and distribute hydrogen for use in fuel cell vehicles and electricity generation.

U.S. Department of Energy Budget for Nuclear Energy

- Research & Development $89.7M
- In 2004, request increase to $127M

Conclusion

National Energy Policy Achievements

- FutureGen
- ITER
- Yucca Mountain