

**ONE YEAR LATER: IS THE U.S. ANY CLOSER TO
BUILDING A NEW NUCLEAR POWER PLANT?**

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Mr. Miller has been involved with the commercial nuclear industry since 1973. He has served in a wide variety of engineering, supervisory and management positions with utilities, engineering and consulting firms as well as the federal government. He is currently responsible for research programs involving advanced reactor technology, nuclear fuel, and related fundamental sciences.

Mr. Miller received his bachelor's degree in nuclear science from the State University of New York in 1973.

Nuclear Power 2010 Program Status Report

Is the U.S. Any Closer to Building New Nuclear Power Plants

*Prepared for the
2005 TIACT Annual Technical
Meeting*

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Presentation Overview

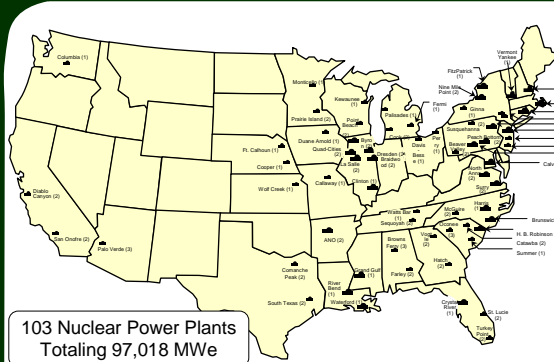
- ◆ Nuclear Energy in the U. S.
- ◆ Barriers to Future Deployment
- ◆ Department of Energy's Nuclear Power 2010 Program
 - Scope/Goal
 - Activities/Accomplishments
- ◆ Prospects for New Nuclear Plants



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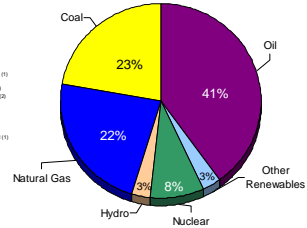
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Why Nuclear Energy? ... we depend on it today

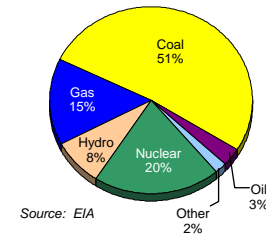


(Number of operating units per site shown in parenthesis)

National Energy Policy calls for expansion of Nuclear Energy



Energy Production



Source: EIA

Electricity Production



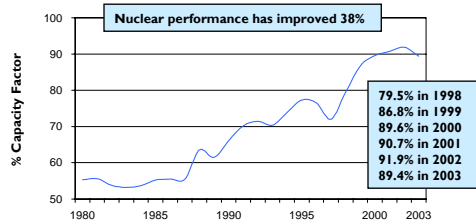
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Why Nuclear Energy? ... plant safety, performance, and economics have steadily improved over the past 20 years

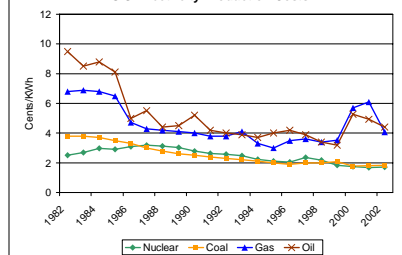
- ◆ Excellent plant management and operational experience
- ◆ Well-developed safety culture and effective regulation
- ◆ Lowest production costs for fueled-generation

Nuclear Capacity Factor is at an All-Time High



Source: Nuclear Energy Institute

U.S. Electricity Production Costs



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Why Nuclear Energy? ... can support future energy demand

◆ Projected electricity demand

- EIA forecasts the U.S. will need about 335,000 megawatts of new generating capacity by 2025

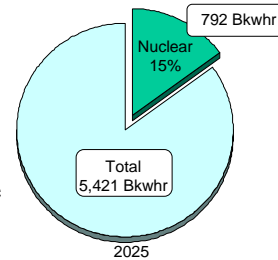
◆ Fuel diversity

- All recent capacity additions and projected future additions are primarily fueled by natural gas
- Natural gas prices have risen steadily

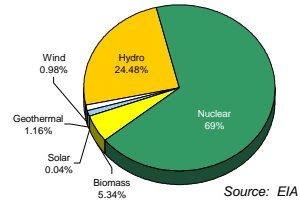
◆ Nuclear power is a clean, reliable base load energy source

- Provides ~70% of the Nation's emission-free electricity
- Avoids 175 MMTC each year
- Helps reduce overall NO_x and SO_x levels

U.S. Electricity Consumption



Net Non-emitting Sources of Electricity



Source: EIA



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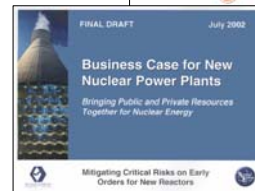
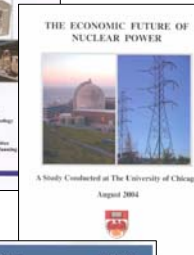
Nuclear Energy *Plant deployment challenges are not resolved*

- ◆ **Regulatory Uncertainty** -- power companies lack confidence that the untested “one-step” licensing process will not lead to excessive delays

- ◆ **Financial Uncertainty** -- financial community and power companies lack confidence in how much new plants will cost and how long they will take to reach operation

Other Issues:

- ◆ **Nuclear Waste Disposal**
- ◆ **Accident Indemnification**



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Nuclear Power 2010 *Working with Industry to Build New Nuclear Plants*

- ◆ Exploring sites for new nuclear plants
- ◆ Demonstrating key untested regulatory processes
 - Early Site Permit (ESP)
 - Combined Construction and Operating License (COL)
- ◆ Developing new light water reactor designs
 - Design Certification for new technologies
 - First-of-a-kind engineering for new standardized nuclear plant designs
- ◆ Developing concepts to mitigate financing risks



Program Goal *Pave the way for an industry decision to build at least one new advanced light water reactor nuclear plant in the United States that would begin operation early in the next decade.*

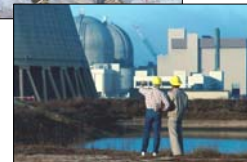


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Nuclear Power 2010 *New Plant Licensing Demonstration Projects: Three Projects*

- ◆ Tennessee Valley Authority (TVA) -- Teamed with Bechtel, Toshiba, GE, USEC
 - Cost and Schedule Study for a two-unit ABWR at Bellefonte Site
- ◆ Dominion Energy -- Consortium with General Electric and Bechtel
 - COL for ESBWR at North Anna Site
- ◆ NuStart Energy -- Consortium with 9 power companies and 2 reactor vendors
 - COL Application development
 - Site and technology to be selected
 - AP-1000 and ESBWR



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Nuclear Power 2010 Program Activities/Accomplishments

◆ Siting Evaluations

- Dominion and Exelon Site Scoping Studies completed for commercial/federal sites
- TVA Site Suitability Study regarding a new plant on the Bellefonte Site
- Texas Institute for Advancement of Chemical Technology (TIACT) Study of sites in Texas
- 2 new proposals - Southern Company and Constellation



3 ESP Projects

- Dominion Energy - North Anna
- Entergy - Grand Gulf
- Exelon - Clinton

◆ “Early Site Permit” (ESP) Demonstration Projects

- Three ESP applications filed with NRC in Fall 2003
- NRC approval expected in 2006

◆ COL Guidance and Generic Issues project initiated -- EPRI/NEI

- Develop COL application preparation guidance – draft at NRC for review
- Resolve generic COL issues with NRC
- Project completes in FY 06 – Issuance of NEI Guidance document



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Prospects for New Nuclear Plants

◆ Industry interest at highest levels since early 1980s

- Three major industry/government cooperative projects could lead to new nuclear plants in the near future
- 10 nuclear utilities and two reactor vendors involved in project consortia
- Three power companies involved in NuStart consortia are looking to pursue sites and combined licenses independent of NuStart

◆ Nuclear Regulatory Commission is actively engaged in current licensing actions and maintaining schedules

◆ Administration and Congress support deployment of new nuclear plants

- Support for Nuclear Power 2010
- Energy legislation

Prospects for new nuclear plants deployed by 2015 are very good



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