U.S. Nuclear Regulatory Commission Fuel Cycle Information Exchange 2008

Expansion of Nuclear Power in the U.S.

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NUCLEAR ENERGY INSTITUTE

Why New Nuclear Generation?

- Need for power – additional 260GW by 2030
  - Minimal baseload generation built in last 20 years
  - US population forecast – another 80 million by 2030
- $750+ billion on US energy infrastructure by 2020
  - Increase in electricity prices
- Climate change
  - Need for zero/low-emission base-load generation
- High & volatile natural gas prices
- Nuclear lowest cost base-load generating option

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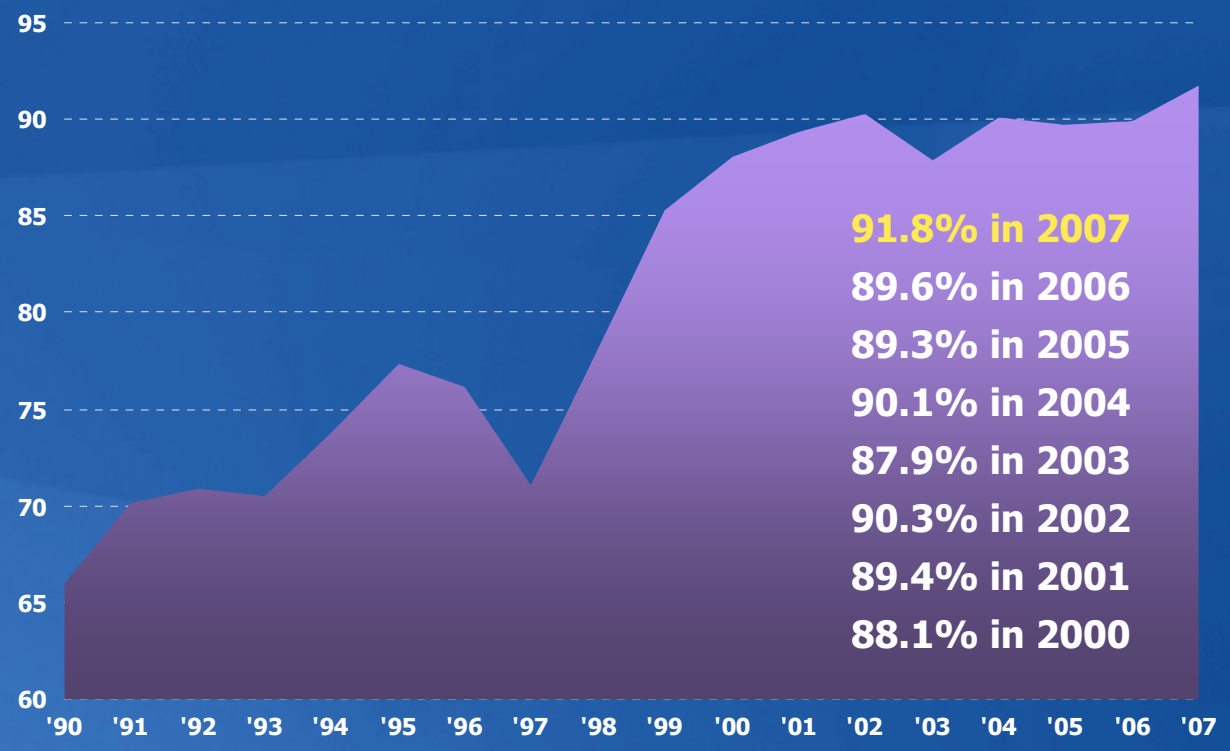
Sustained Reliability and Productivity

U.S. Nuclear Plant Average Capacity Factor



Sources: Global Energy Decisions, Energy Information Administration, NEI estimate for 2007

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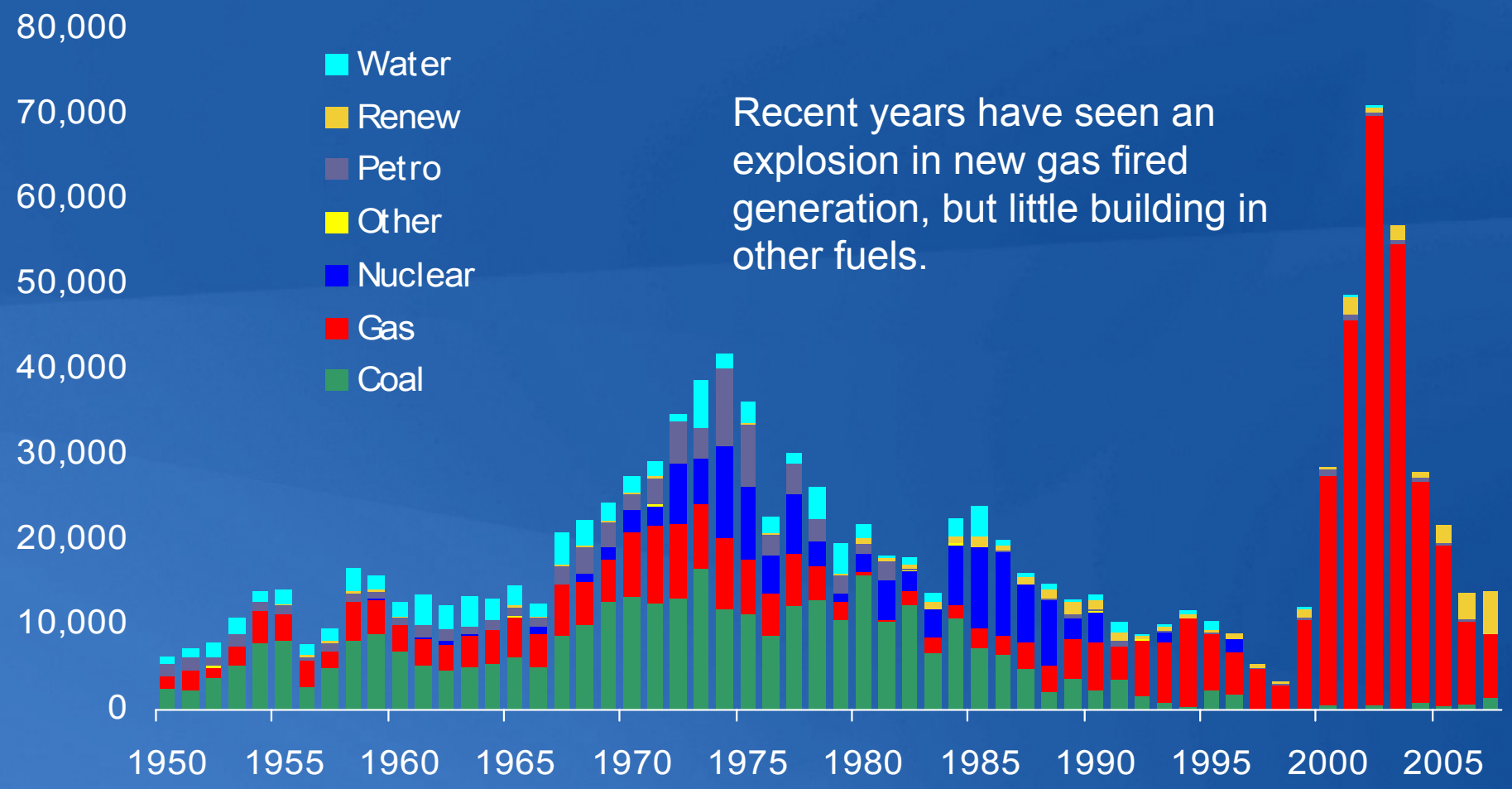
Capacity Brought Online by Fuel Type

1950-2007 (Nameplate Capacity, MW)



Source: Global Energy Decisions

Updated: 1/08

Energy Policy Act of 2005: Investment Stimulus for New Plants

- Federal loan guarantees
  - Covers up to 80% of project cost
  - Project finance, higher leverage, reduces project cost
- Production tax credits
  - $18 MWh for up to 6,000 MW
  - Up to $125 million per year for 8 years, per 1,000 MW
- Federal standby support
  - $2 billion of risk coverage for first six plants
  - Covers delays resulting from licensing or litigation

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Growing Public Support For More Nuclear Energy

Agree to renew licenses of existing plants	Favor use of nuclear energy	Keep the option to build nuclear plants	Definitely build nuclear plants in future	Accept new reactors at nearest plant
81%	64%	70%	62%	59%

Source: Bisconti Research Inc. – April 2008

Supply Chain Starting to Respond

- Supply chain adequate for “first wave”
- Long-lead materials (e.g., forgings) already fabricated or ordered for first wave
- Component manufacturing will respond to sustained demand
- Early signs that suppliers are gearing up

Addressing the Work Force Challenge

- Nuclear engineering enrollments up dramatically
  - Undergraduate: from 470 in the 1998-99 academic year to 1,933 in 2006-07
  - Graduate: from 220 in the 1998-99 academic year to 1,153 in the 2006-07 academic year
- Joint initiatives with organized labor and the Departments of Labor, Education, and Defense
- Industry-community college programs in 14 states
- Skilled crafts: collaborative programs in 10 states

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Fuel Supply Chain Also Responding

- Enrichment facilities being built in the U.S.
- New U.S. and international uranium mines being developed
  - Expansion of existing mines being considered
- New conversion facilities being discussed
- Fabrication capacity will also be expanded

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Managing the Financing Challenge

- First new nuclear projects will require financing support
  - Federal loan guarantees
  - State assurance of investment recovery
- Federal loan guarantees:
  - Non-recourse project financing protects parent company balance sheet
  - Higher leverage reduces weighted average cost of capital
  - Consumer benefit: Lower cost electricity
- State government support:
  - Ongoing prudence determinations and assurance of recovery
  - Recovery of financing costs during construction to reduce rate “shock”

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Project Management: Lessons Learned Provide Road Map for Success

- Detailed design complete before construction
- Integrated engineering and construction schedules
- Standardization
- Focus on quality assurance
- Safety-conscious work environment: effective corrective action, worker concern programs
- Improved planning and construction management tools
- Improved construction techniques

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Progress Toward New Plant Development

2007

3 early site permits approved
- Dominion
- Exelon
- Entergy

2 design certifications submitted
- GE ESBWR
- AREVA EPR

5 COL applications submitted
- NRG
- TVA
- Dominion
- Duke
- Constellation/ UniStar

2008

Mitsubishi APWR design certification submitted

11-15 COL applications expected

2009

Southern early site permit approved

GE ESBWR design certification issued

Additional COL applications submitted

2010

2 design certifications issued
- AREVA EPR
- Mitsubishi APWR

First COLs granted
- NRG
- TVA
- Dominion
- Duke
- Constellation/ UniStar

2011

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A Realistic Perspective

- Most projects still in early stages of development
- Should expect …
  - Changes in project ownership and structure
  - Decisions deferred pending clarity on cost, other factors
  - Decisions to suspend project development
- Positive signal: companies will not proceed unless they are confident that all risks identified, removed, mitigated

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