

U.S. Nuclear Energy: A Partner in Climate and Supply Solutions

Canadian Nuclear Association

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Review of 2008

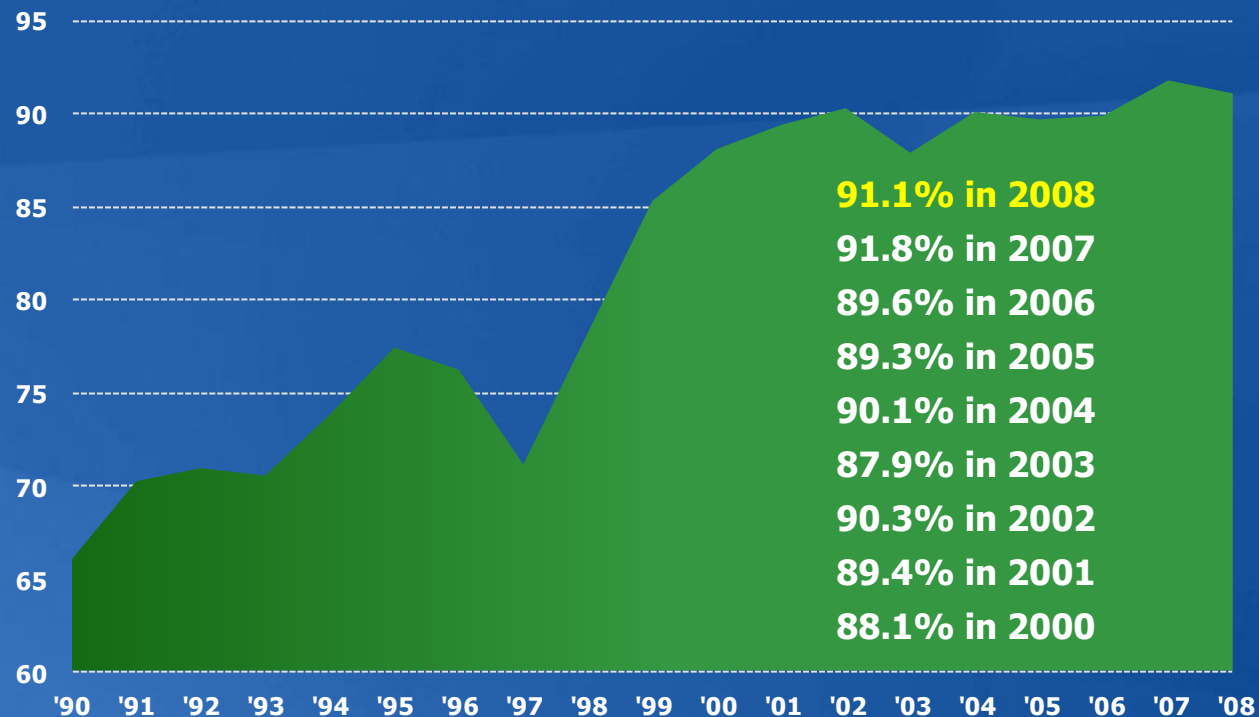
Operating Performance

Sustained Reliability

U.S. Nuclear Plant Average Capacity Factor

Highlights

- Refueling outages: 66 in 2008, 56 in 2007
- Average refueling outage duration: 37.6 days in 2008, 40.4 days in 2007



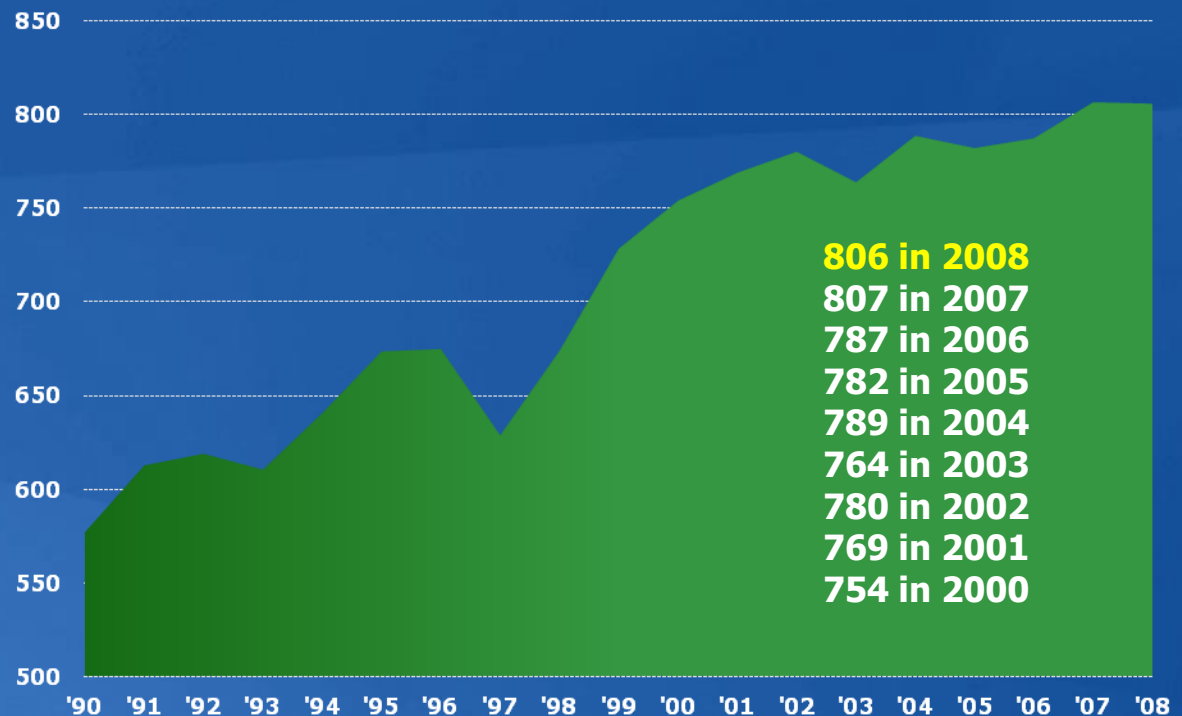
Sources: Ventyx Velocity Suite, U.S. Energy Information Administration,
U.S. Nuclear Regulatory Commission, NEI estimate for 2008

Steady Output From the Operating Plants

U.S. Nuclear Generation (billion kilowatt-hours)

Highlights

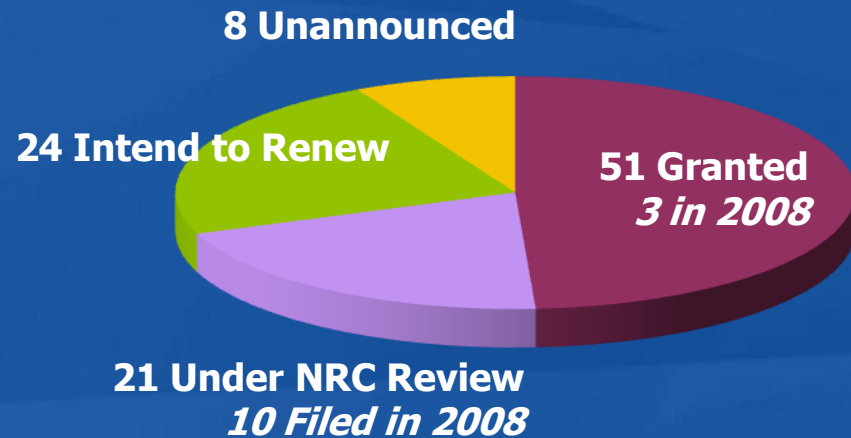
- 5,640 MW of power uprates approved since 1977
- 595 MW of uprates under review
- 2,882 MW of uprates expected by 2013



Sources: Ventyx Velocity Suite, U.S. Energy Information Administration,
U.S. Nuclear Regulatory Commission, NEI estimate for 2008

Other Key Highlights From 2008

License Renewals Continue ...



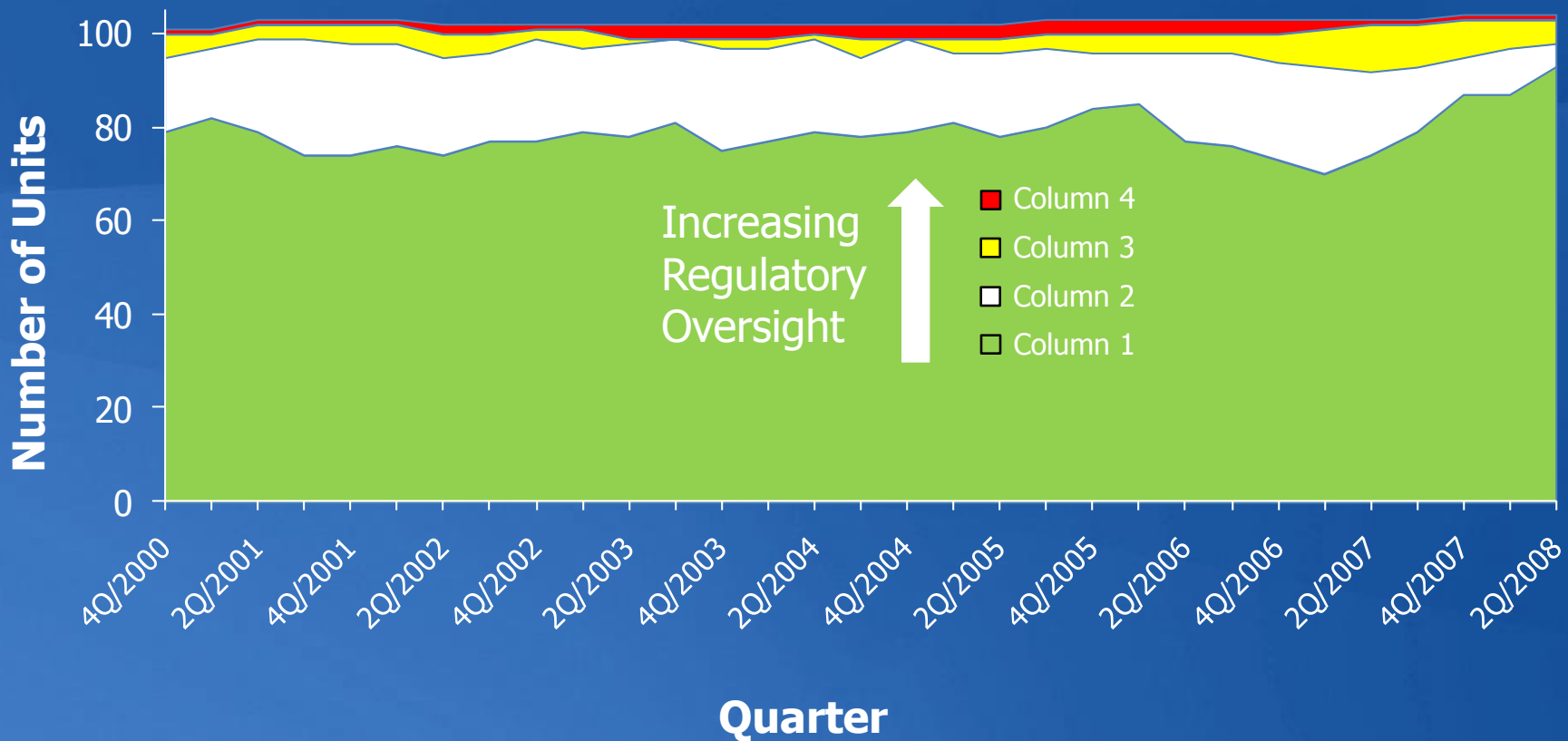
Source: U.S. Nuclear Regulatory Commission

... And America's 105th Plant Is Well Under Way

- TVA sanctioned Watts Bar 2 completion in August 2007
- 5-year, \$2.5 billion project
- On schedule and on budget for April 2012 construction completion
- Currently employs 1,500 people on-site

Best Regulatory Performance Ever: 93 Plants "In the Green"

NRC Action Matrix Summary



New Nuclear Plants: Progress and Expectations

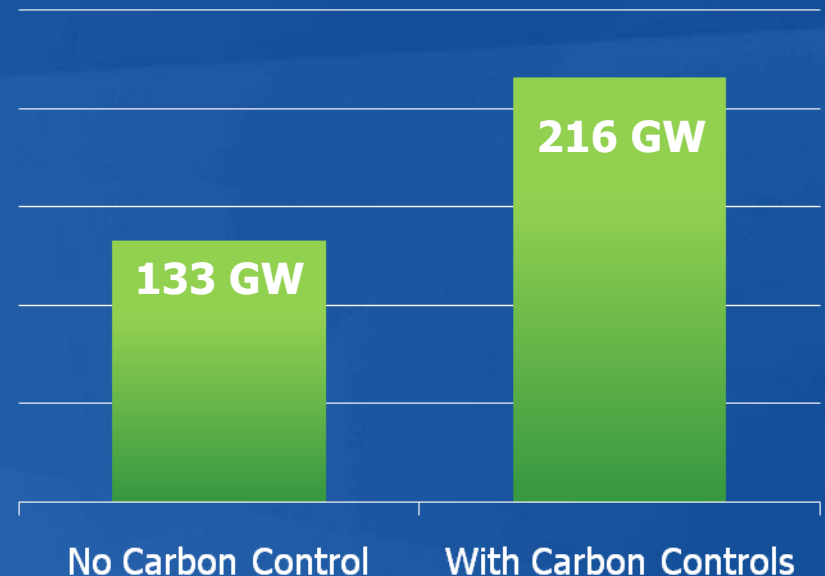


NUCLEAR
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The Business Case for Nuclear Power

- Need for new baseload capacity
- Constraints on carbon emissions
- Solid business case for new nuclear plants at commercial operation in 2016 and beyond

New Generating Capacity Needed *Assumes 0.7% Annual Growth in Peak Load*



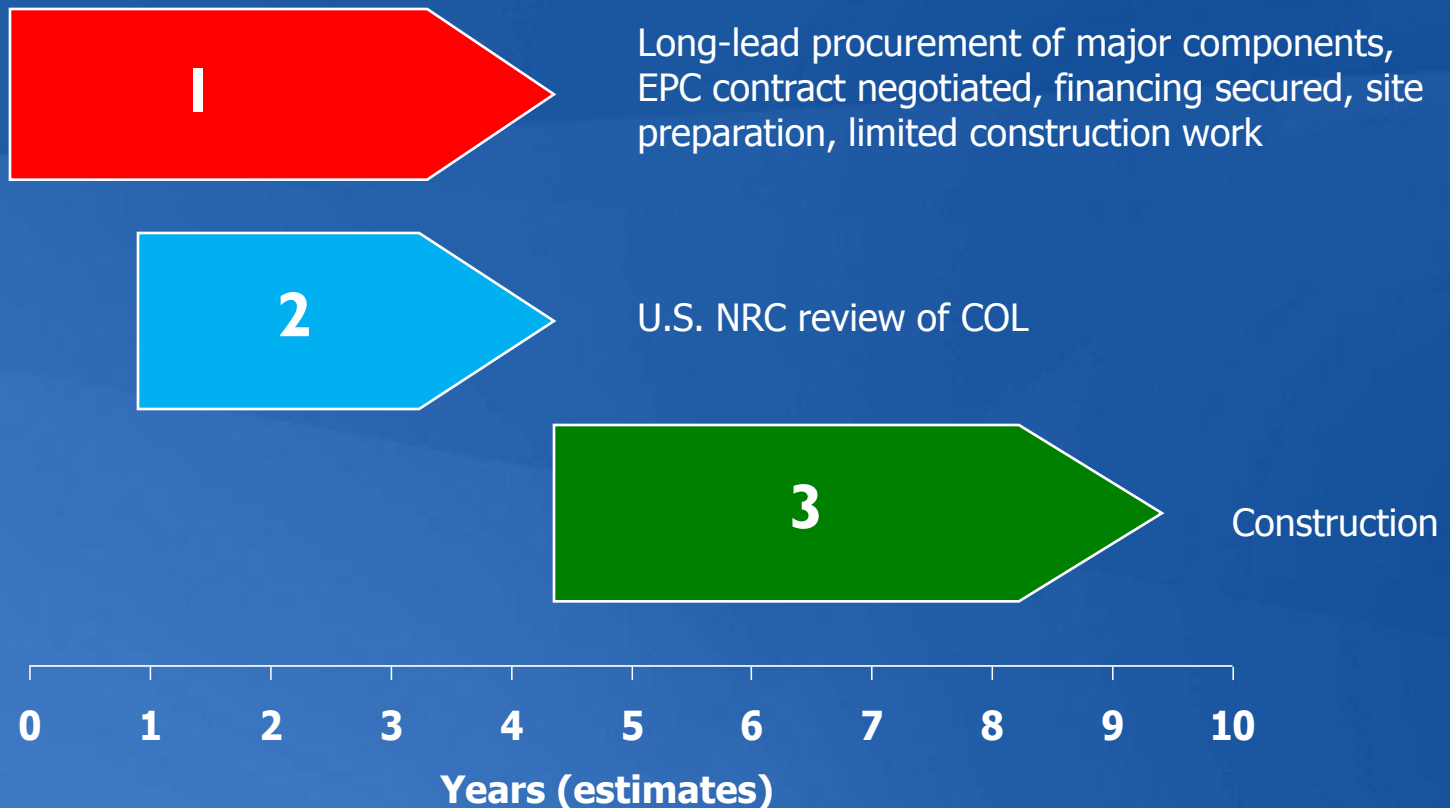
Source: The Brattle Group, "Transforming America's Power Industry: The Investment Challenge 2010-2030," November 2008

Cost Perspectives

- Not the cost of construction but the price and price stability of electricity
- Electricity price for plant regulated by state with work-in-progress payments during construction ~ \$74/MWh to \$88/MWh
 - Competitive with \$8-\$10/mmBtu natural gas
 - Average cost of natural gas
Sept '07 – Sept '08 ~ \$8.84/mmBtu

Road Map to Commercial Operation

Building a new nuclear plant is not a one-step process or decision. It is a sequence of decisions, which provides substantial flexibility.



Progress Toward New-Plant Development

2007

- 3 early site permits granted
- 2 design certifications submitted
- 4 COL applications submitted

2008

- 1 design certification submitted
- 13 COL applications submitted
- 3 engineering and procurement contracts signed
- Fabrication of long-lead components

2009-2010

- Site excavations begin
- 1 early site permit expected
- Additional COL applications



Major New-Plant Issues Being Managed by the Industry



Financing



Licensing



Supply Chain



Work Force

Financing New Baseload Capacity

- Nuclear is competitive but has a structural challenge: very large projects relative to the size of the companies building them
- This challenge can be managed
 - Supportive rate policies at the state level
 - Loan guarantees from the federal government
 - Higher leverage (up to 80 percent)
 - Non-recourse to sponsor's balance sheet

State Policies Favoring Nuclear

 Legislation in place that helps secure financing

 Regulation in place that helps secure financing

 Legislation that includes nuclear in clean portfolio standard

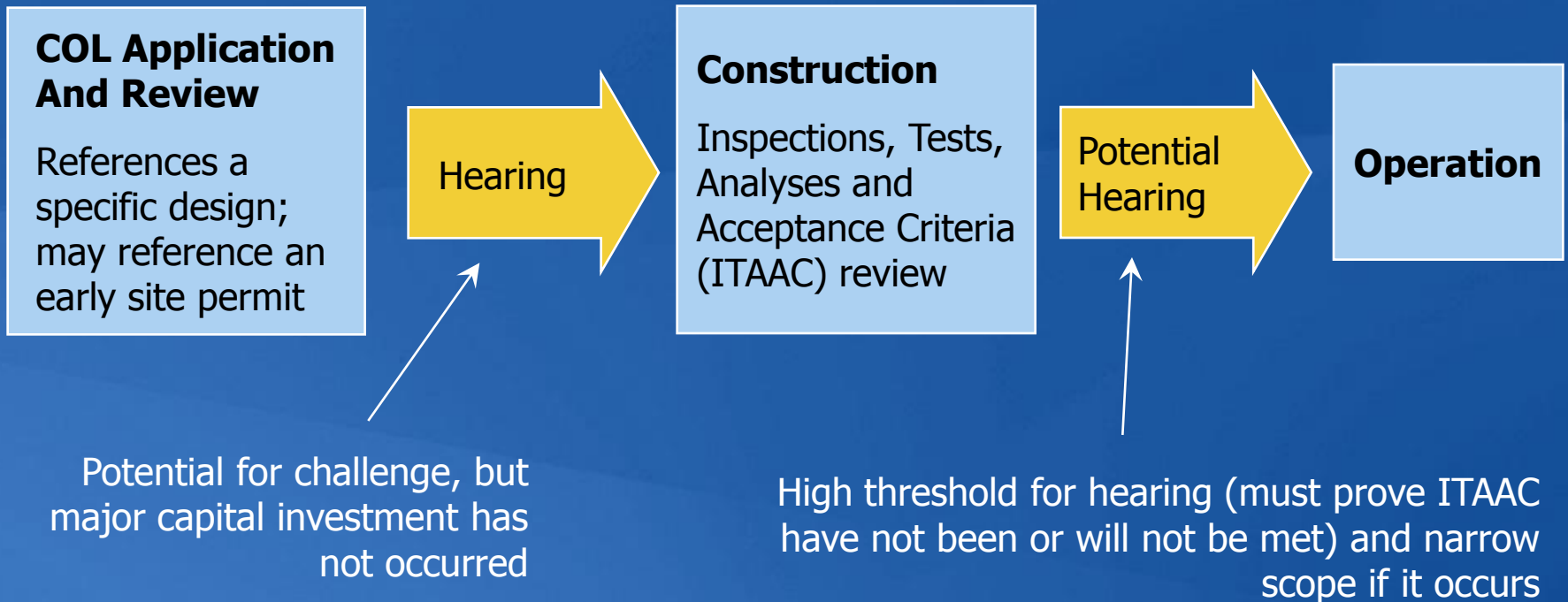
 Legislation and regulation in place that help secure financing



Status of Loan Guarantee Program

- \$18.5 billion in loan guarantee volume for nuclear power projects authorized
- Part I applications: 14 projects, 28,800 megawatts, \$122 billion in loan volume
- Co-financing from export credit agencies in France and Japan will stretch existing U.S. loan guarantee authority
- Additional loan volume necessary

New Licensing Process Reduces Uncertainty and Financial Risk



Managing the Licensing Process

- Industry approach: design-centered working groups to achieve standardization
- NRC approach: single review of standard materials, “one issue, one review, one decision”
- Protocols for construction inspection and ITAAC being developed

U.S. Manufacturers Ramping Up

Supply Chain and Fuel Supply Expansion Plans

- AREVA and Northrop Grumman Newport News, Va.
- Shaw Group and Westinghouse Lake Charles, La.
- Curtis Wright Cheswick, Pa.
- Alstom Chattanooga, Tenn.
- National Enrichment Facility Eunice, N.M.
- American Centrifuge Project Portsmouth, Ohio
- GE Hitachi Nuclear Energy Wilmington, N.C.



Rebuilding the Work Force: Supply Responds to Demand



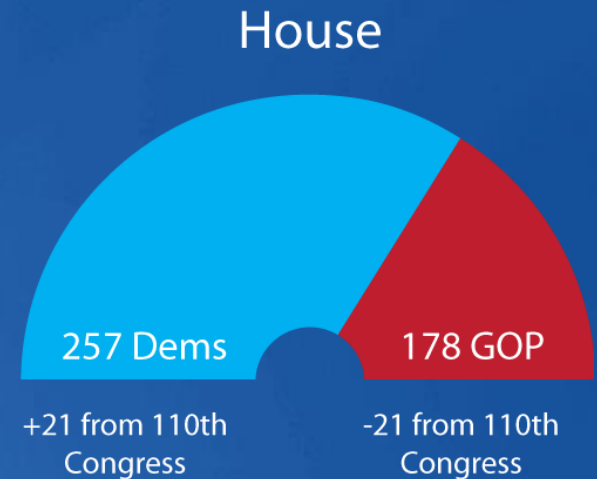
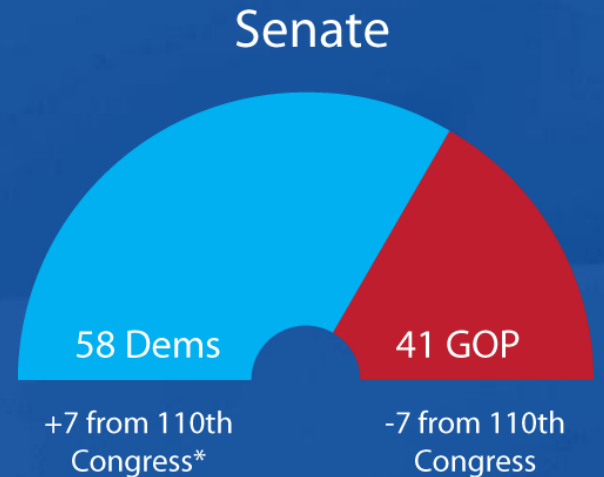
- 42 community college nuclear partnership programs
- 16 state-based work force development initiatives
- 500 percent increase since 1999 in nuclear engineering enrollment

Politics and Policy: The Year Ahead



A New Political Environment

- Increased Democratic majority in both House and Senate
- Despite changes, still solid base of support for nuclear power
- House Energy & Commerce Committee: significantly more liberal



The New Secretary of Energy on Nuclear Power

“The first [priority] is to accelerate this loan guarantee program for several [new] nuclear reactors.”

“[N]uclear power ... is going to be an important part of our energy mix. It is 20 percent of our electricity generation today, but it is 70 percent of the carbon-free portion of electricity today. And it is baseload. So I think it is very important that we push ahead.”



*—Dr. Steven Chu during his
Senate confirmation hearing
Jan. 13, 2009*

Key Energy Priorities for the New Administration and Congress

- Green jobs
 - Nuclear sector expanding, not contracting
 - 15,000 new jobs created
- More energy efficiency and renewables
 - Significant new baseload capacity still required
- Climate change
 - Analysis of all major climate change legislation requires nuclear expansion

Key Nuclear Energy Priorities

- Sustained, safe, reliable operation of current fleet
- New plants
 - Predictable licensing
 - Financing
- Used fuel management

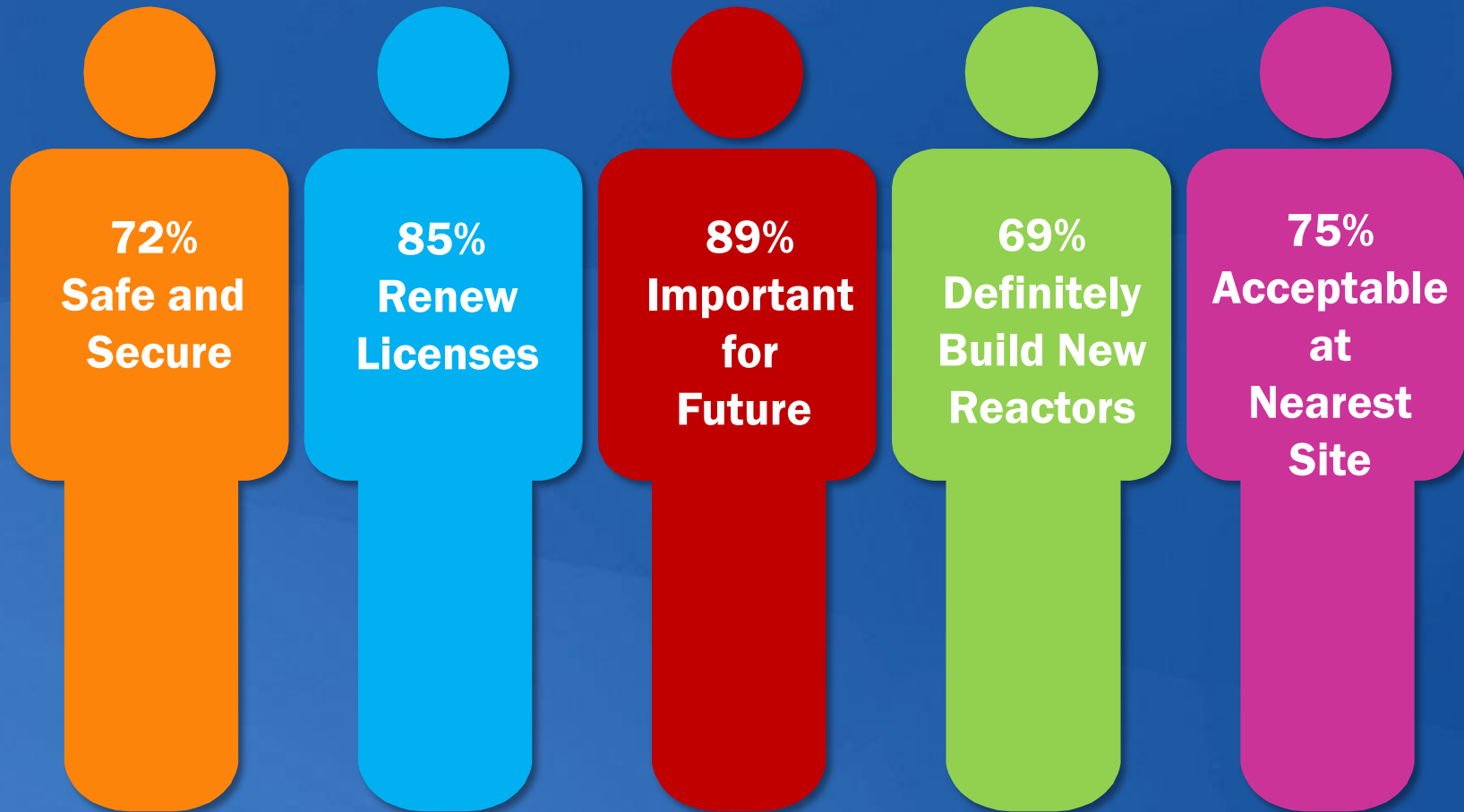


A Reasoned Approach to Used Fuel Management

- Three-part strategy
 - Long-term technology development to recycle nuclear fuel
 - Eventually ... permanent disposal facility
 - Interim storage
- Create “blue ribbon” commission to conduct reasoned reassessment of the government’s program



Strong Public Support Continues



The New Politics of Nuclear Energy

- State and local government officials, business leaders
- Organized labor
- Organized grassroots organizations (CASEnergy Coalition)
- State coalitions
- Nuclear industry employees
- New alliances



The Value Proposition

- Operating plants are safe, reliable and profitable
- New plants are financeable and profitable, particularly in a carbon-constrained world
- New nuclear plant construction will contribute significantly to President Obama's top priorities:
 - Jobs
 - Climate change
 - Energy security

Nuclear Energy 2009
**In Turbulent Times,
Still a Solid Value**

February 12, 2009