Nuclear Energy

Clean Electricity for America

Nuclear Energy Institute

Marshall Cohen
Senior Director, State and Local Government Affairs

June 2009

NUCLEAR ENERGY INSTITUTE

NEI Mission/Objectives

- Ensure the formation of policies that promote beneficial uses of nuclear energy and technologies
- Develop policy on key legislative and regulatory issues affecting the industry
- Provide a unified industry voice
- Provide a forum to resolve technical, regulatory and business issues for the nuclear business

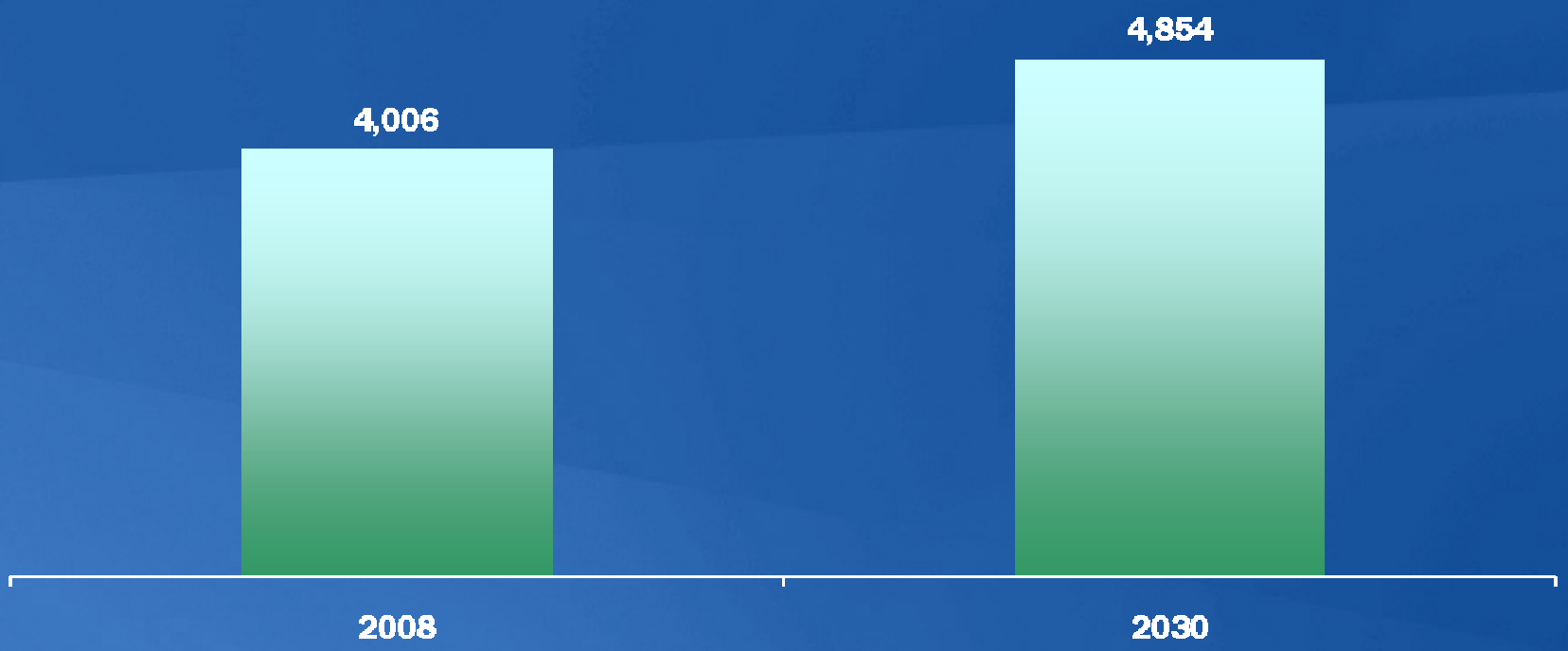
NEI's Members

Over 340 Member Companies

- All U.S. nuclear utilities
- International nuclear utilities
- Plant designers
- Architect/engineering firms
- Consulting/service
- Manufacturers/Fuel suppliers
- Radiopharmaceuticals
- Universities
- Labor unions
- Law firms

Projected U.S. Electricity Demand

(billion kilowatt-hours)



Source: Energy Information Administration Annual Energy Outlook 2008

Updated: 12/08

Today's Briefing

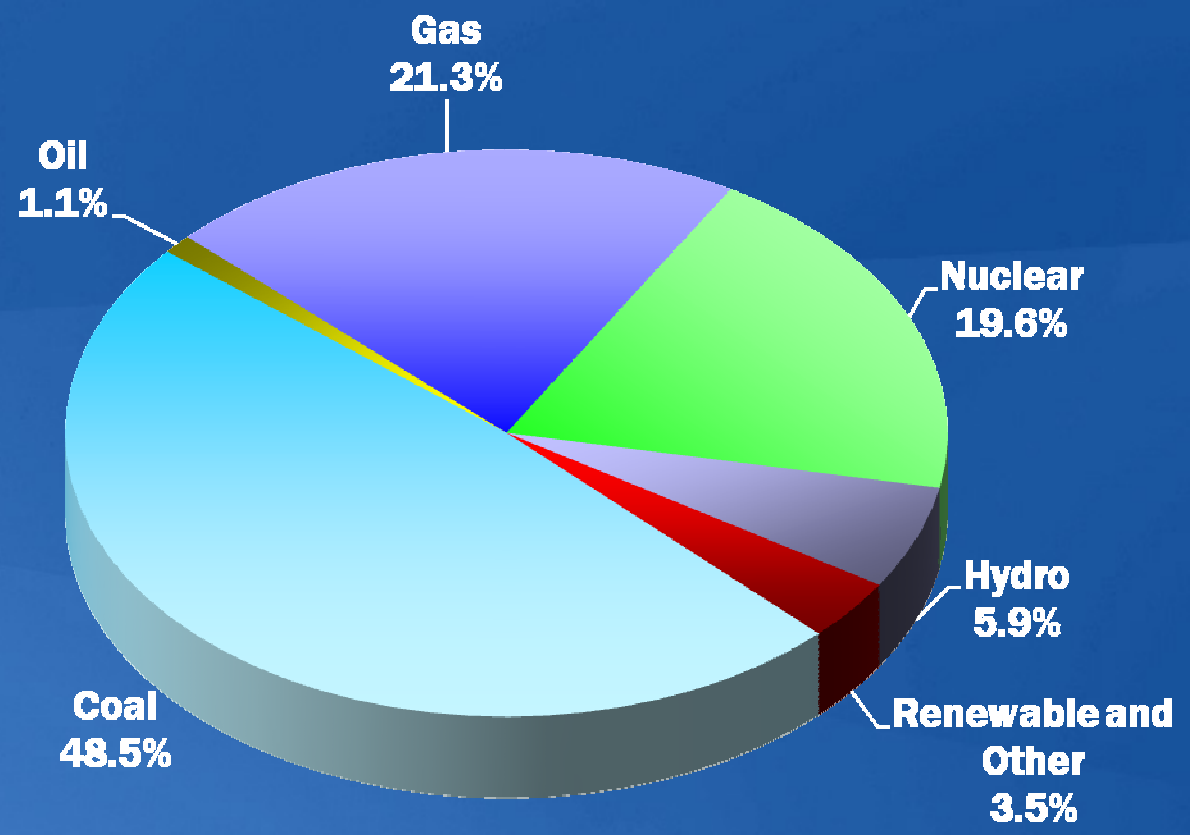
- Nuclear Energy Today: Review Operating Performance
- New Nuclear Plants: Progress and Expectations
- Politics and Policy

Review of Operating Performance

NUCLEAR ENERGY INSTITUTE

U.S. Electricity Generation

(2008)



Source: Energy Information Administration

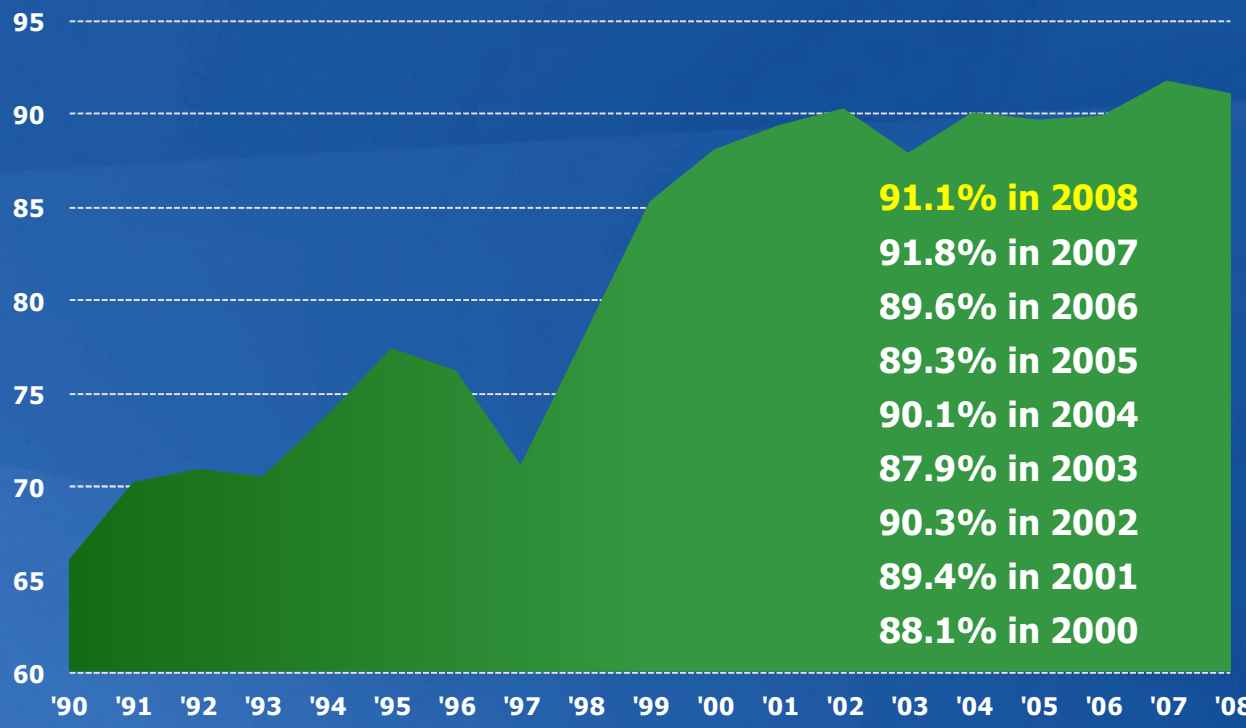
Updated: 4/09

Sustained Reliability

U.S. Nuclear Plant Average Capacity Factor

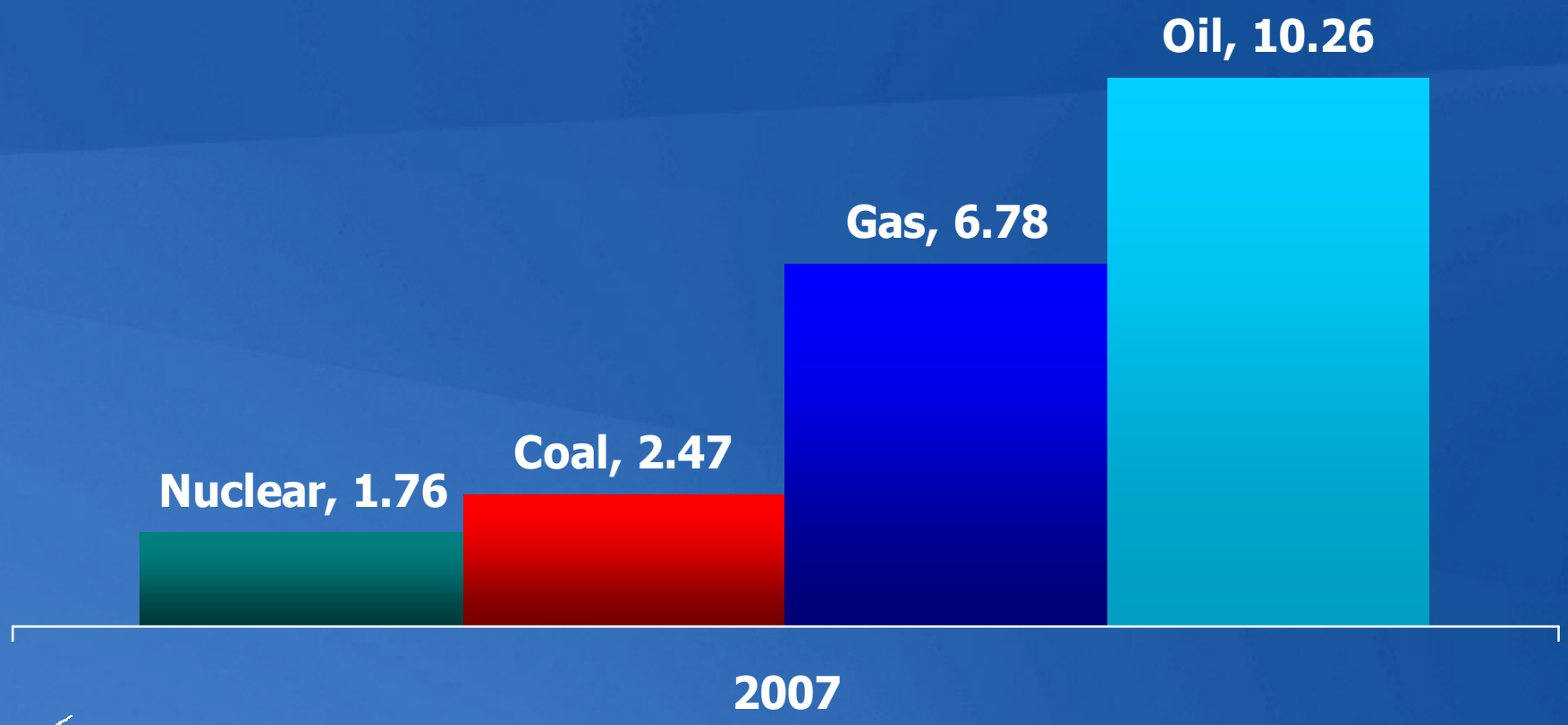
Highlights

- 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

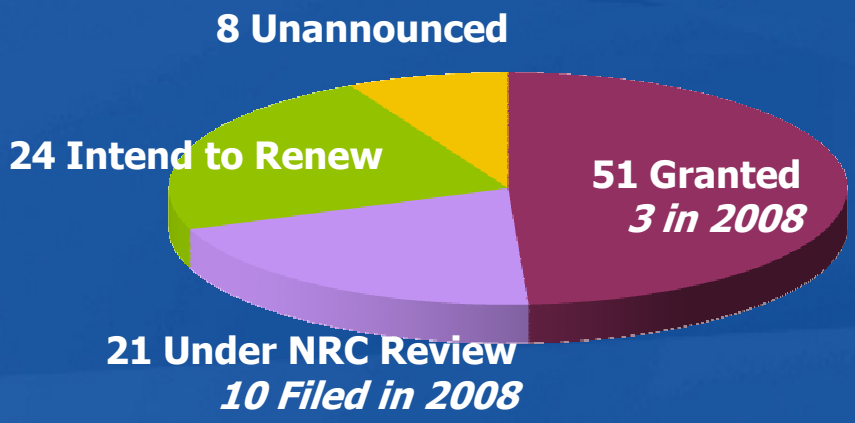
Nuclear Energy is the Lowest Cost Producer of Electricity Among Major Energy Sources (cents/kWh)



Production Costs = Operations and Maintenance Costs + Fuel Costs
Source: Global Energy Decisions

Other Key Highlights From 2008

License Renewals Continue ...



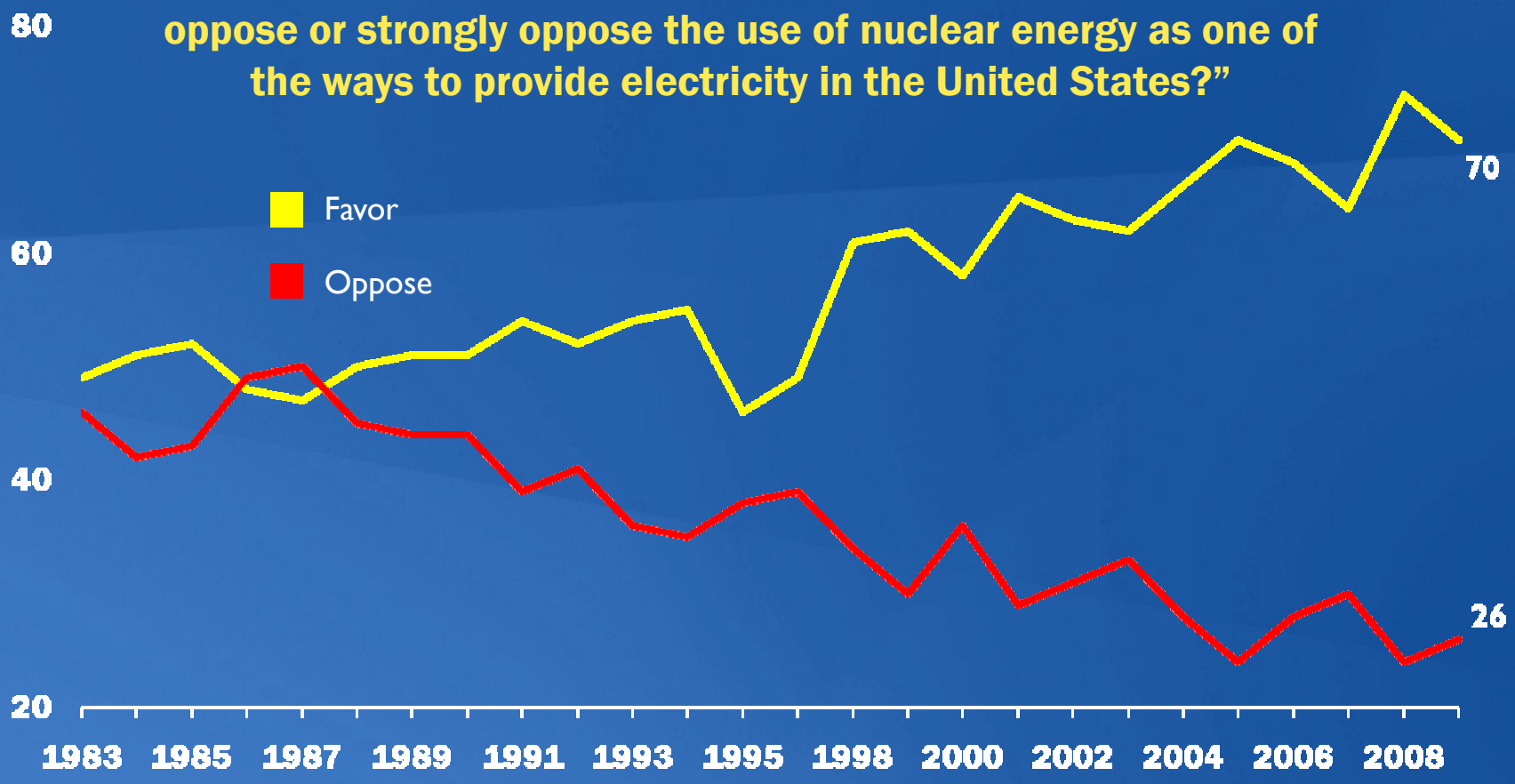
Source: U.S. Nuclear Regulatory Commission

... 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

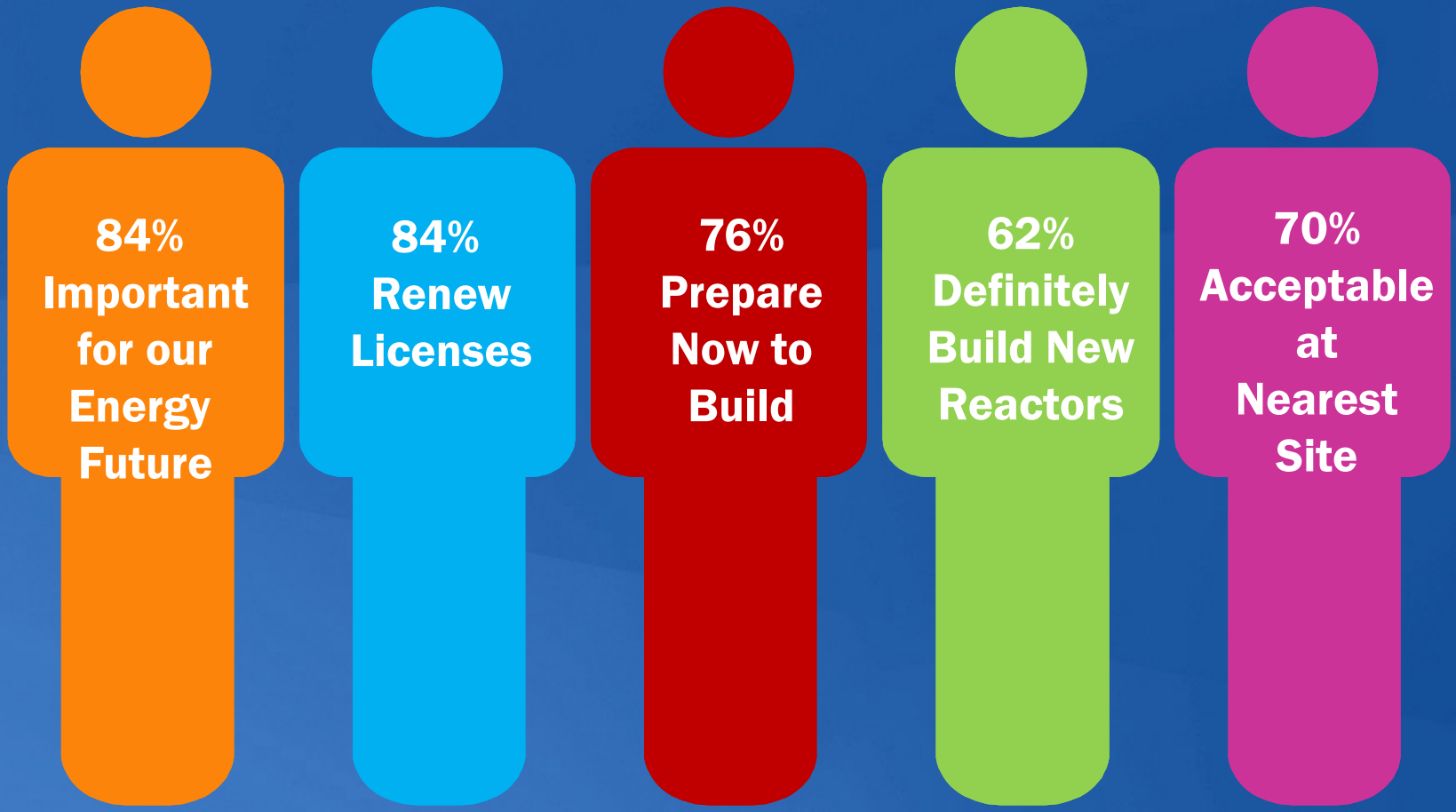
Upward Trend in Public Support For Nuclear Energy

"Overall, do you strongly favor, somewhat favor, somewhat oppose or strongly oppose the use of nuclear energy as one of the ways to provide electricity in the United States?"



Source: Bisconti Research Inc./GfK, March 2009, 1,000 U.S. Adults

Strong Public Support Continues

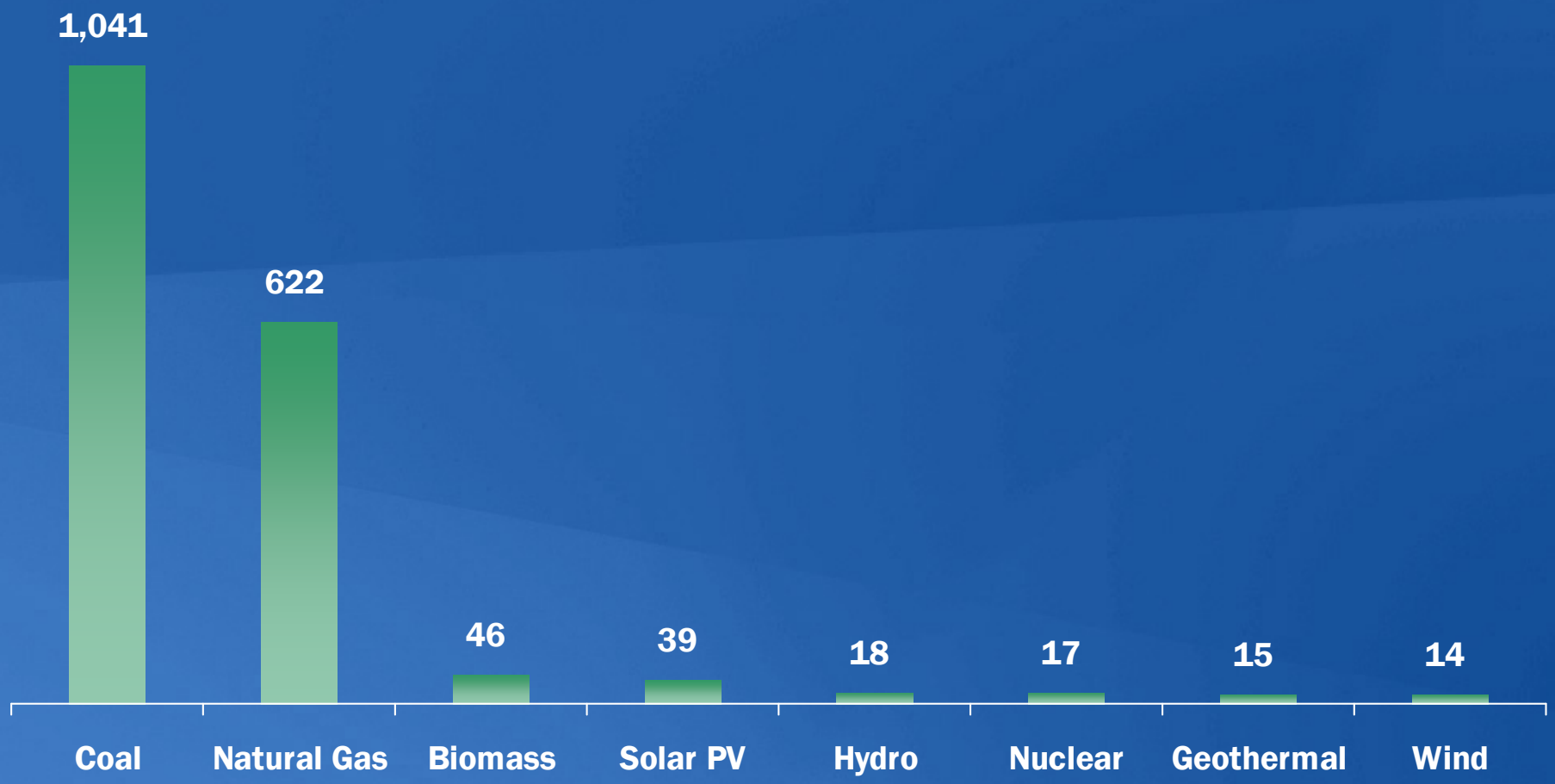


Source: Bisconti Research Inc.

March 2009 poll of 1,000 U.S. adults; margin of error is +/- 3%

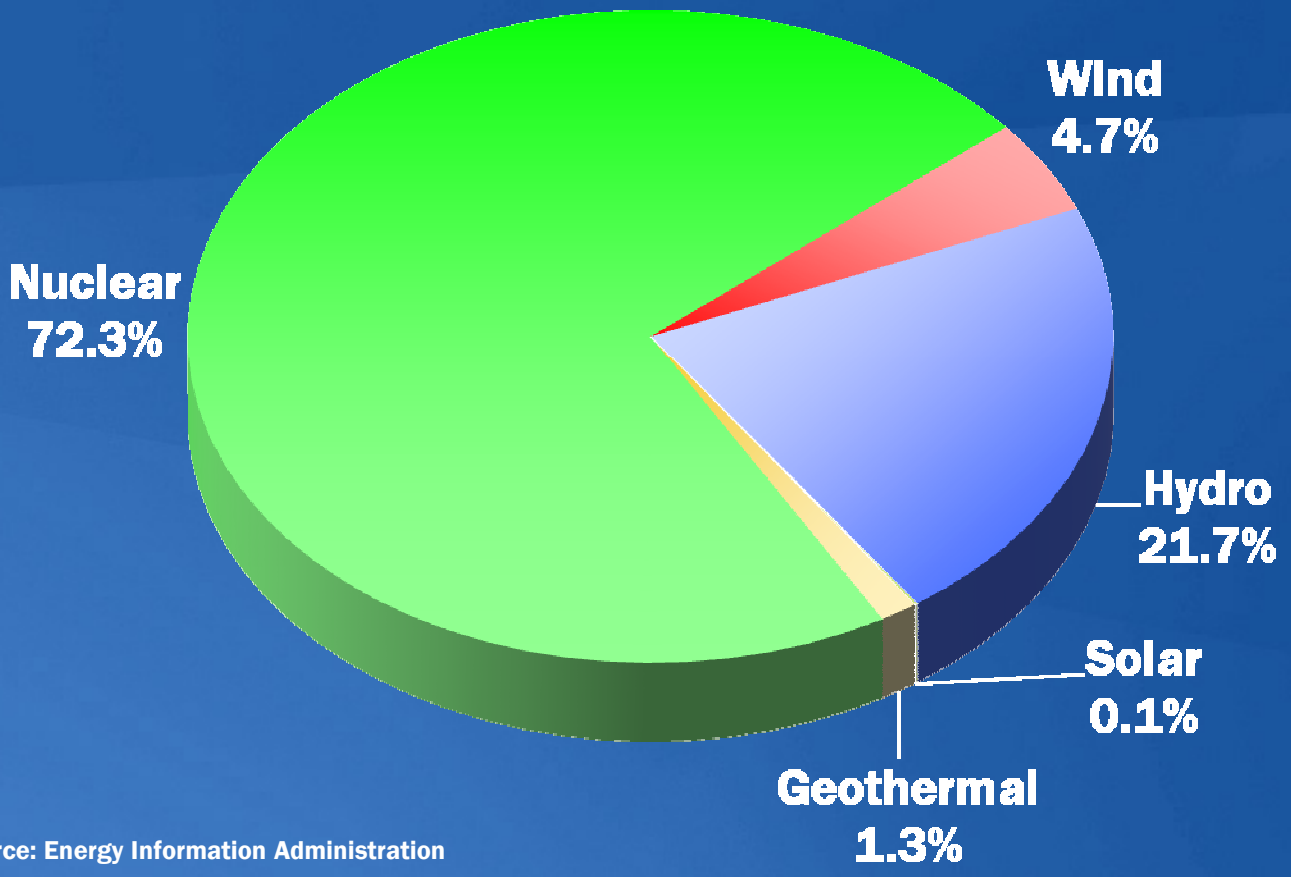
Comparison of Life-Cycle Emissions

Tons of Carbon Dioxide Equivalent per Gigawatt-Hour



Source: "Life-Cycle Assessment of Electricity Generation Systems and Applications for Climate Change Policy Analysis," Paul J. Meier, University of Wisconsin-Madison, August 2002.

U.S. Electricity Sources Which Do Not Emit Greenhouse Gases During Operation (2008)

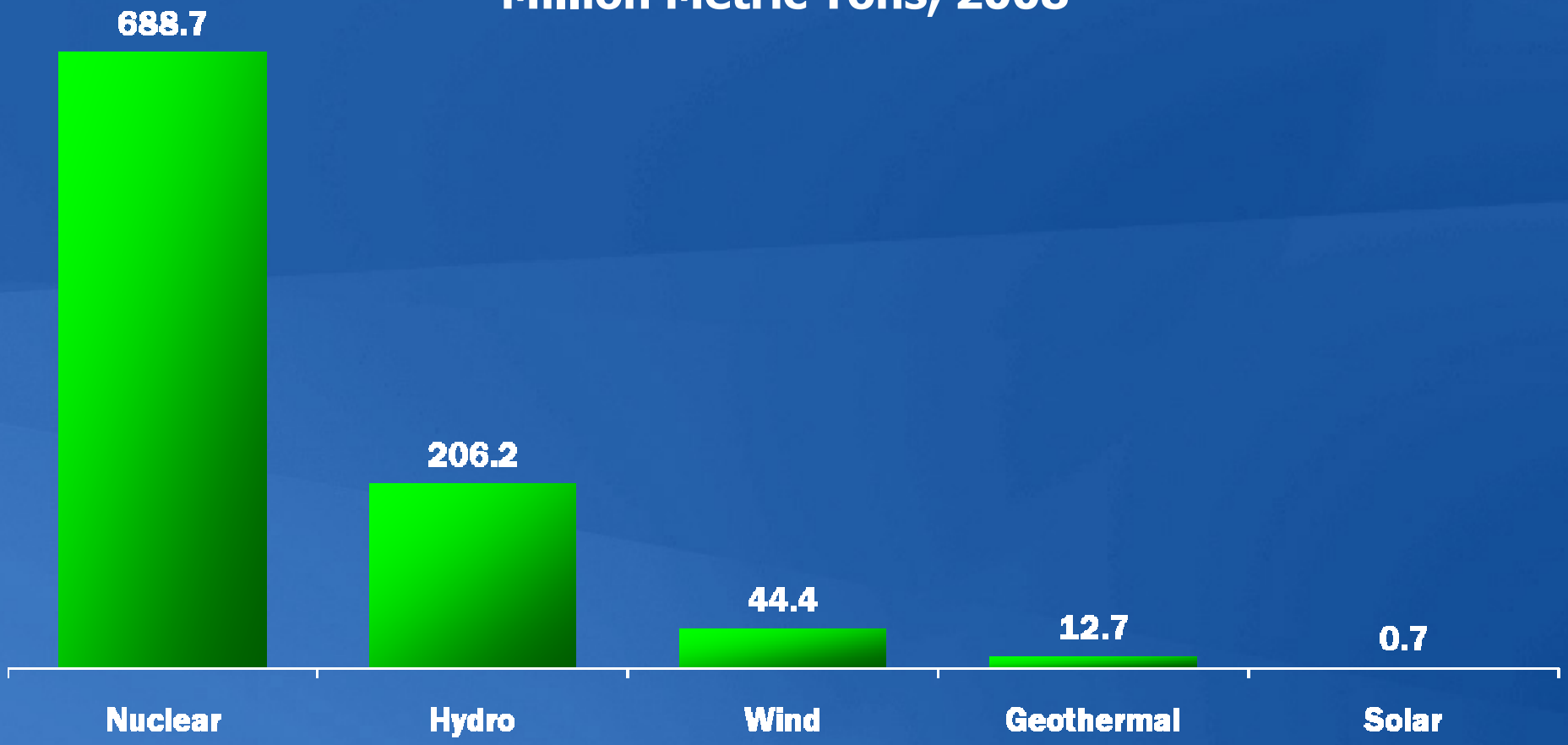


Source: Energy Information Administration

Updated: 4/09

U.S. Electric Power Industry CO_2 Avoided

Million Metric Tons, 2008

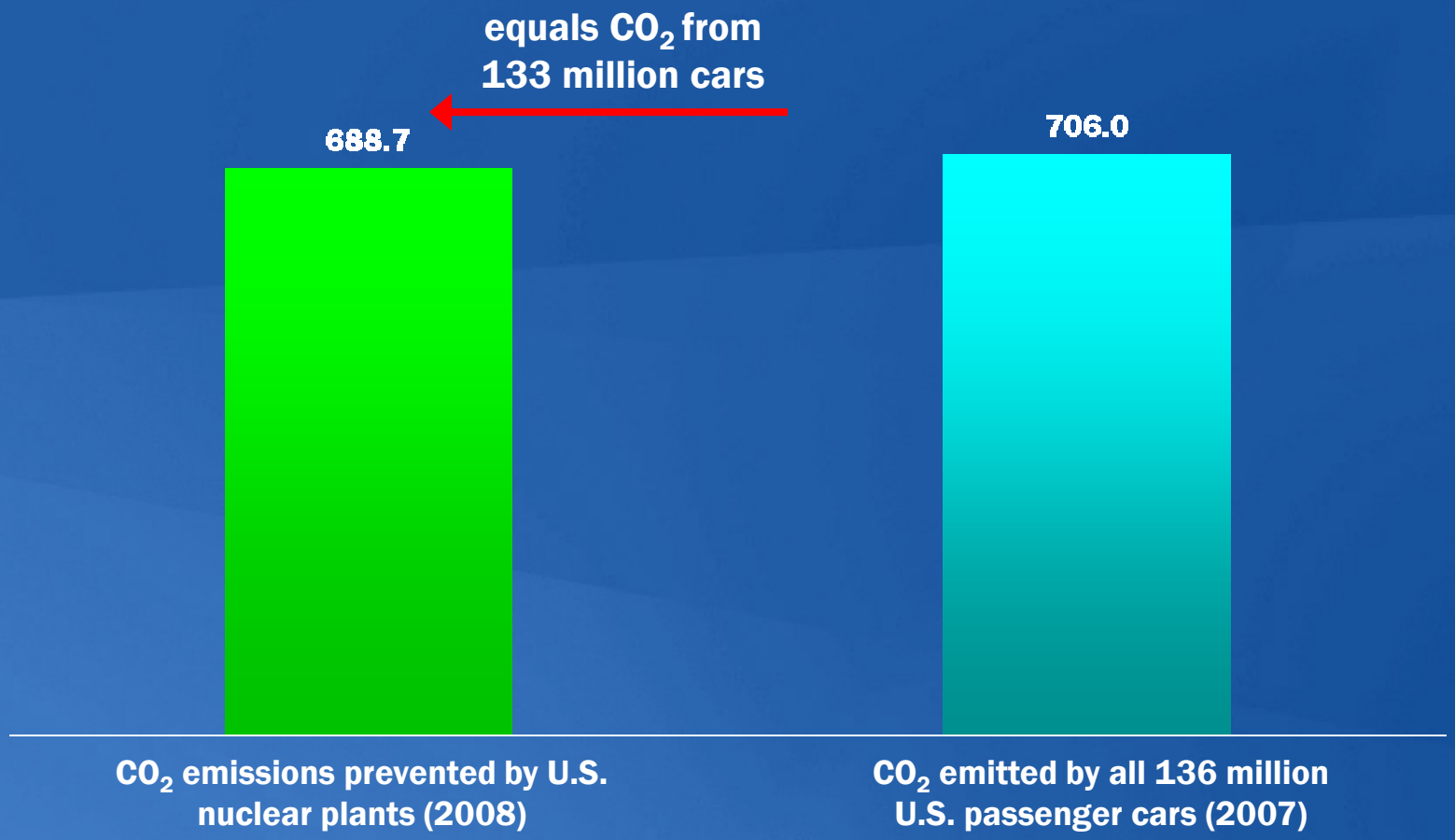


Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the Environmental Protection Agency and plant generation data from the Energy Information Administration.

Updated: 5/09

Perspective on CO_2 Emissions Prevented By U.S. Nuclear Plants

Million Metric Tons, 2008



Source: Emissions avoided by nuclear power are calculated using regional fossil fuel emission rates from the Environmental Protection Agency and plant generation data from the Energy Information Administration. Car emissions from EPA, Office of Transportation and Air Quality Emissions Facts (April 2000).
Updated: 5/09

New Nuclear Plants: Progress and Expectations

NUCLEAR ENERGY INSTITUTE

Scholarly Research & Analysis

Nuclear Energy Is An Indispensable Part of Energy Portfolio

- International Energy Agency
- Pacific Northwest National Laboratory
- McKinsey & Company
- Cambridge Energy Research Associates
- DOE Energy Information Administration
- Electric Power Research Institute

NEWS

THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine

NATIONAL ACADEMY OF SCIENCES • NATIONAL ACADEMY OF ENGINEERING • INSTITUTE OF MEDICINE • NATIONAL RESEARCH COUNCIL

Joint Science Academies' Statement: Climate Change Adaptation and the Transition to a Low Carbon Society (2008)

The transition to a low carbon society requires: setting standards; designing economic instruments and promoting energy efficiency across all sectors encouraging changes in individual behavior . . . and investing strongly in carbon-removing technologies and low-carbon energy resources: ***nuclear*** *power, solar energy, hydroelectricity and other renewable energy sources.*

NEI

Short-Term Outlook to 2020

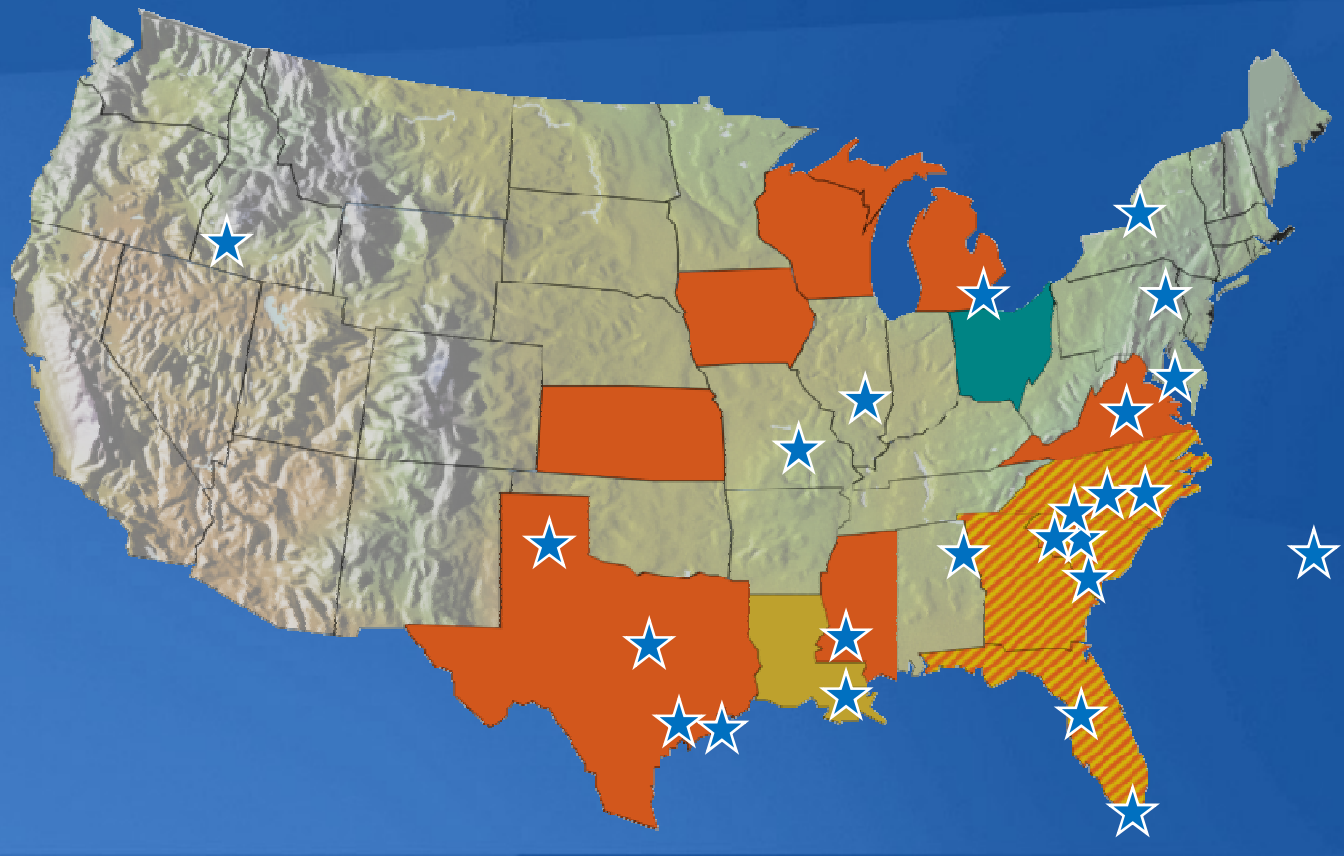
- First wave (4 to 8 reactors) expected to start commercial operation 2016
- Potential for 15 to 18 new nuclear reactor plants on-line by 2020
- Build rate and number of plants will depend on success of first wave

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
  - Clean Energy Deployment Administration (CEDA)

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



- Potential location for new nuclear plant

NEI

U.S. Manufacturers Ramping Up

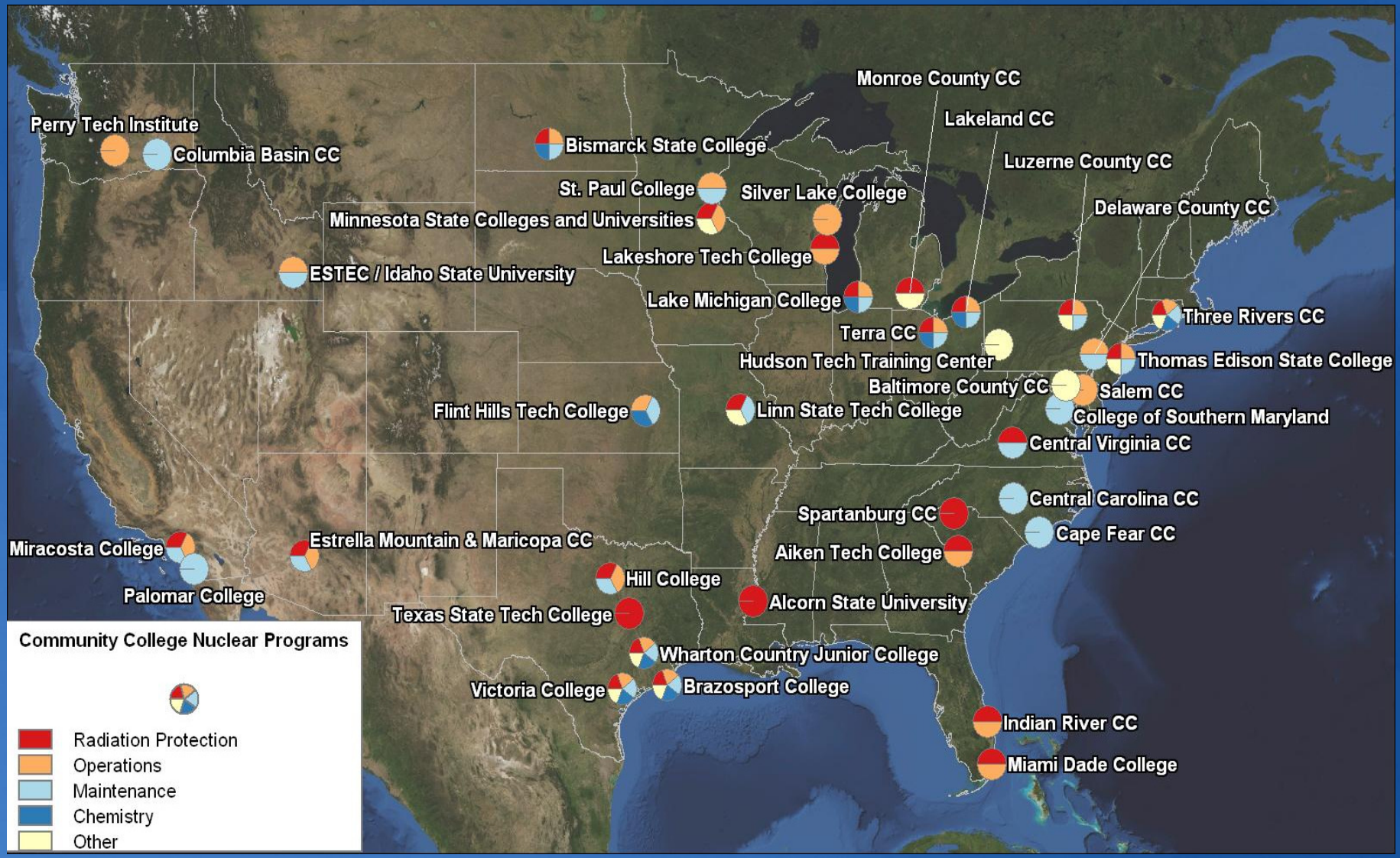
Supply Chain and Fuel Supply Expansion Plans

- 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.

Nuclear Power Work Force Current Status

- 35 percent of employees are eligible for retirement by 2012
- Growing demand for skilled workers
  - $1.5 trillion in energy infrastructure by 2020
- Nuclear industry supporting more than 46 different community college programs
- More than 21 state-based workforce development efforts are underway

Partnered Nuclear Community College Programs



Nuclear Energy Career Benefits

- Salary
  - Mechanical Technician - $66,500/yr
  - Electrical Technician - $67,500/yr
  - I&C Technician - $72,300/yr
  - Radiation Protection Technician - $69,000/yr
  - Non-licensed Operators - $70,800/yr
- Benefits
  - Medical, Dental, 401Ks, Pensions, Educational Reimbursement and Maternity Leave are common
- Training
  - All employees have access to company based technical training to increase the knowledge and skills of the employees
  - Extensive training is delivered to all employees before being fully qualified

Work Force Development Grants

- 2008 Grant Results
  - NRC Education Assistance Program ($15 M total)
    - 6 Community College grants for $734,971 total
  - DOL President's High Job Growth Training Initiative—Energy and Construction ($10 M total)
    - 4 grants for $3,977,899
- 2009 Grant Results
  - $5.5 M in DOL grants awarded in January 2009
    - 2 pilot teams for the uniform curriculum program
    - Work force to build and staff Piketon facility
  - Grants are currently submitted for 2009 NRC opportunities
  - Stimulus Bill included $45 M in nuclear education to be split between NRC/DOE/NSSA

Politics and Policy

NUCLEAR ENERGY INSTITUTE

A New Political Environment

- New Administration
- Increased Democratic majority in both House and Senate
- Good base of support for nuclear power
- New Nuclear Advocates always needed

The New Secretary of Energy on Nuclear Power

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

"Nuclear 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

House Energy Bill

- House Energy and Commerce Committee voted 33-25 May 21 to approve the Clean Energy and Security Act
- Aims to cut U.S. greenhouse gases that contribute to global warming by 17 percent below 2005 levels by 2020 and by 83 percent by 2050 and requires utilities generate 15 percent of their electricity supplies from renewable energy sources by 2020
- Creates Clean Energy Deployment Administration (CEDA) that provides support for the deployment of clean energy technologies, including loans, loan guarantees and other credit enhancements
- Allows generation from new nuclear power plants to be subtracted from the baseline amount of utility power sales against which the renewable energy increases are measured

Senate Energy Bill

- Senate Energy and Natural Resources Committee approved on June 17th an energy bill that would boost renewable energy use, expand use of nuclear energy and offshore oil and gas drilling
- Mandate imposed on utilities to generate least 15 percent of their energy from renewable sources by 2021
- New manufacturing and building efficiency standards
- Clean Energy Deployment Administration to finance renewable energy technology
- Blue-ribbon commission to study long-term storage of nuclear waste.

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

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

Thank You.

Questions?

MC@Nei.org

NUCLEAR ENERGY INSTITUTE