

Greening the Grid with America's Nuclear Power Plants



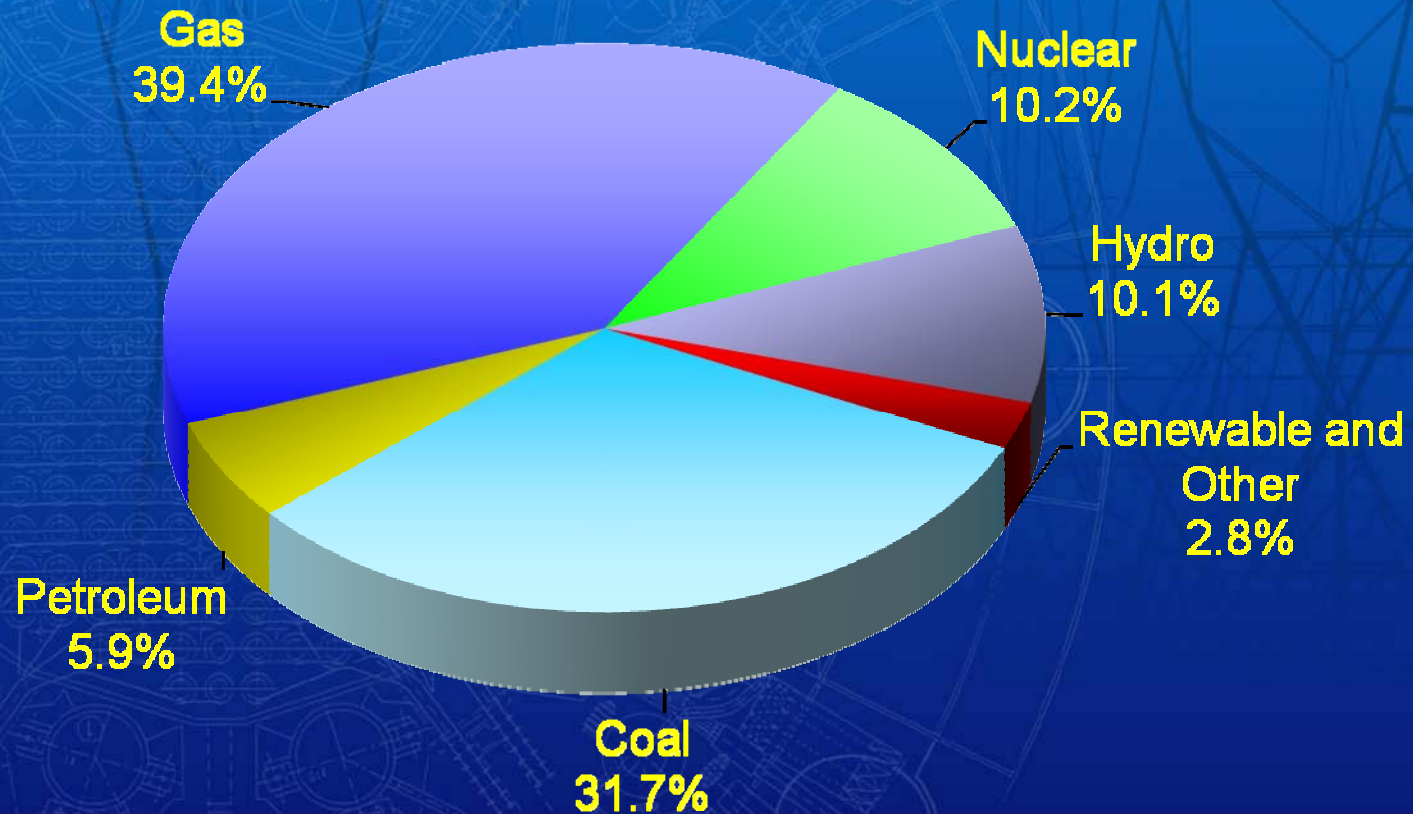
NUCLEAR ENERGY INSTITUTE



Overview

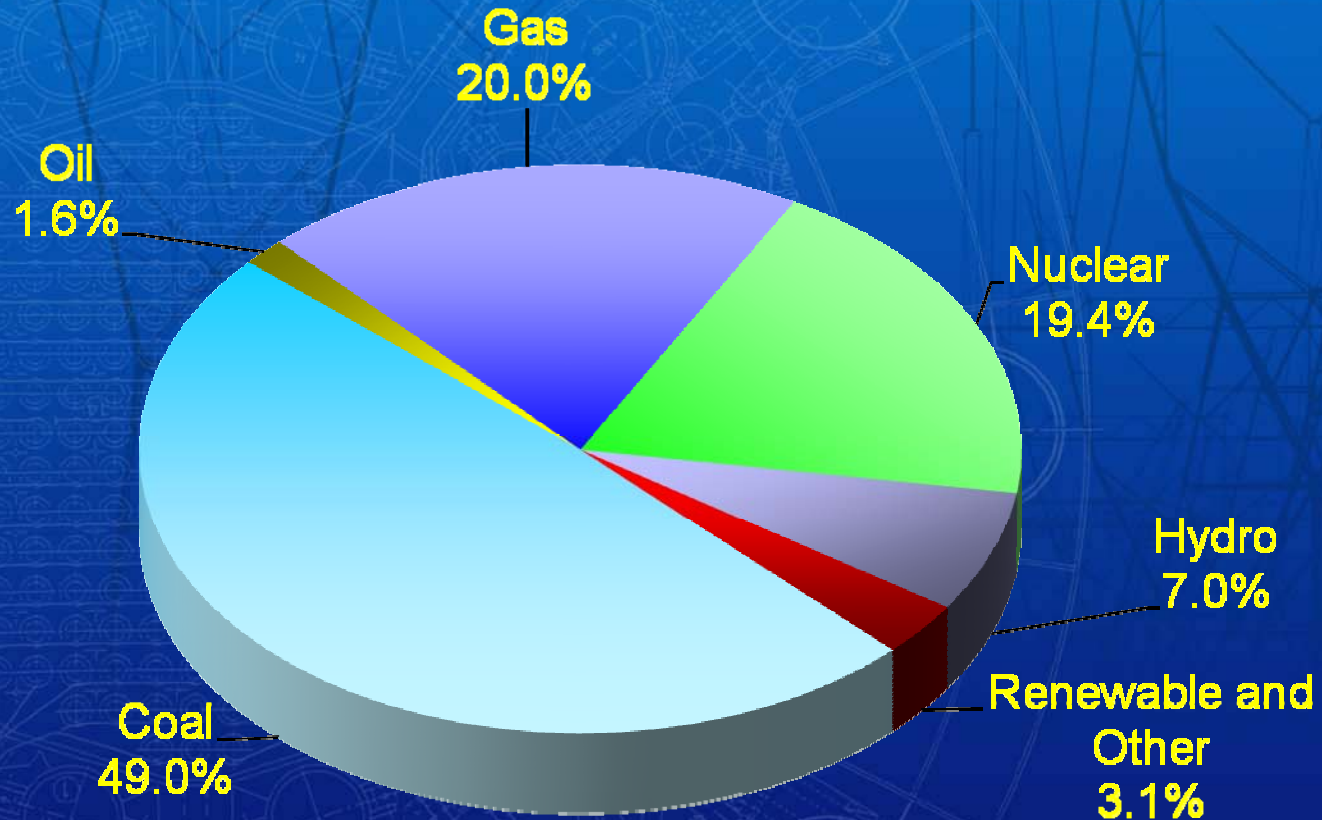
- **Nuclear today, environmental and energy security perspectives**
- **Growing support for new plants**
 - **Public, environmental & political**
- **Emerging low-carbon synergies combining nuclear/renewable/fossil**

U.S. Total Generating Capacity 2006



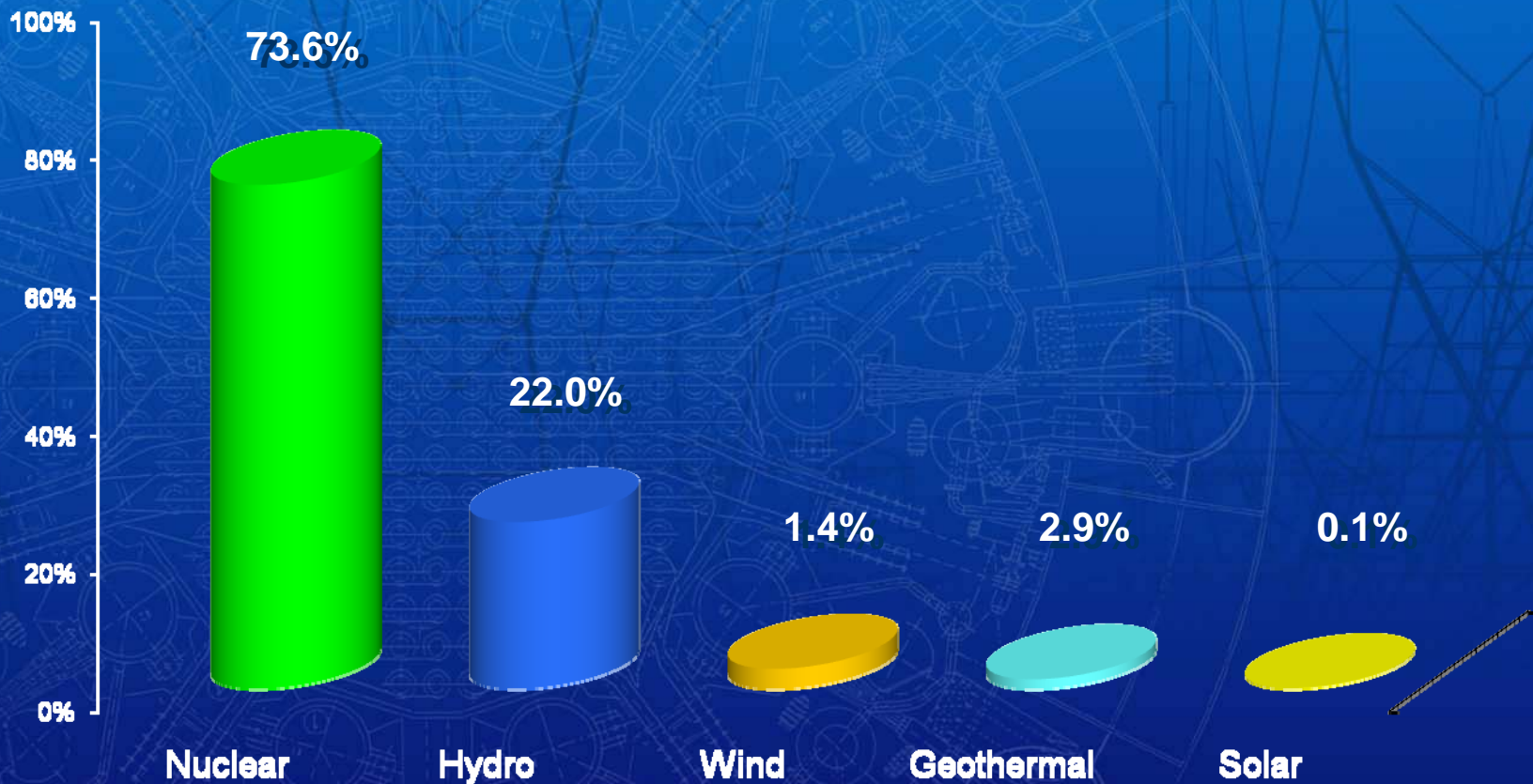
Source: Global Energy Decisions / Energy Information Administration
Updated: 10/07

U.S. Electricity Generation Fuel Shares 2006



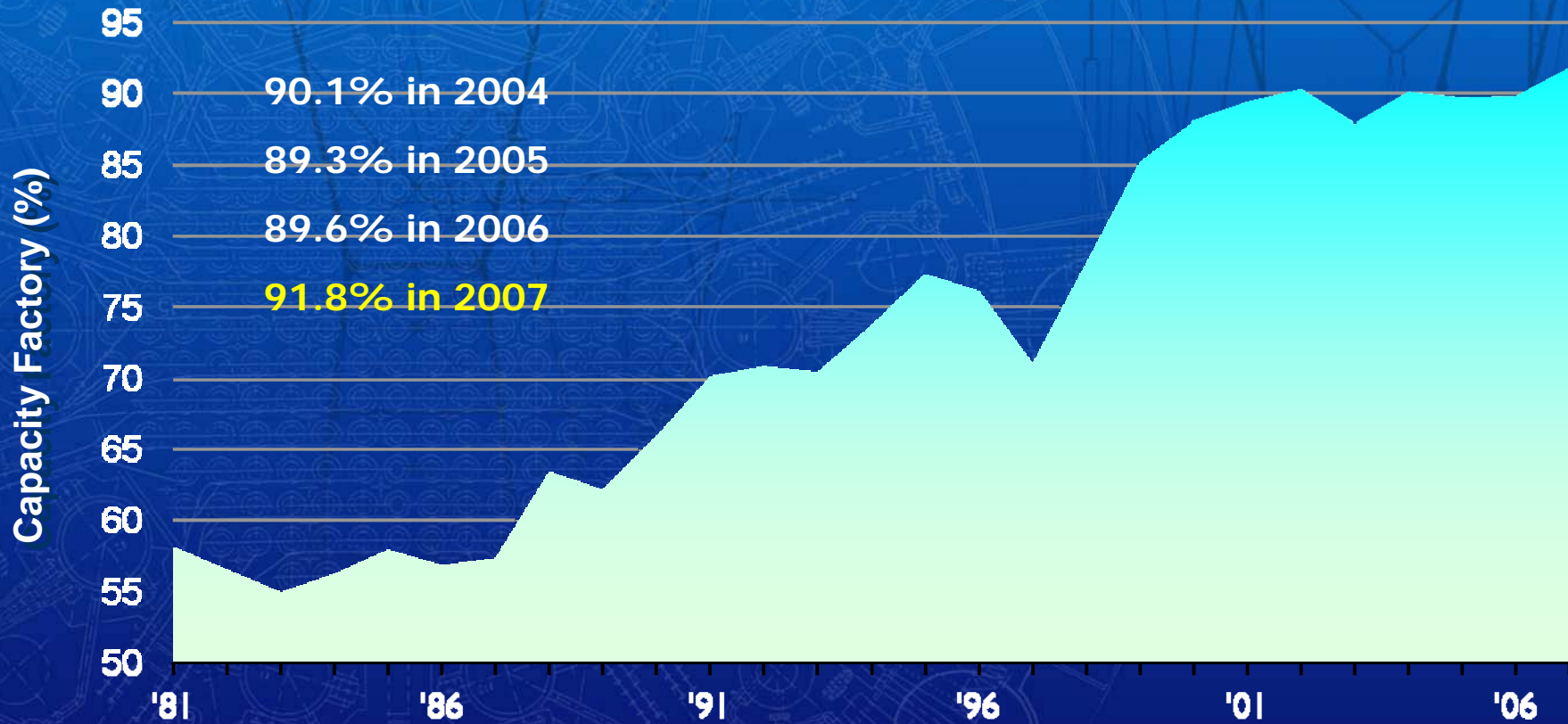
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Emission-Free Sources Of Electricity



Industry Performance Is Consistently Excellent

U.S. Nuclear Capacity Factor, Percent

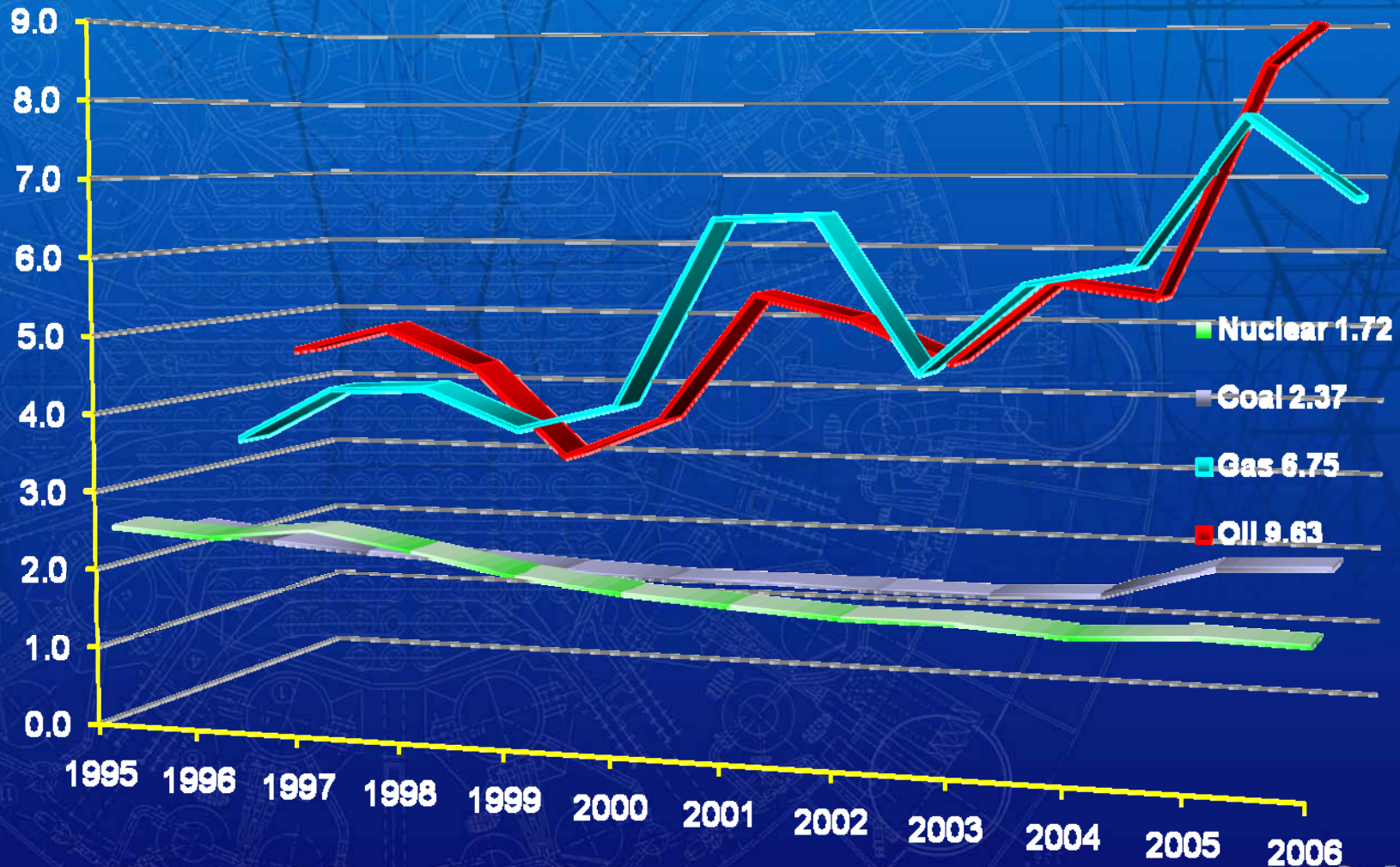


Source: Energy Information Administration



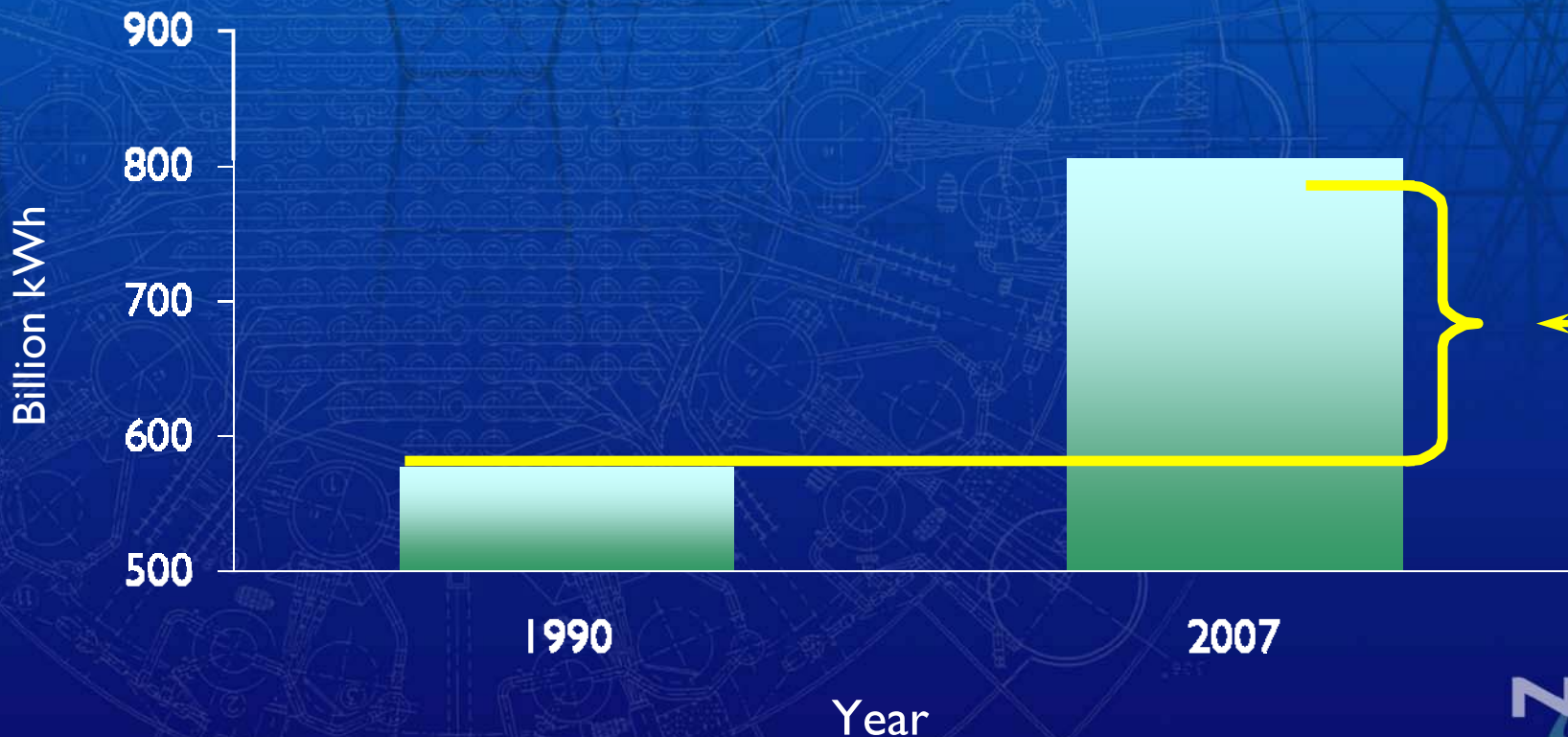
U.S. Electricity Production Costs

(in constant 2006 cents/kWh)

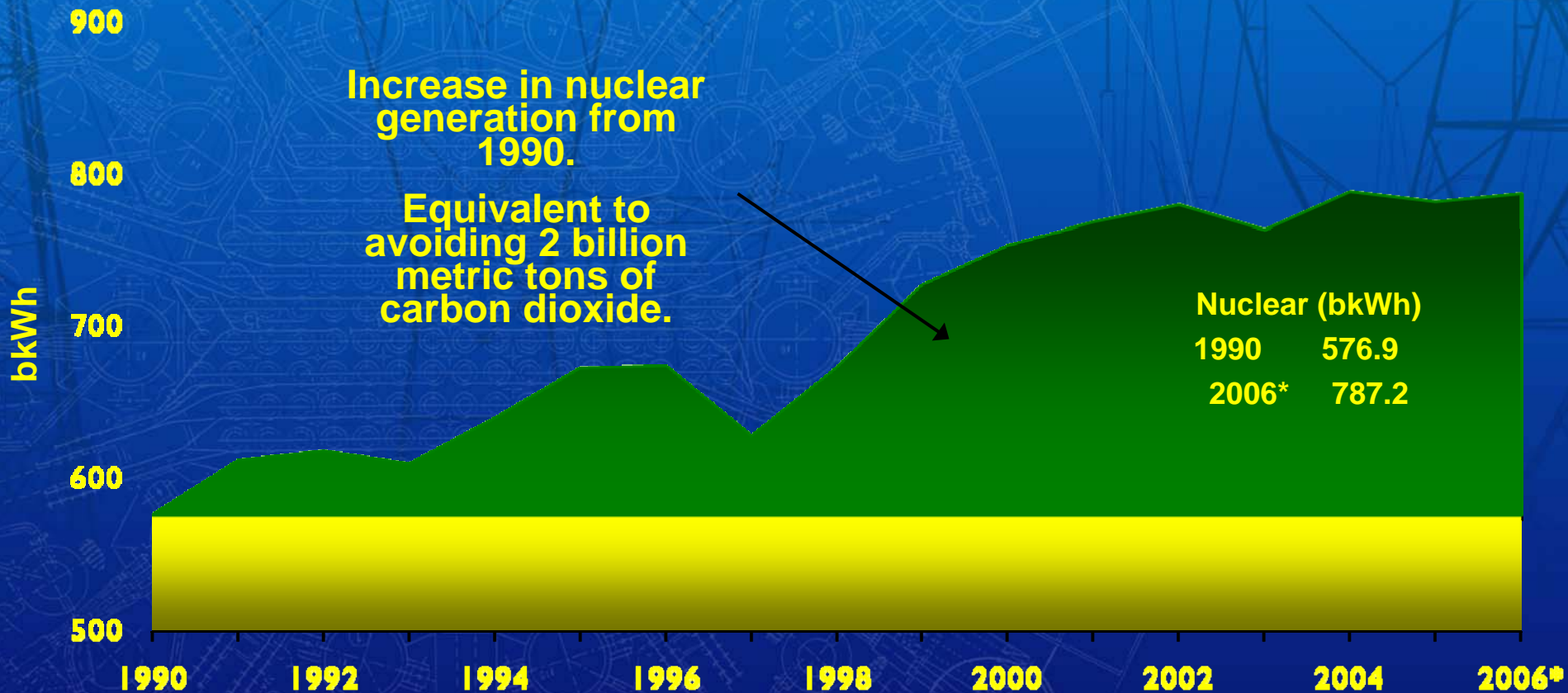


Growth in Nuclear Plant Output: 1990 – 2007

Equivalent to 29 new 1,000-megawatt power plants



U.S. Nuclear Industry Net Electricity Generation and Avoided Emissions 1990-2006



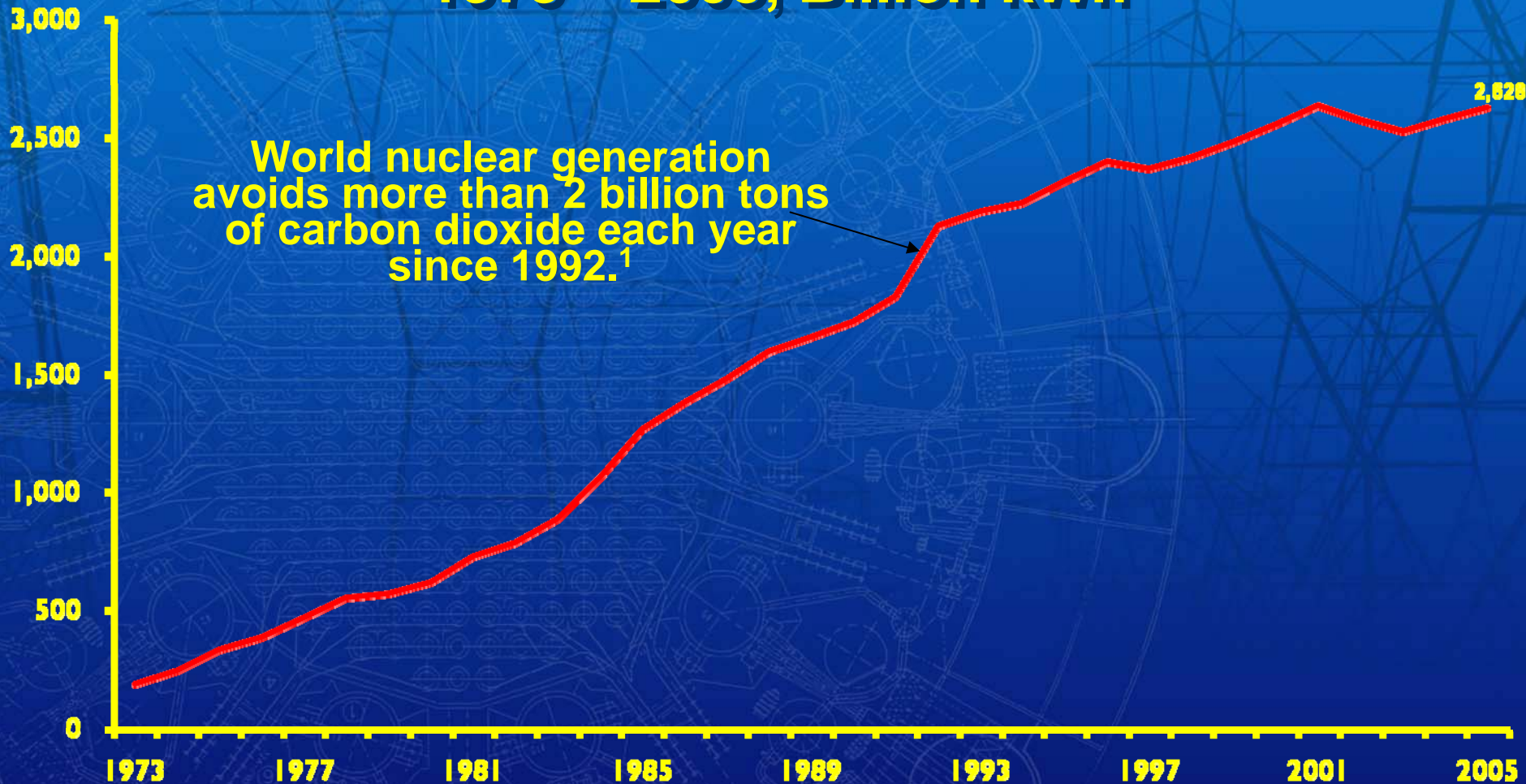
* Preliminary

Source: Global Energy Decisions / Energy Information Administration

Updated: 4/07



World Nuclear Generation 1973 – 2005, Billion kWh



Source: International Atomic Energy Agency

¹One billion kWh from nuclear avoids about one million tons of carbon dioxide.

Updated: 6/06



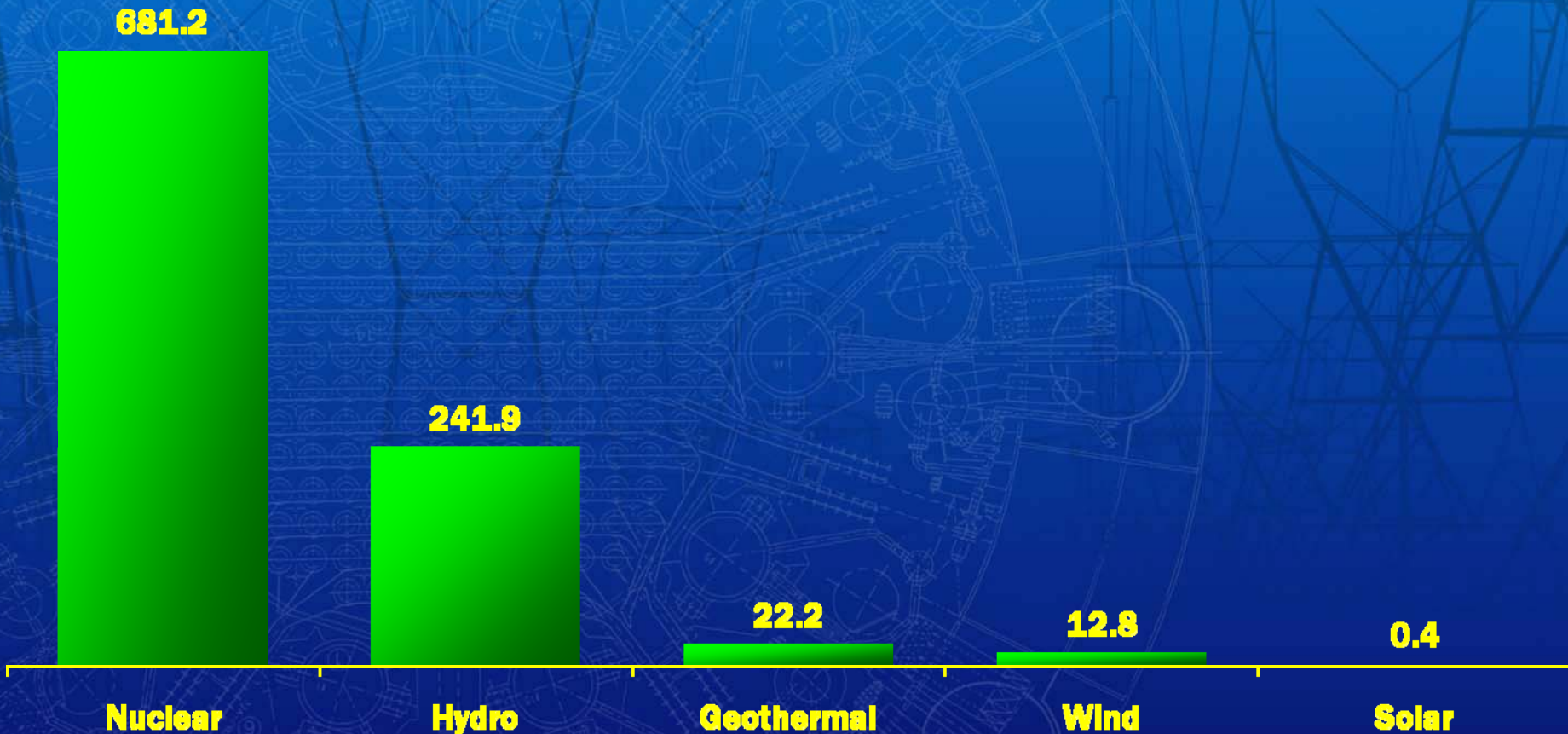
Emissions Reductions in Perspective

- The UNFCCC estimates that the Kyoto Protocol's Clean Development Mechanism (CDM) will generate 1.2 billion tons of emission reductions by the end of 2012
- Worldwide, nuclear power avoids the emissions of around 2.6 billion tons of CO₂ annually

Source: UNFCCC CDM Statistics (<http://cdm.unfccc.int/statistics>) and International Energy Agency. Emissions avoided by nuclear power are calculated using an average fossil fuel emissions rate that is weighted by the ratio of projected coal and gas generation.

U.S. Electric Power Industry CO₂ Avoided

Million Metric Tons, 2006



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: 4/07

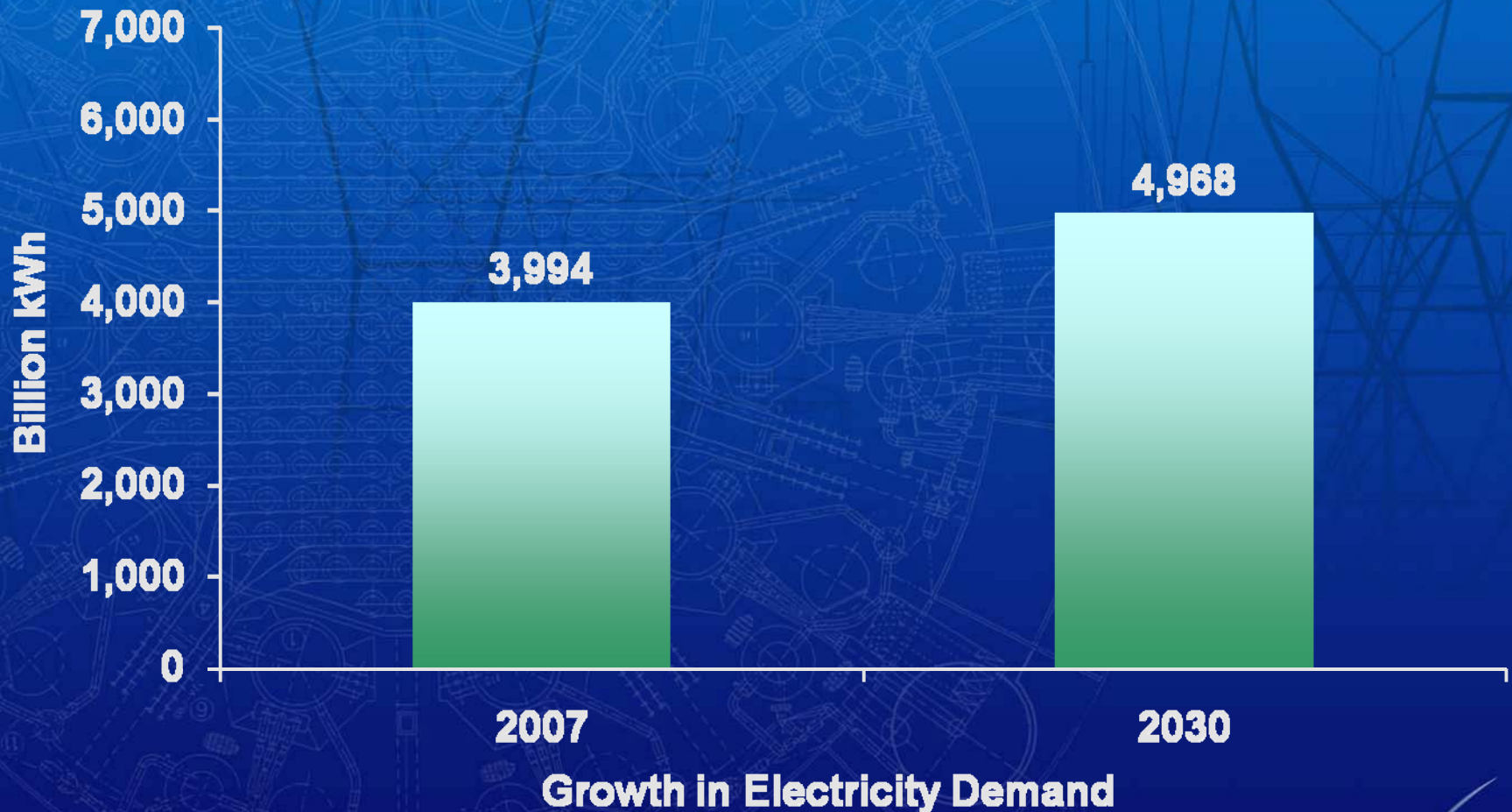
Comparison of Life-Cycle Emissions

1,041 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. Needs 25 Percent More Electricity By 2030



Source: Energy Information Administration



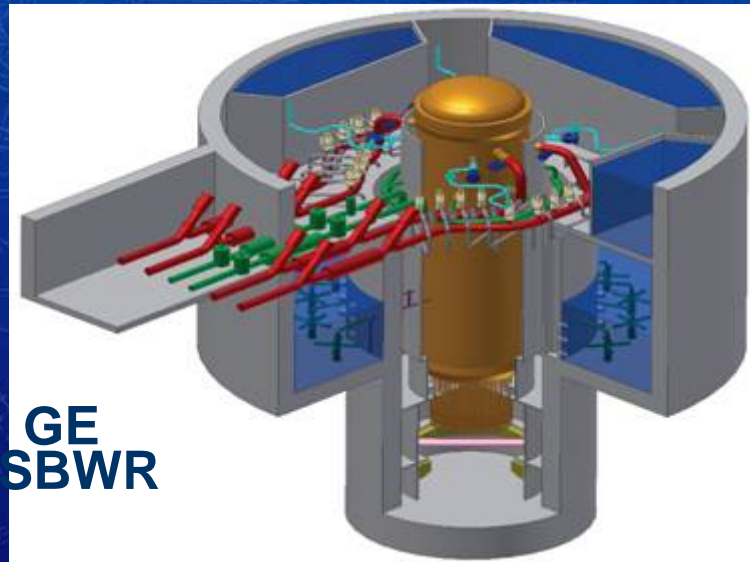
What's New ... Designs Under Consideration



AREVA
EPR



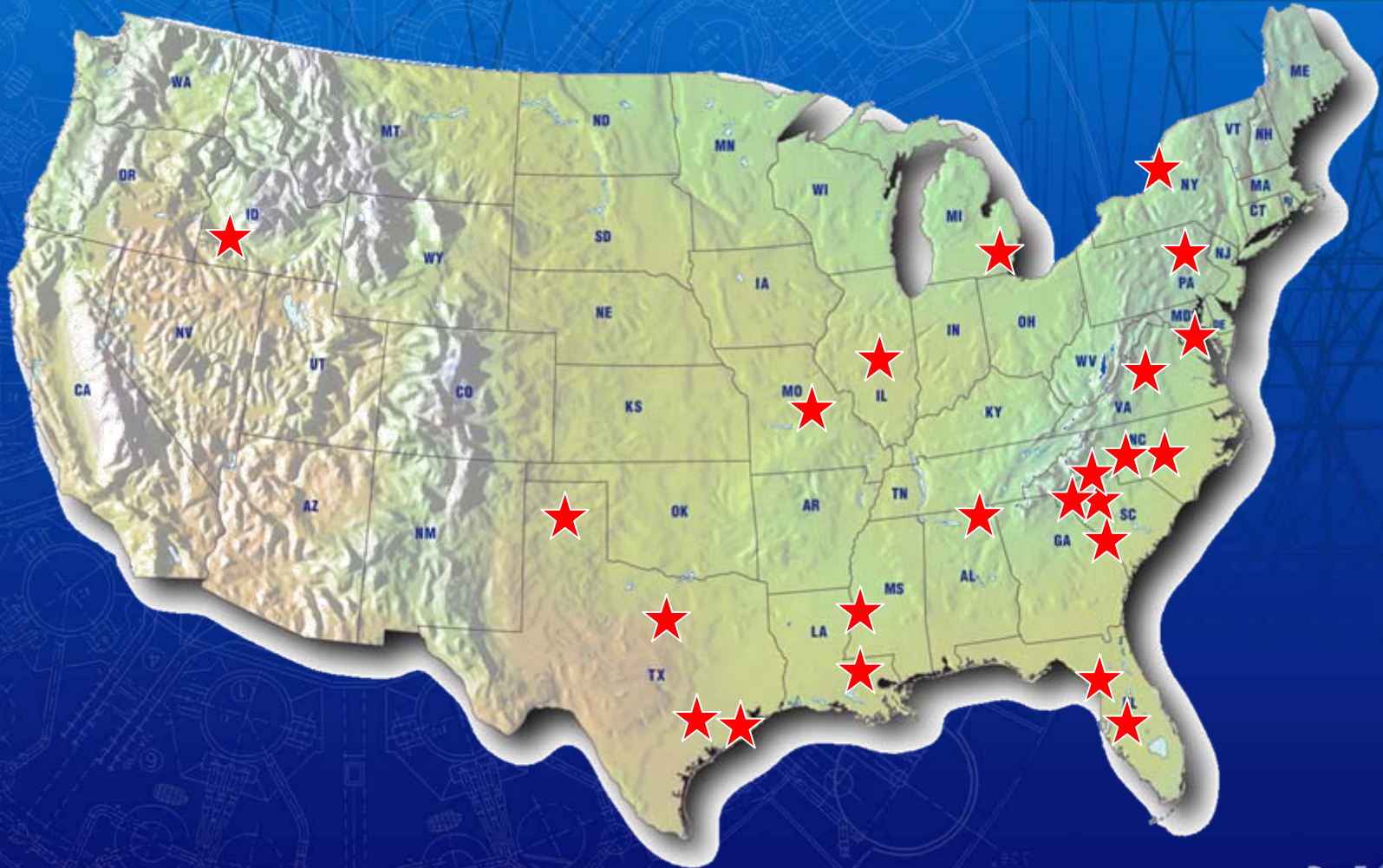
GE
ESBWR



Current Status: New Nuclear Deployment

- **12 license applications under review by Nuclear Regulatory Commission for a total of 20 new plants.**
- **Four new reactor resigns pre-certified**
- **Three environmental permits approved**

Potential Locations for New Nuclear Plants



New Nuclear Plants Under Consideration

Company	Location (Existing Plant)	ESP	Design (Units)	COL Submittal
Alternate Energy Holdings / Unistar	Elmore County, ID	Straight to COL	EPR (1)	FY 2009
Amarillo Power / Unistar	Vicinity of Amarillo, TX	Straight to COL	EPR (1)	FY 2009
AmerenUE / Unistar	Callaway County, MO (Callaway)	Straight to COL	EPR (1)	Under Review
Constellation / UniStar	Calvert County, MD (Calvert Cliffs)	Straight to COL	EPR (1)	Under Review
Constellation / UniStar	Oswego County, NY (Nine Mile Point)	Straight to COL	EPR (1)	FY 2009
Dominion	Louisa County, VA (North Anna)	Approved November 2007	ESBWR (1)	Under Review
DTE Energy	Fermi, MI (Fermi)	TBD	TBD	FY 2008
Duke	Oconee County, SC (Oconee)	Considering	TBD	TBD
Duke	Davie County, NC	Considering	TBD	TBD
Duke	Cherokee County, SC (Lee)	Straight to COL	AP1000 (2)	Under Review
Entergy	West Feliciana Parish, LA (River Bend)	Straight to COL	ESBWR (1)	FY 2008
Exelon	Victoria County, TX	Straight to COL	ESBWR (2)	Under Review

New Nuclear Plants Under Consideration

Company	Location (Existing Plant)	ESP	Design (Units)	COL Submittal
Exelon	Clinton, IL (Clinton)	Approved March 2007	TBD	TBD
Florida Power & Light	Miami-Dade County, FL (Turkey Point)	TBD	TBD	FY 2009
Luminant	Glen Rose, TX (Comanche Peak)	Straight to COL	APWR (2)	FY 2008
NRG/STPNOC	Matagorda County, TX (South Texas Project)	Straight to COL	ABWR (2)	Under Review
NuStart Energy (Energy)	Claiborne County, MS (Grand Gulf)	Approved April 2007	ESBWR (1)	Under Review
NuStart Energy (TVA)	Jackson County, AL (Bellefonte)	Straight to COL	AP1000 (2)	Under Review
PPL Corp. / Unistar	Luzerne County, PA (Susquehanna)	Straight to COL	EPR (1)	FY 2009
Progress Energy	Wake County, NC (Harris)	Straight to COL	AP1000 (2)	Under Review
Progress Energy	Levy County, FL	Straight to COL	AP1000 (2)	Under Review
South Carolina Electric & Gas	Fairfield County, SC (V.C. Summer)	Straight to COL	AP1000 (2)	Under Review
Southern Co.	Burke County, GA (Vogtle)	Approval expected 2009	AP1000 (2)	Under Review

Growing Support for New Nuclear Power Plants



Supporters Rally in Favor of a Proposed
Nuclear Plant in Mississippi

An Emerging Consensus: ***Nuclear energy key to future***

- **Key studies by MIT/Harvard/EIA/IEA**
- **Earth Institute at Columbia University**
- **Princeton University scientists**
- **Leading environmentalists**



James Lovelock



Patrick Moore

Dr. R.K. Pachauri- Chairman, IPCC



“Nuclear energy is the best option to curb carbon emissions”

Dr. R.K. Pachauri, Chairman
Intergovernmental Panel on
Climate Change

August , 2008

Yvo de Boer - Executive Secretary, UNFCCC



“I have never seen a credible scenario for reducing emissions that did not include nuclear energy”

June 2007

McCain Sets Goal of 45 New Nuclear Reactors by 2030



Presidential Candidate Senator Barack Obama



- *“As President, I will ...find ways to safely harness nuclear power.”*

August 2008

Virginia Business: Invested in a Nuclear Future

- Dominion Power
- AREVA
- URS
- Lockheed Martin
- Northrop Grumman
- General Dynamics
- Curtiss Wright
- Kiewit Federal
- Booz Allen
- Babcock & Wilcox
- Accenture
- Alion
- Hunton & Williams
- Hyperion Power
- Virginia Uranium
- Virginia Tech

Babcock & Wilcox's Virginia Impact

- A global company based in Virginia with over 140 years in the energy technology business
- Three of the company's four business units are headquartered in Lynchburg—Commercial Nuclear, Management and Operations Service and Government Contracts
- Approximately 2,500 employees working in Virginia
- Hiring Graduates from Virginia colleges and universities
- Funding thousands in community donations and sponsorships
- Significant part of Virginia's nuclear renaissance

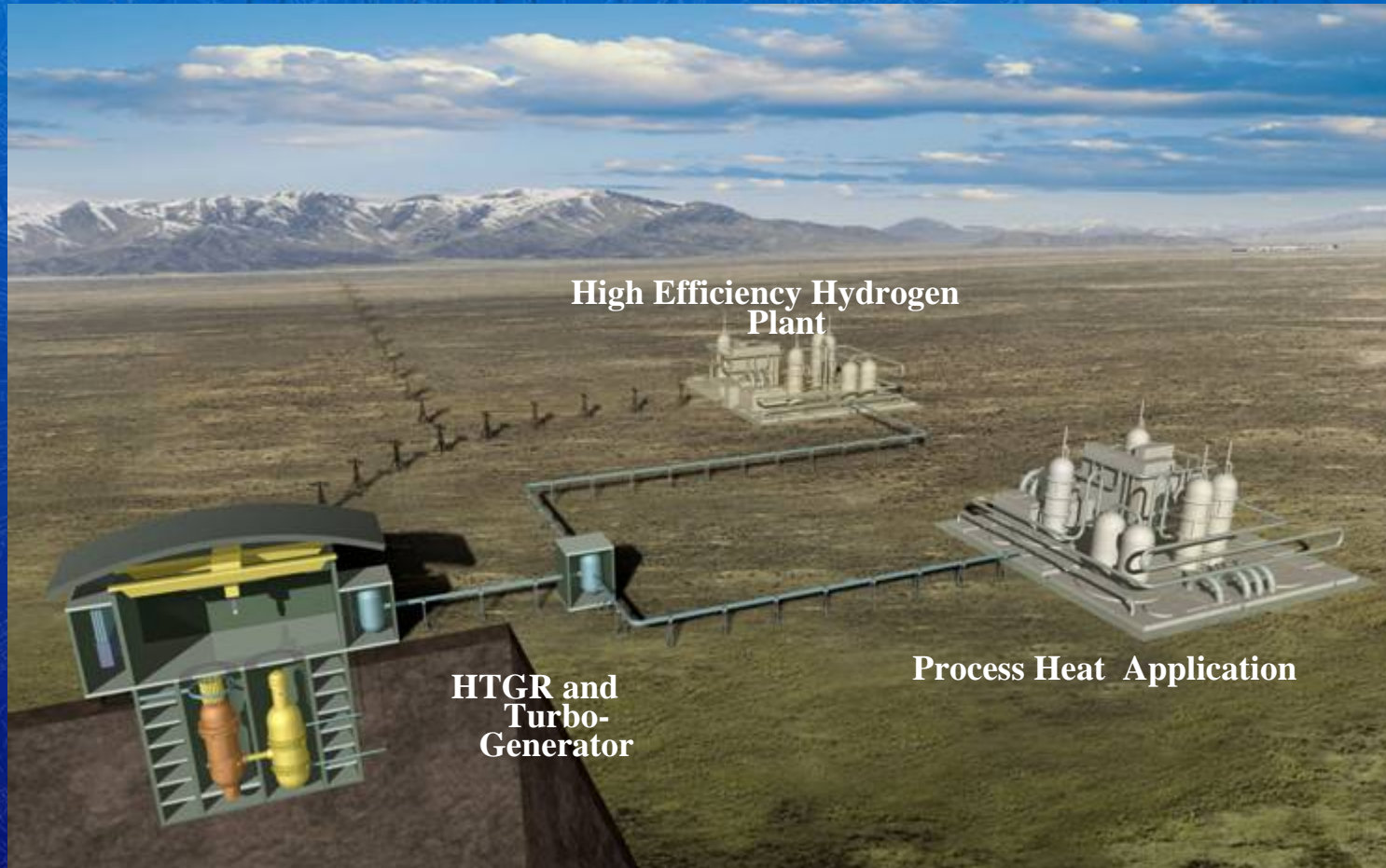
Virginia Uranium Resources

- Cole Hills, a world-class uranium deposit in southern, Virginia
- Only one of three mega-deposits in North America outside of Athabasca
- 110 million lbs of U_3O_8

Virginia Governor Kaine's 2007 Energy Plan

- “There are sufficient resources to support a uranium mining industry in Pittsylvania County with enough to meet the fuel needs of Virginia’s current generation (see Chapter 2). Significant work to assess the risk from mining and need for regulatory controls must be completed before any decision can be made whether such mining should take place.” (p.101)**
- **“Virginia should assess the potential value of and regulatory needs for uranium production in Pittsylvania County.” (p.169)**
 - **“Virginia should take steps during the term of this Plan to understand the environmental risks and identify controls needed if uranium mining were to be allowed.” (p.19)**

The NGNP Concept – HTGR Demonstration



Nuclear and PHEV's Seen as Top Alternatives

- Alternatives to Foreign Oil
 - Nuclear 70%
 - PHEV's 75%
 - Renewables 65%

Rasmussen Reports Survey (8/20/08)

NEI's Favorite Alternate Fuel Vehicle

