

Greening the Grid with America's Nuclear Power Plants



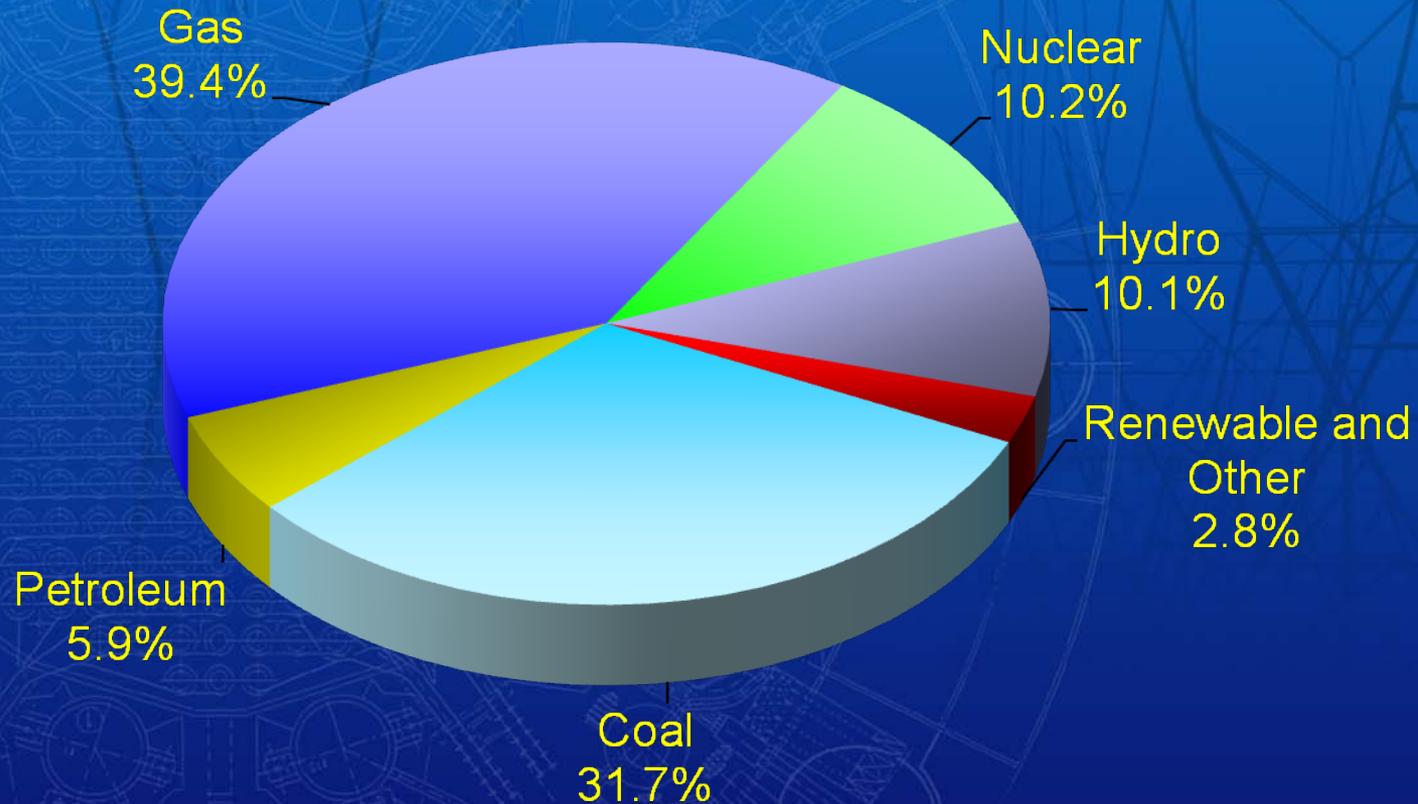
NUCLEAR ENERGY INSTITUTE



Overview

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

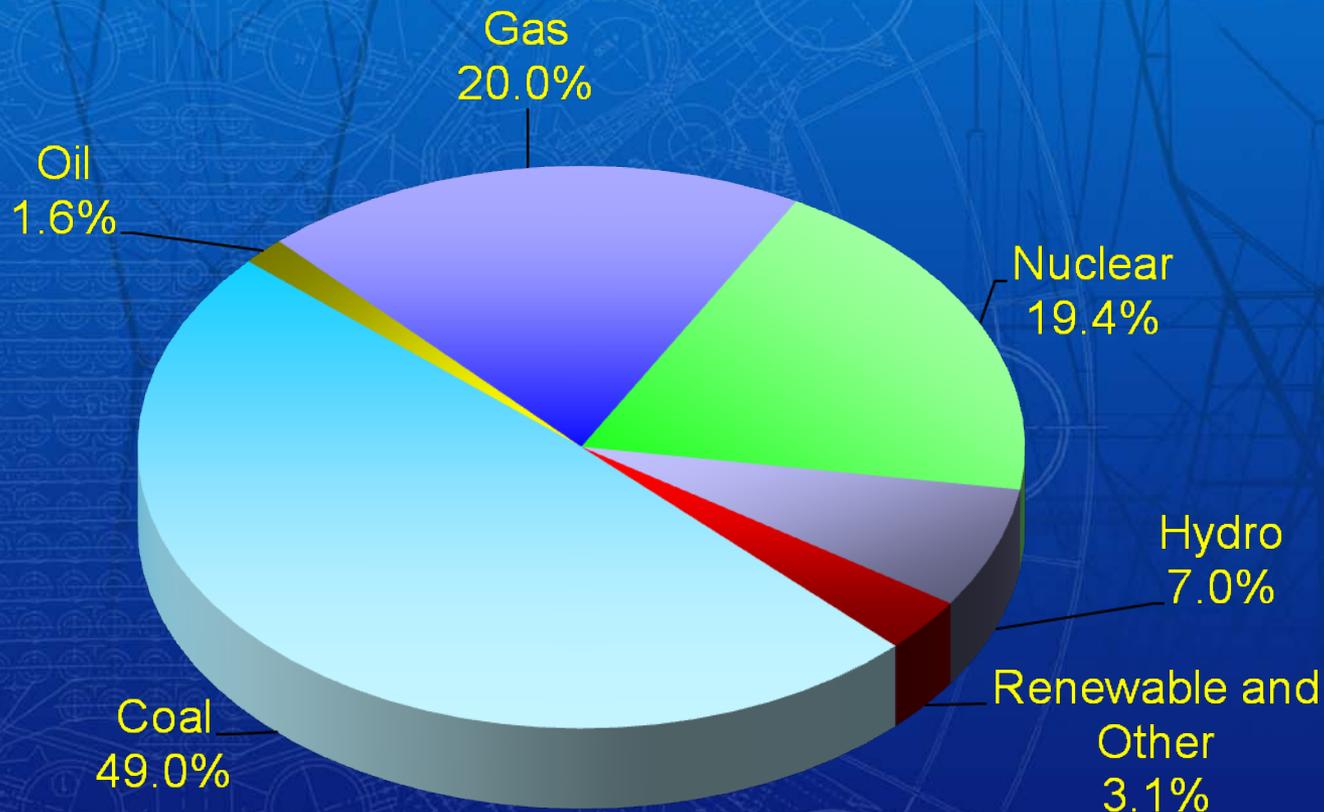
U.S. Total Generating Capacity 2006



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

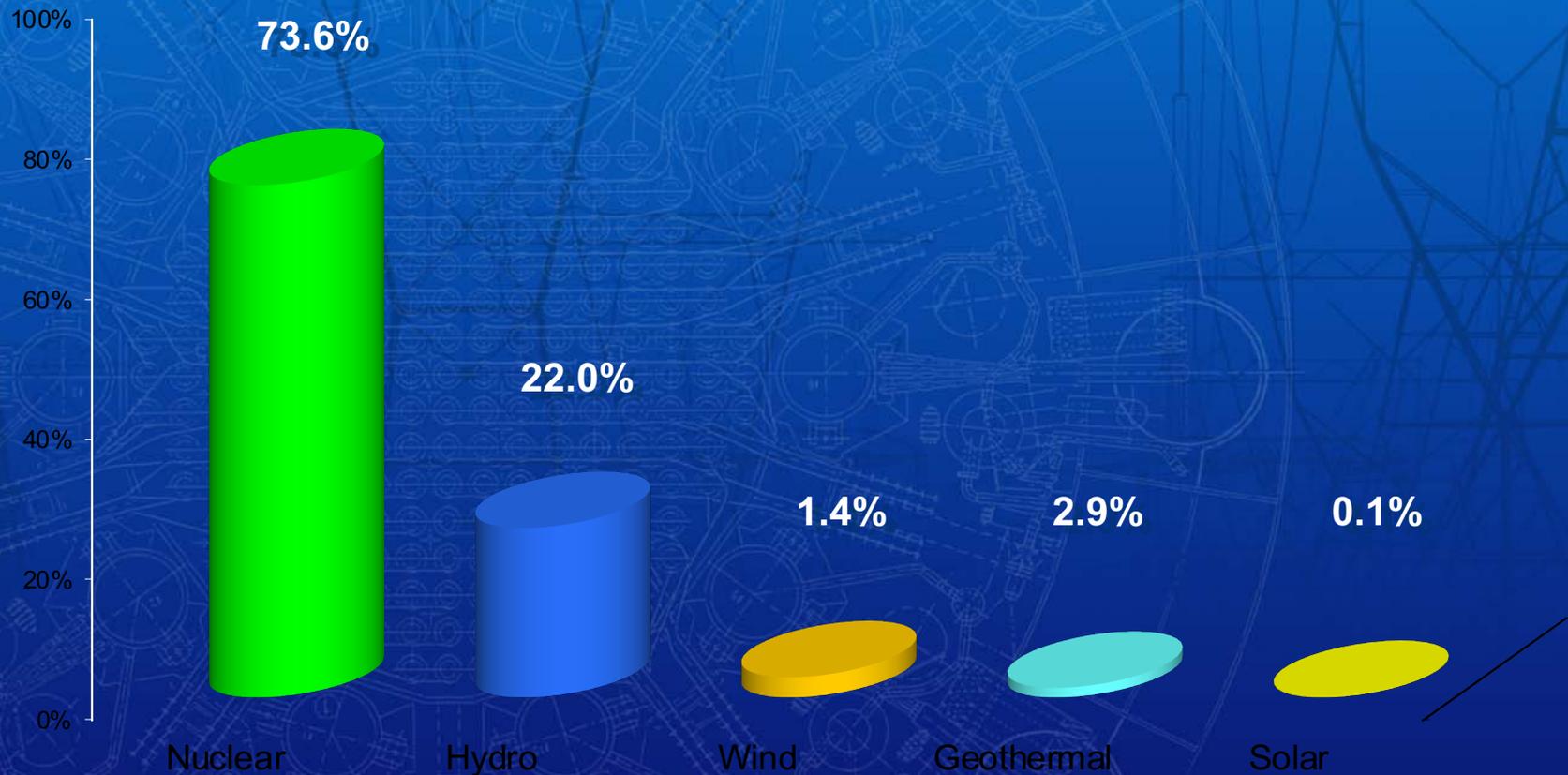


U.S. Electricity Generation Fuel Shares 2006



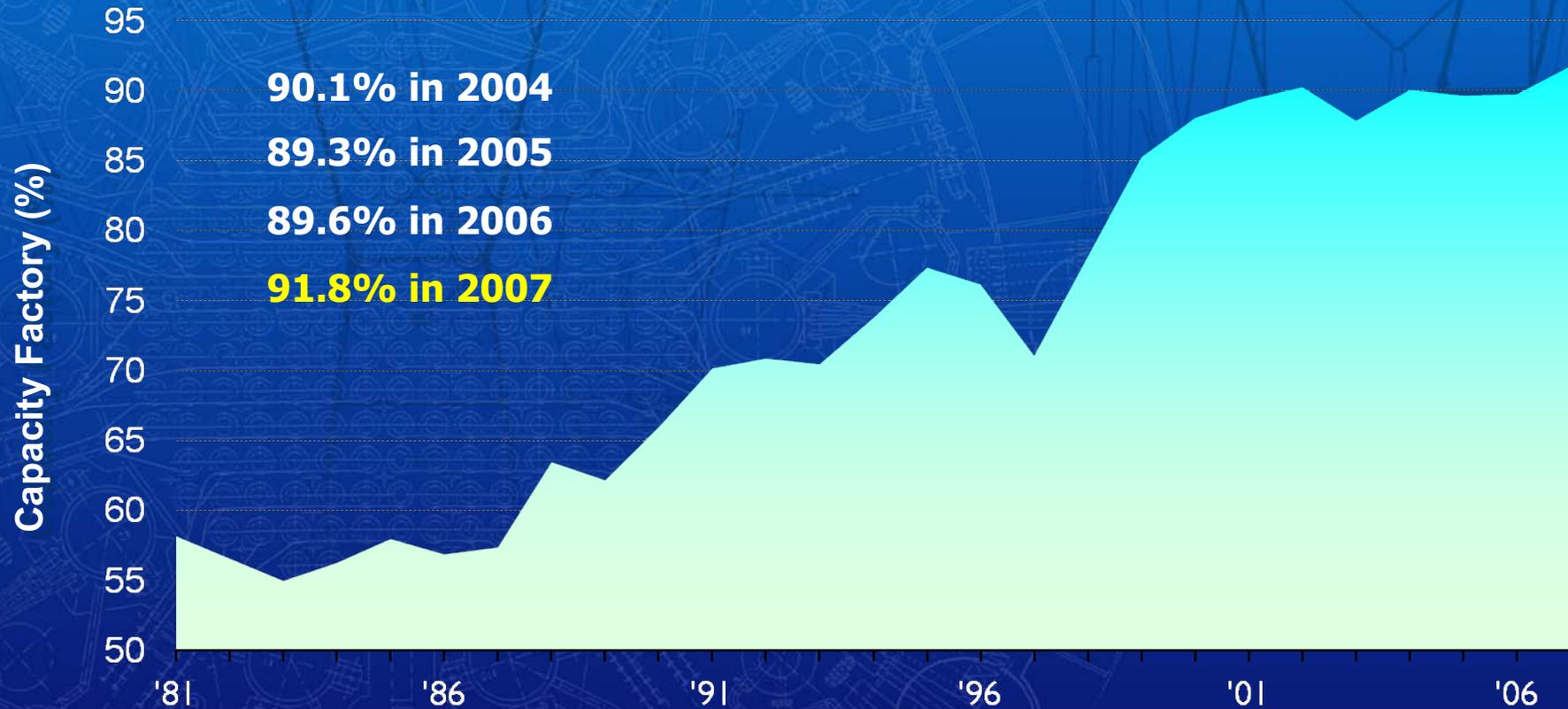
Source: Global Energy Decisions / Energy Information Administration
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Emission-Free Sources Of Electricity



Industry Performance Is Consistently Excellent

U.S. Nuclear Capacity Factor, Percent

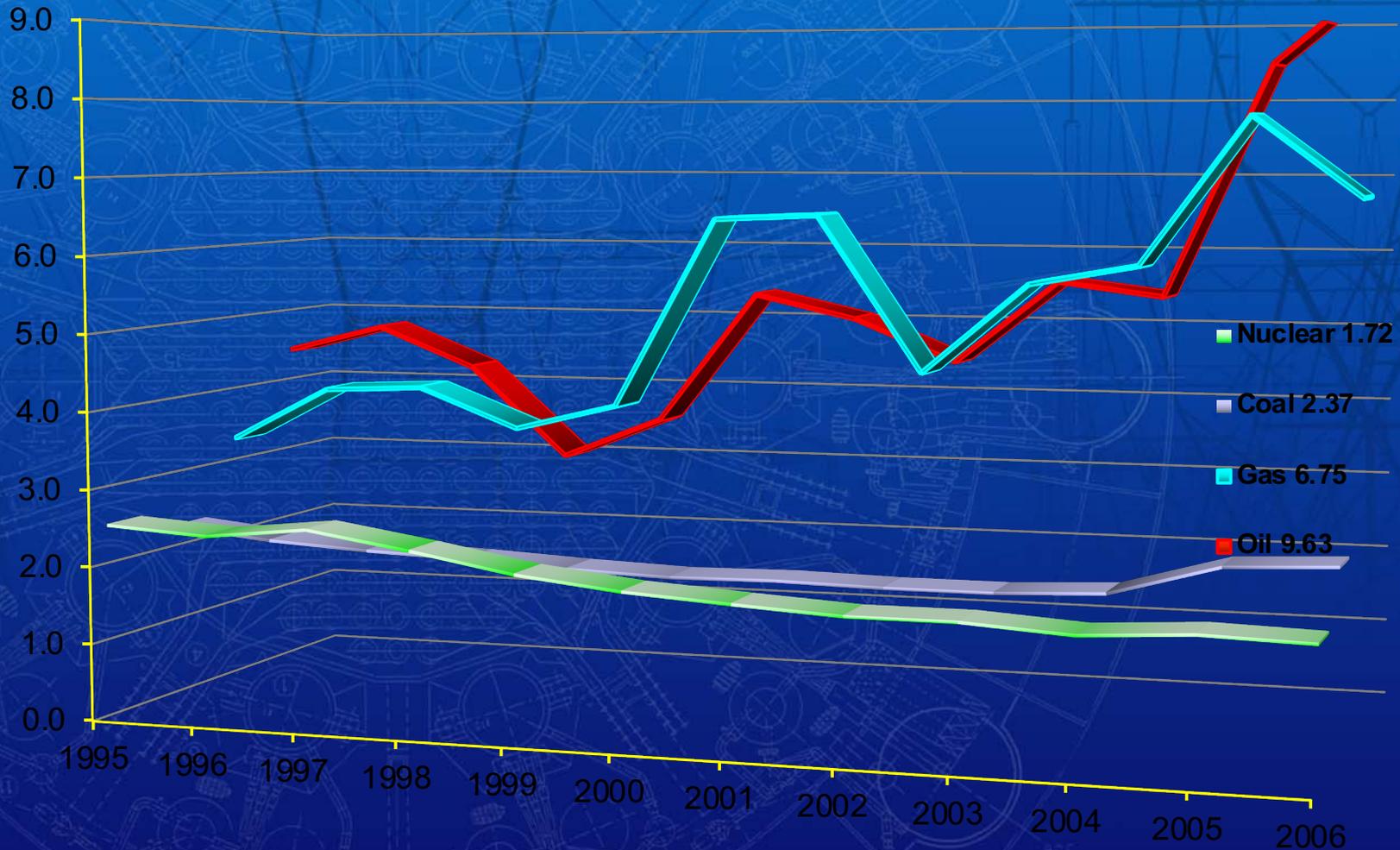


Source: Energy Information Administration



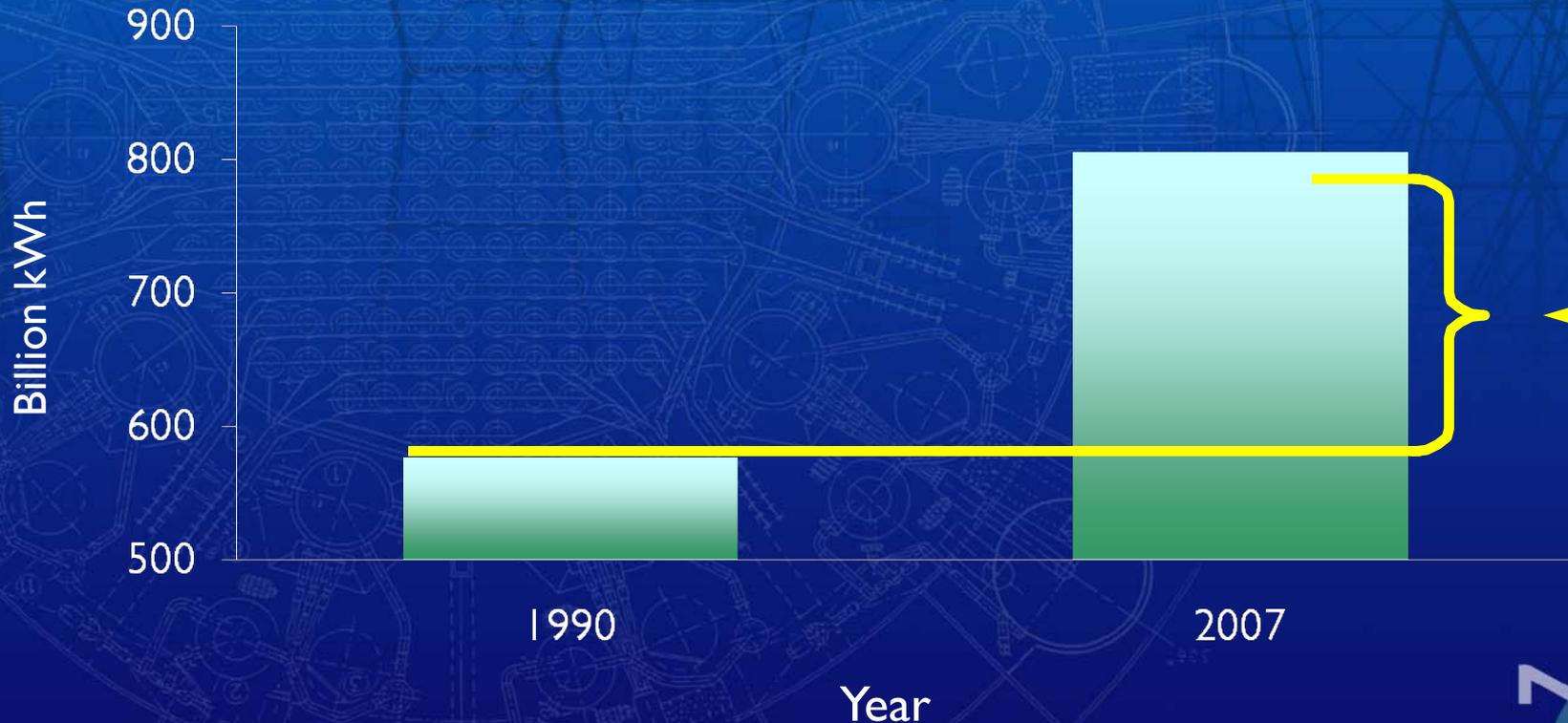
U.S. Electricity Production Costs

(in constant 2006 cents/kWh)

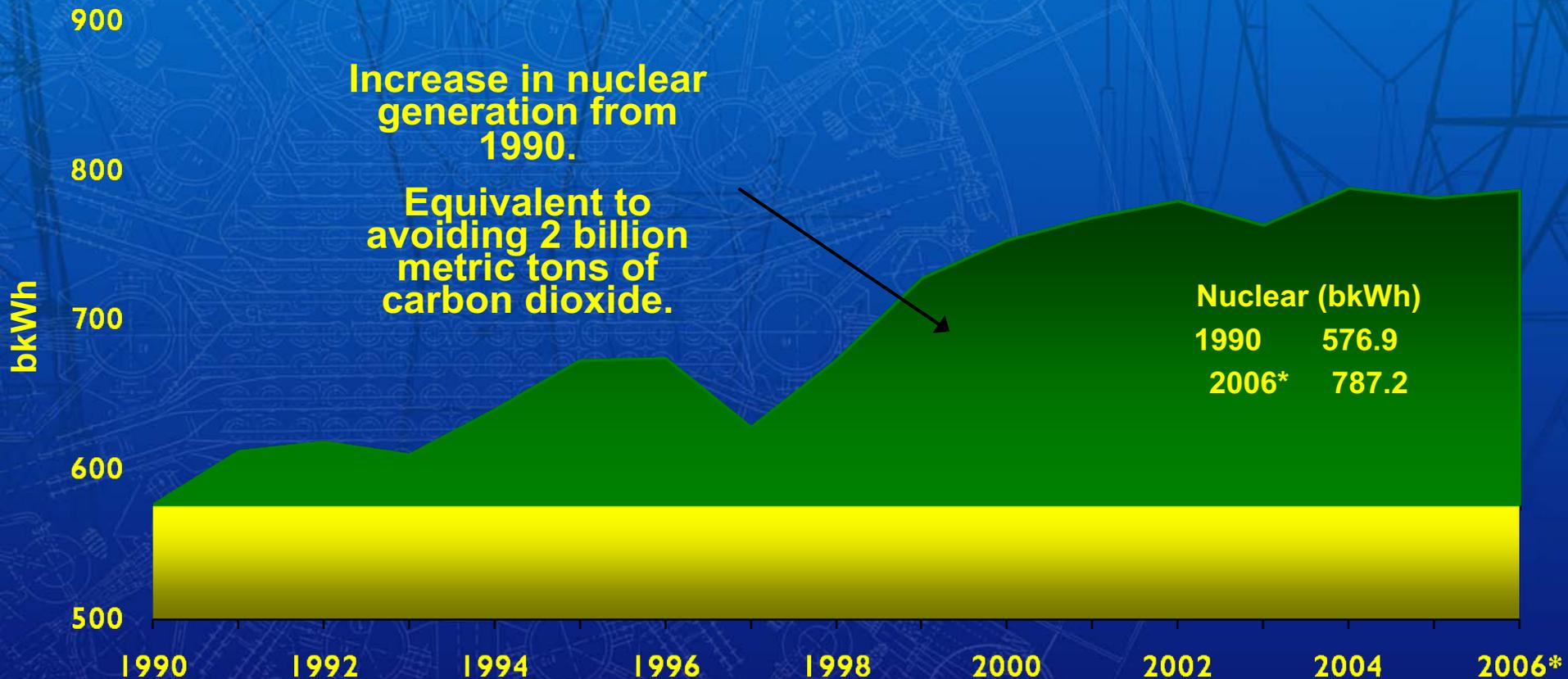


Growth in Nuclear Plant Output: 1990 – 2007

Equivalent to 29 new 1,000-megawatt power plants



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



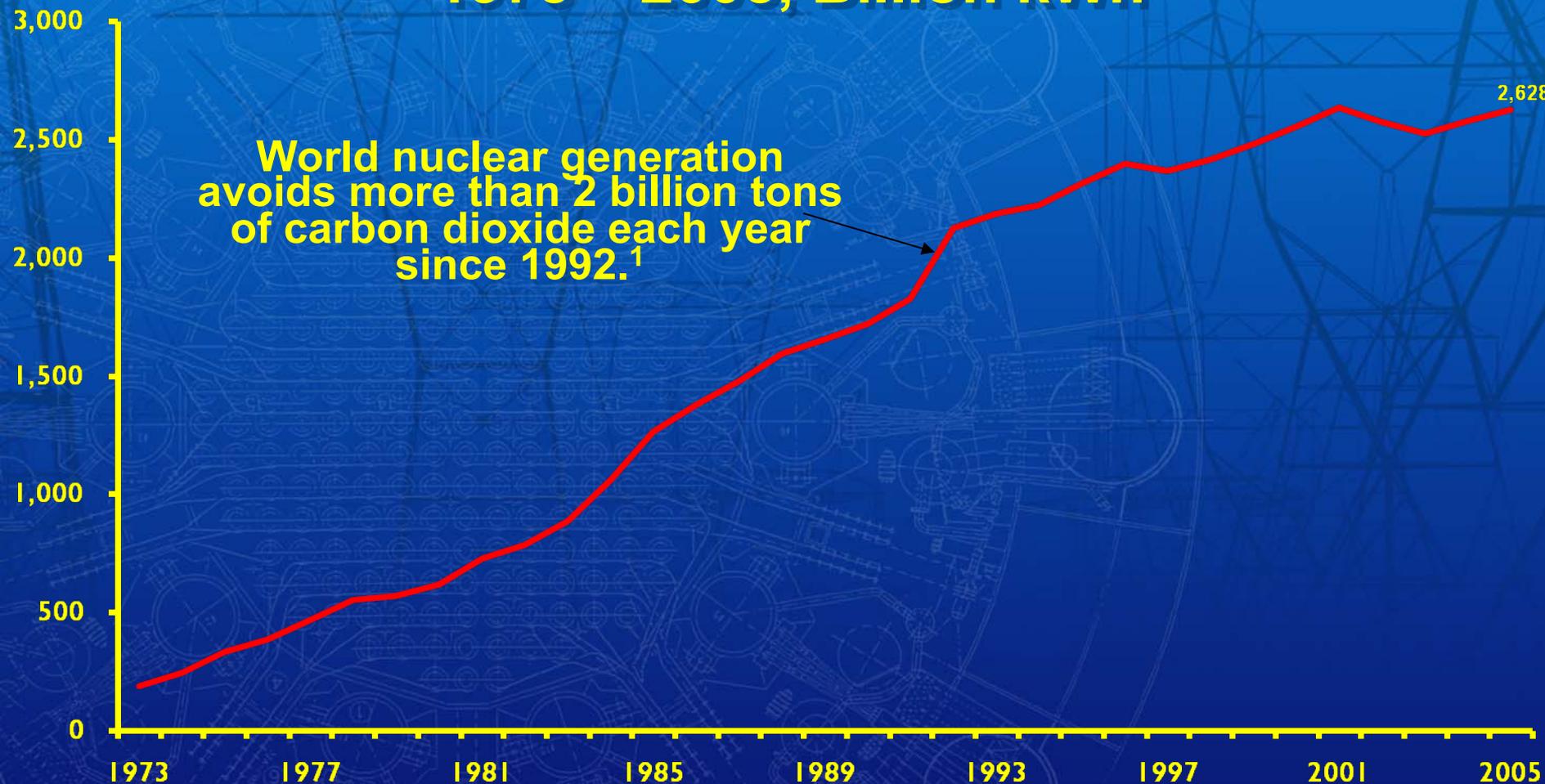
* Preliminary

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



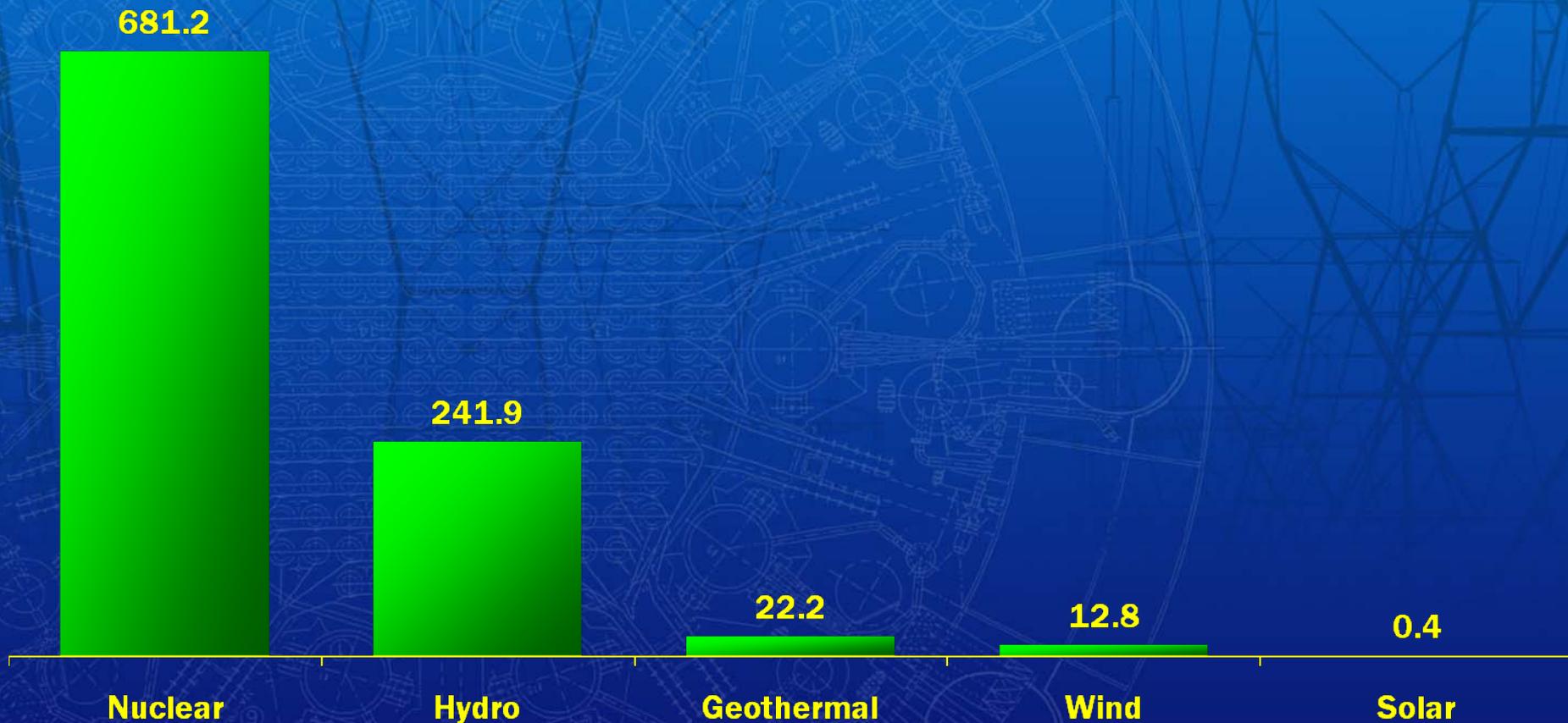
Emissions Reductions in Perspective

- 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

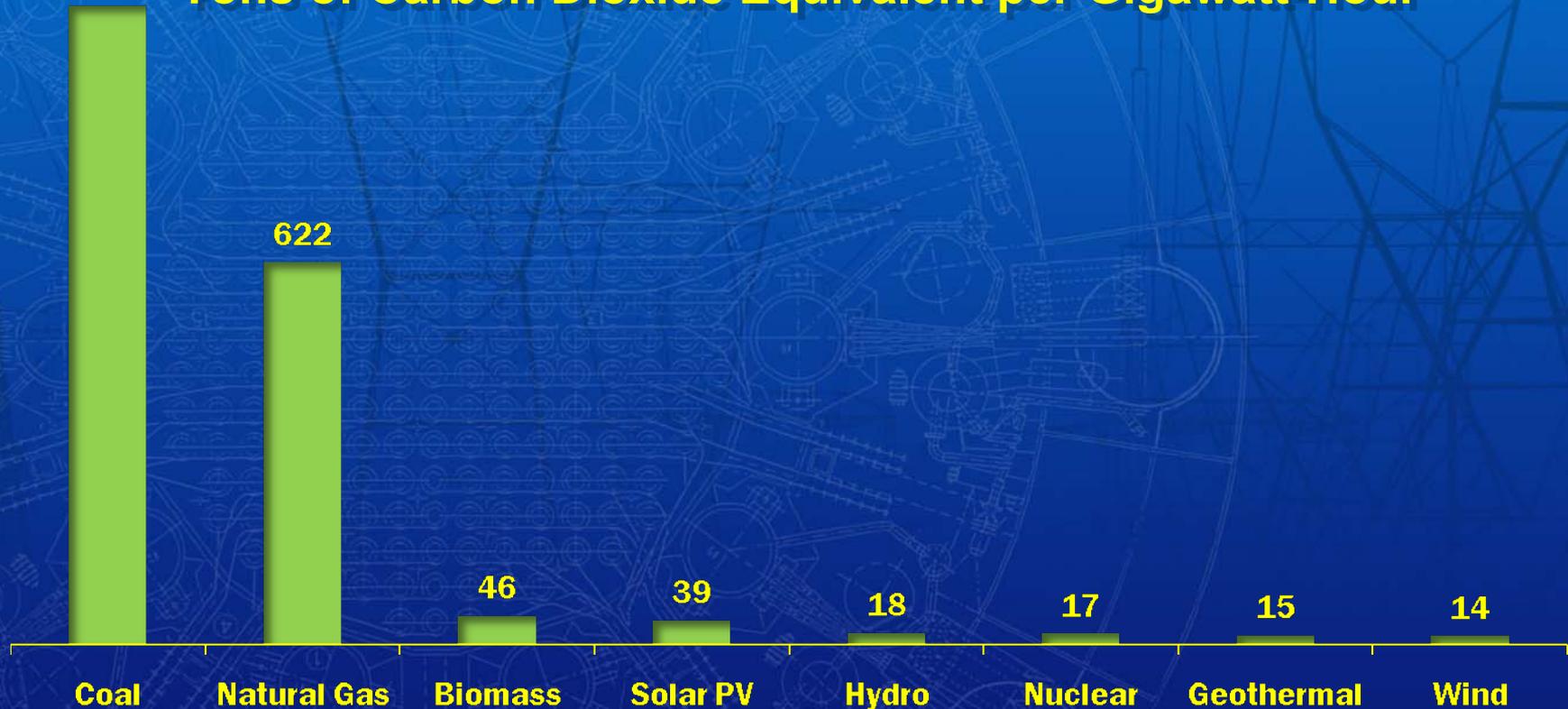


Source: Emissions avoided are calculated using regional and national fossil fuel emissions rates from the Environmental Protection Agency and plant generation data from the Energy Information Administration.

Updated: 4/07

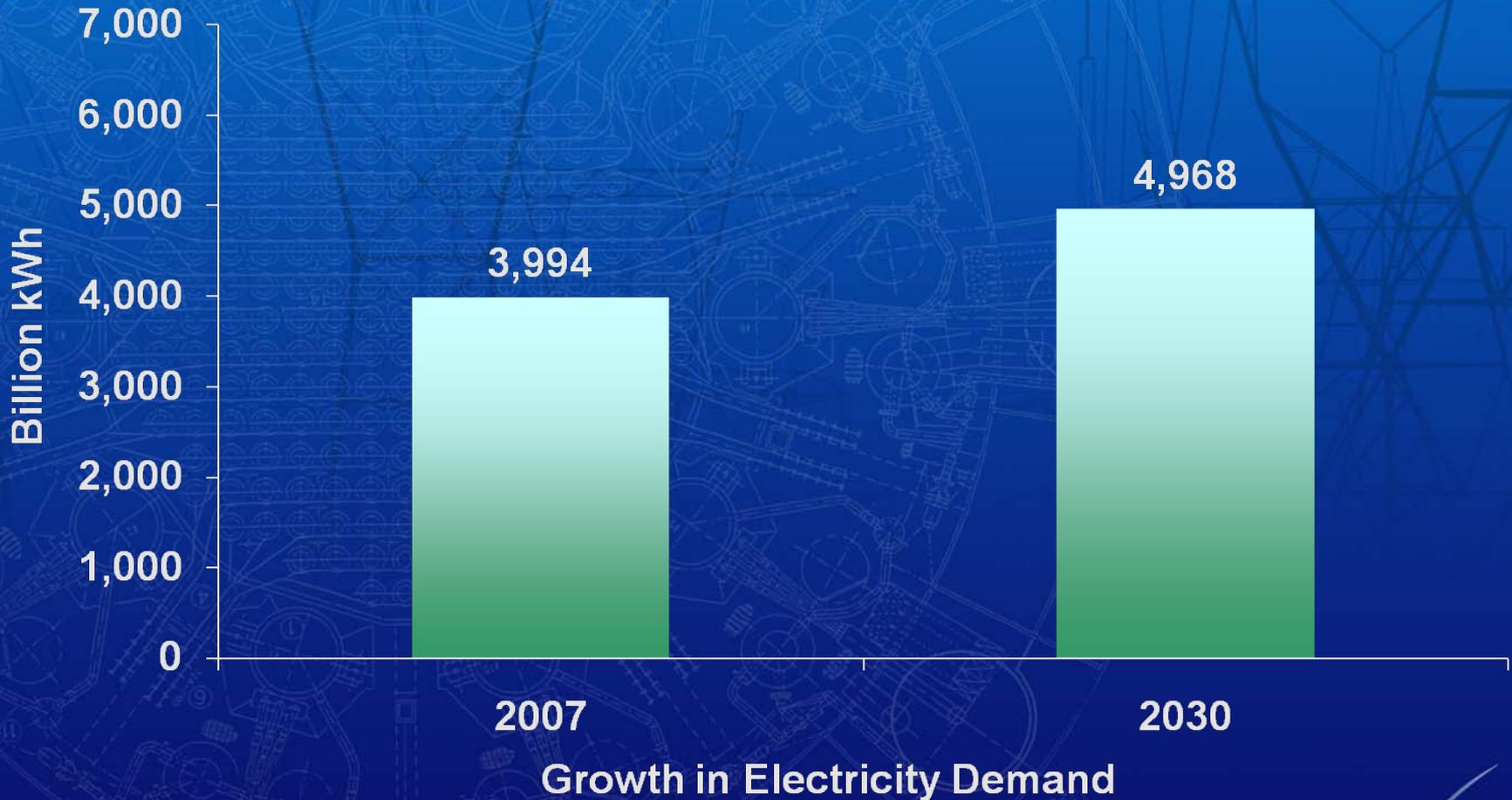
Comparison of Life-Cycle Emissions

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



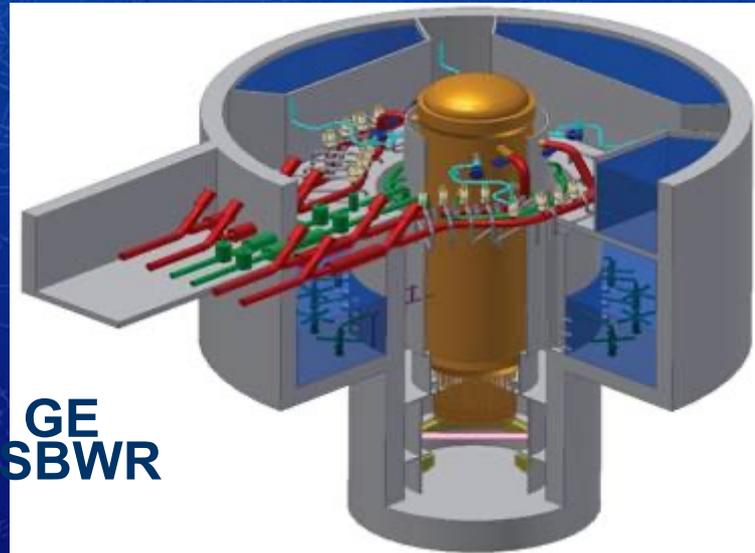
What's New ... Designs Under Consideration



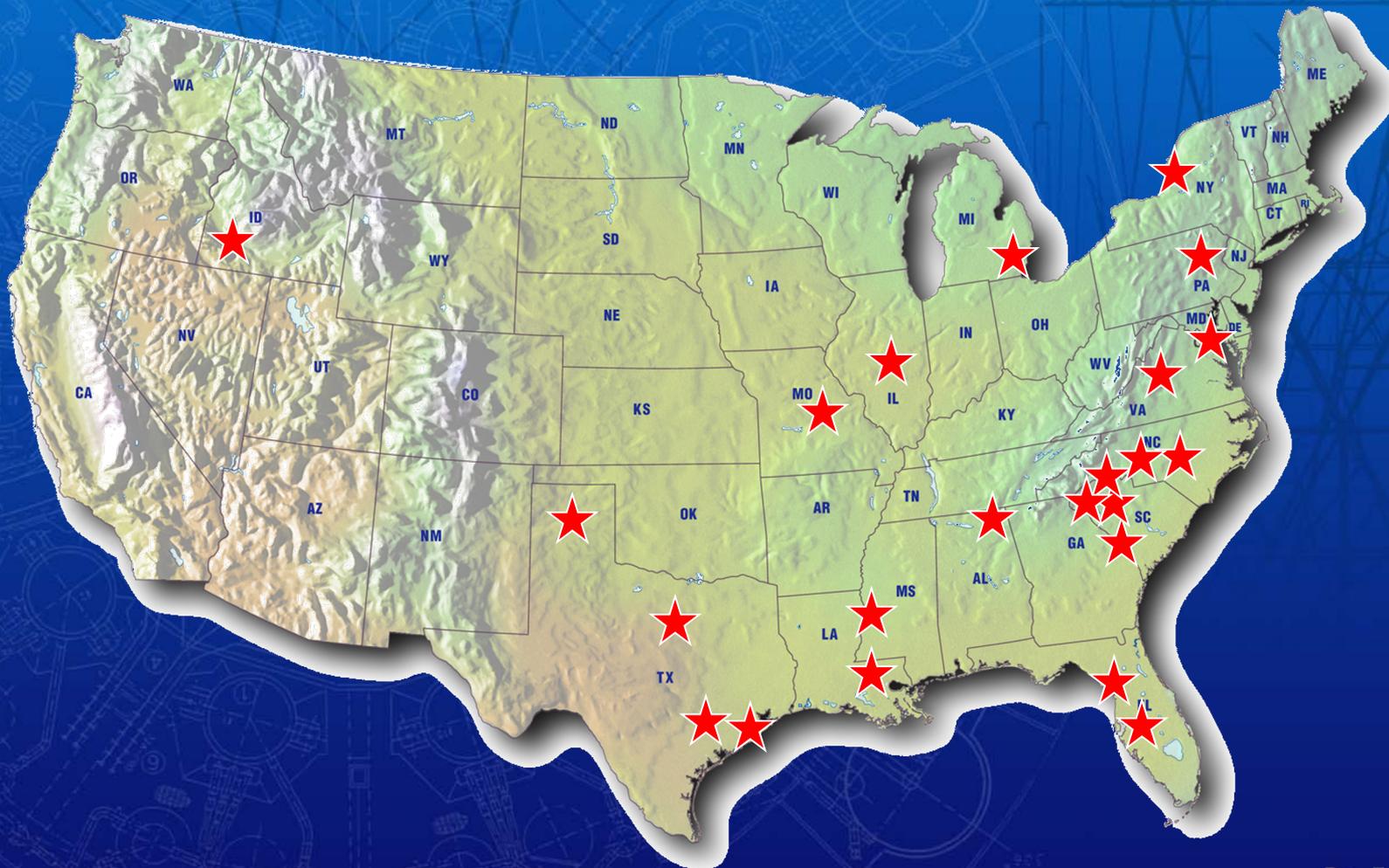
AREVA
EPR



GE
SBWR



Potential Locations for New Nuclear Plants



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**

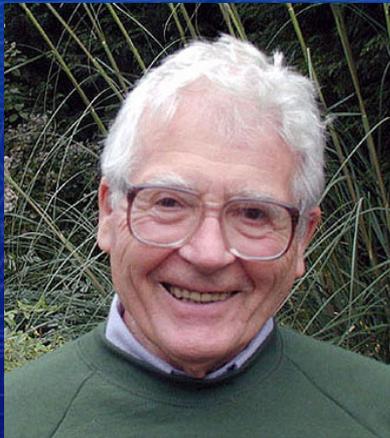
Nuclear and PHEV's Seen as Top Alternatives

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

Rasmussen Reports Survey (8/20/08)

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.”*

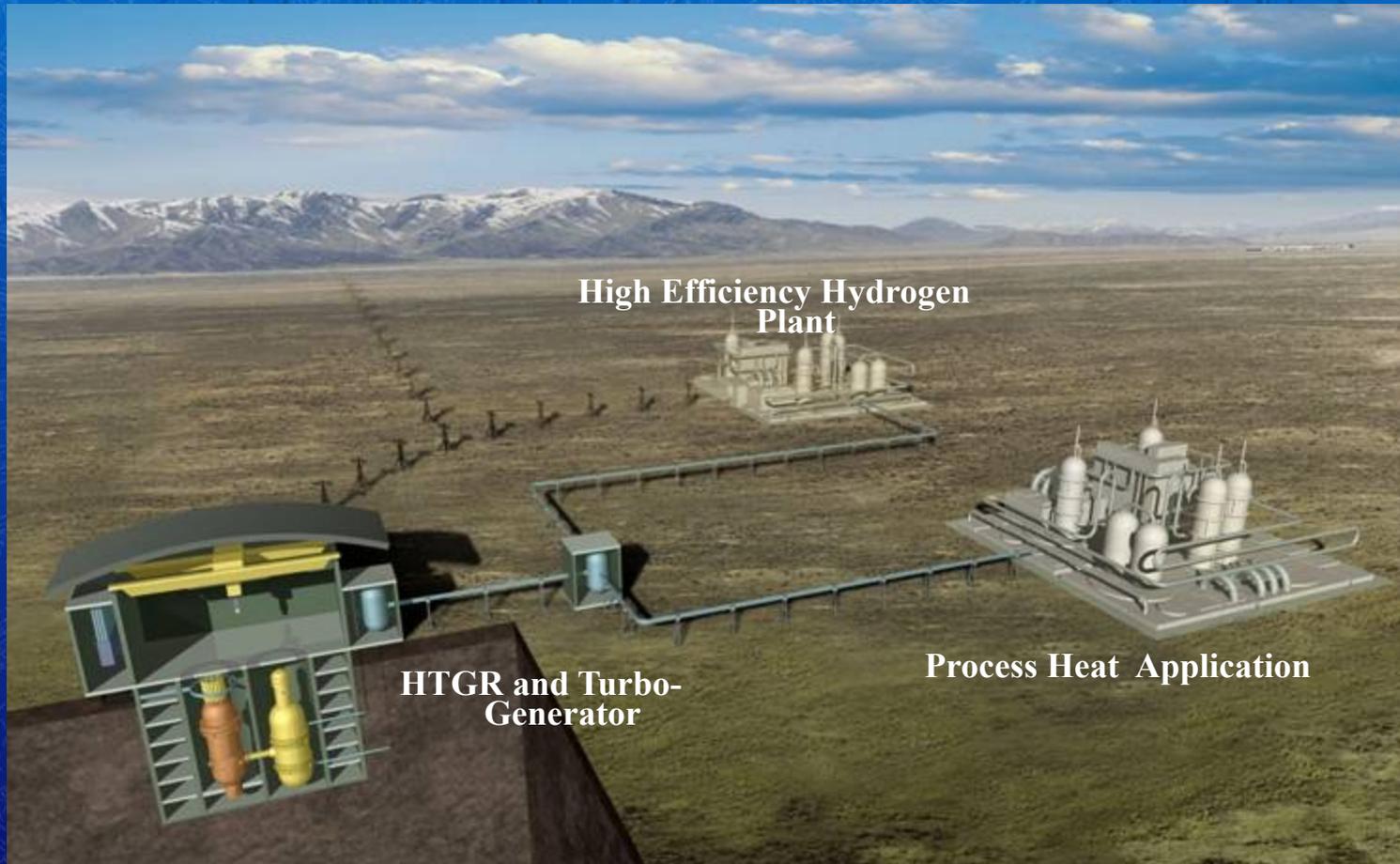
August 2008

One of Bill Gates New Interests?

- Gates is investing in a project inside Myhrvold's Intellectual Ventures LLC, which is working on a new type of nuclear reactor that would use fuels other than enriched uranium -- including spent fuel from existing reactors.
- The idea is to create a nuclear reactor that is simpler and cheaper than current reactors, and generates clean power without waste or proliferation problems, Myhrvold said.

Source: seattlepi.com June 2008

The NGNP Concept – HTGR Demonstration



NEI's Favorite Alternate Fuel Vehicle

