THE U.S. NUCLEAR RENAISSANCE AND THE CHALLENGES IT PRESENTS

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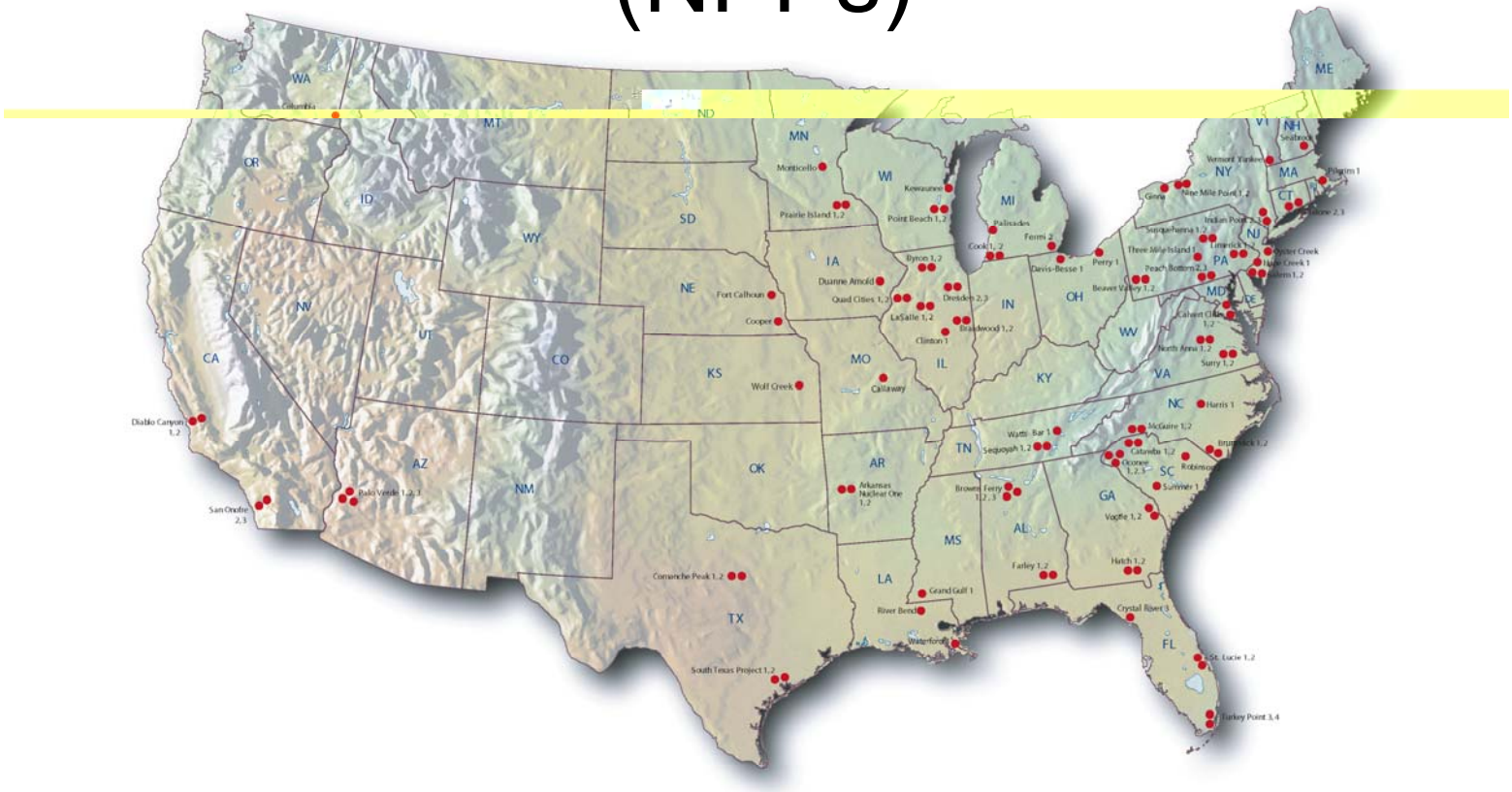
Lynchburg, VA
May 15, 2008

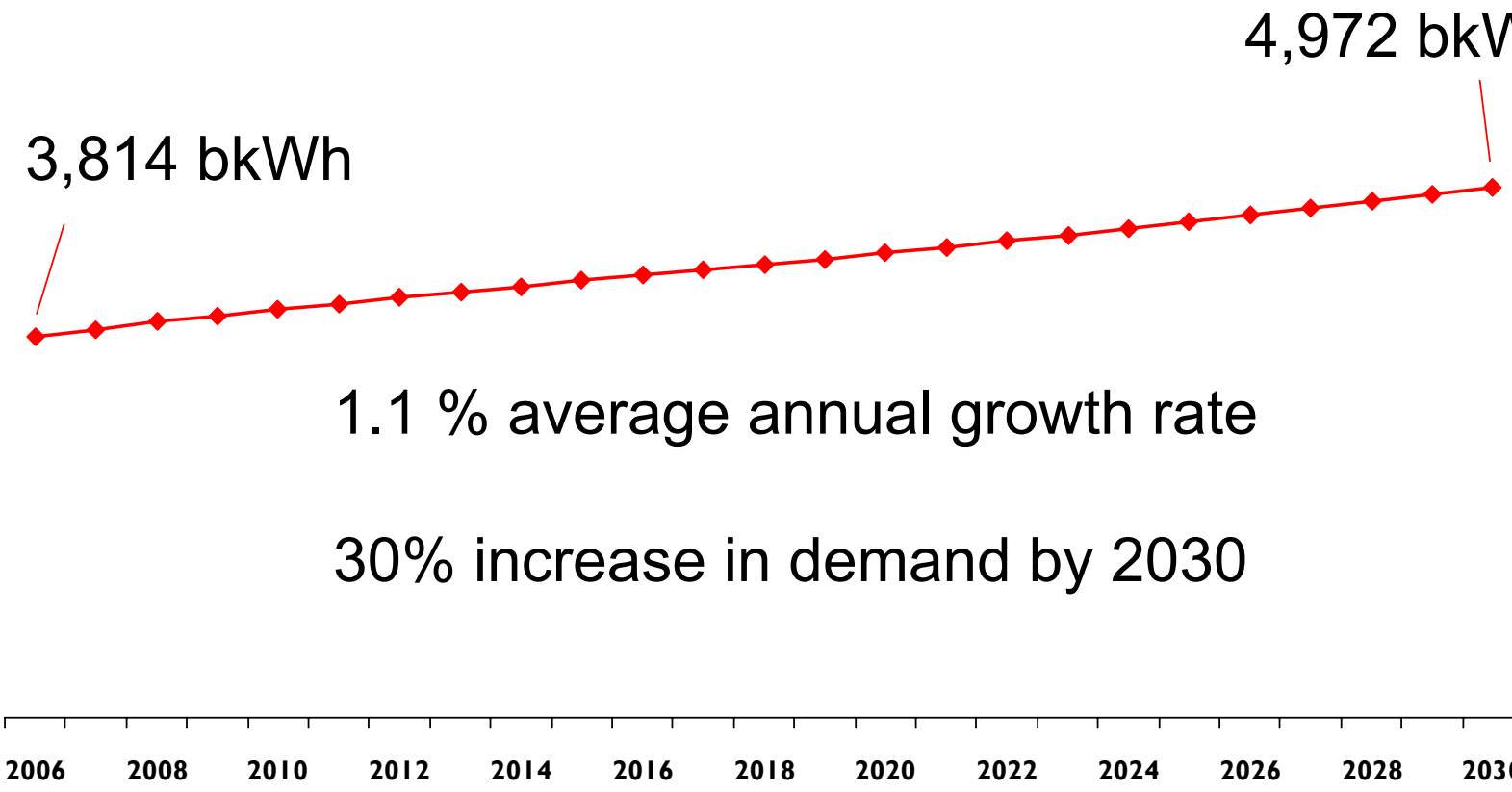
U.S. Operating Nuclear Power Plants (NPPs)



104 Operating Reactors
~20% of U.S. Electricity

Announced Potential New NPPs

U.S. Electricity Demand Growth

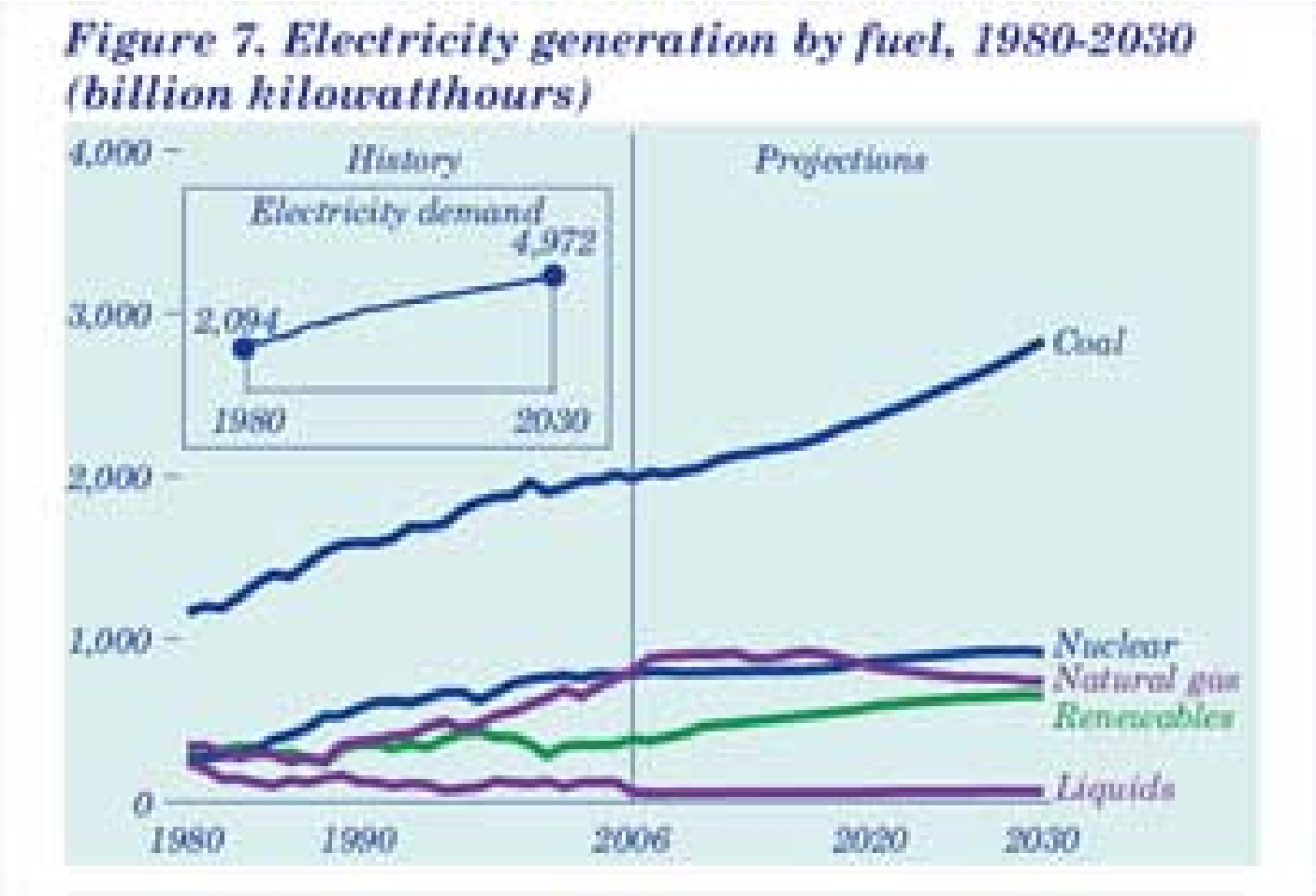


1.1 % average annual growth rate

30% increase in demand by 2030

Source: DOE EIA's 2008 Annual Energy Outlook
Updated: 3/08

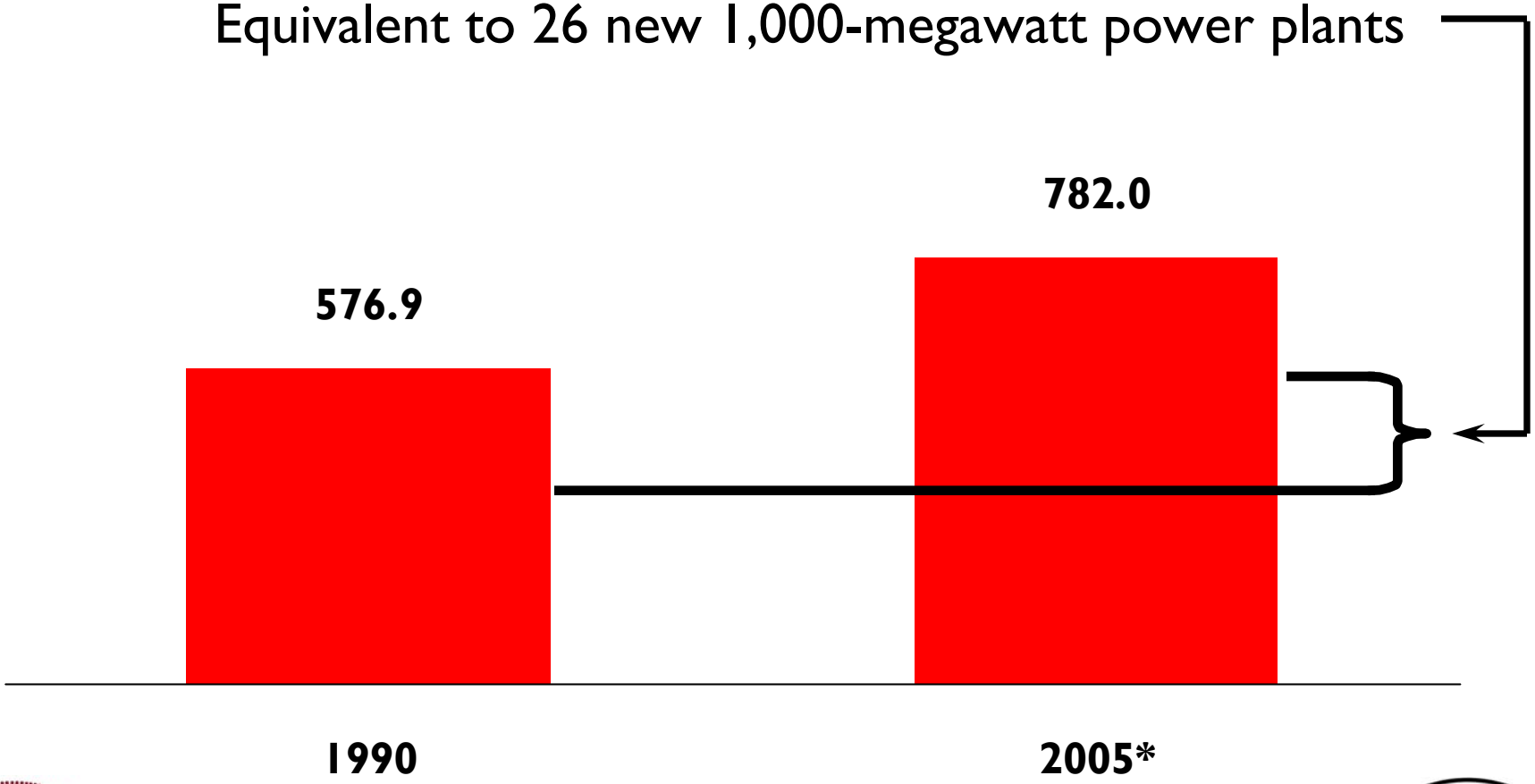
Projection of Electricity Generation by Fuel



Source: DOE EIA's 2008 Annual Energy Outlook
Updated: 3/08

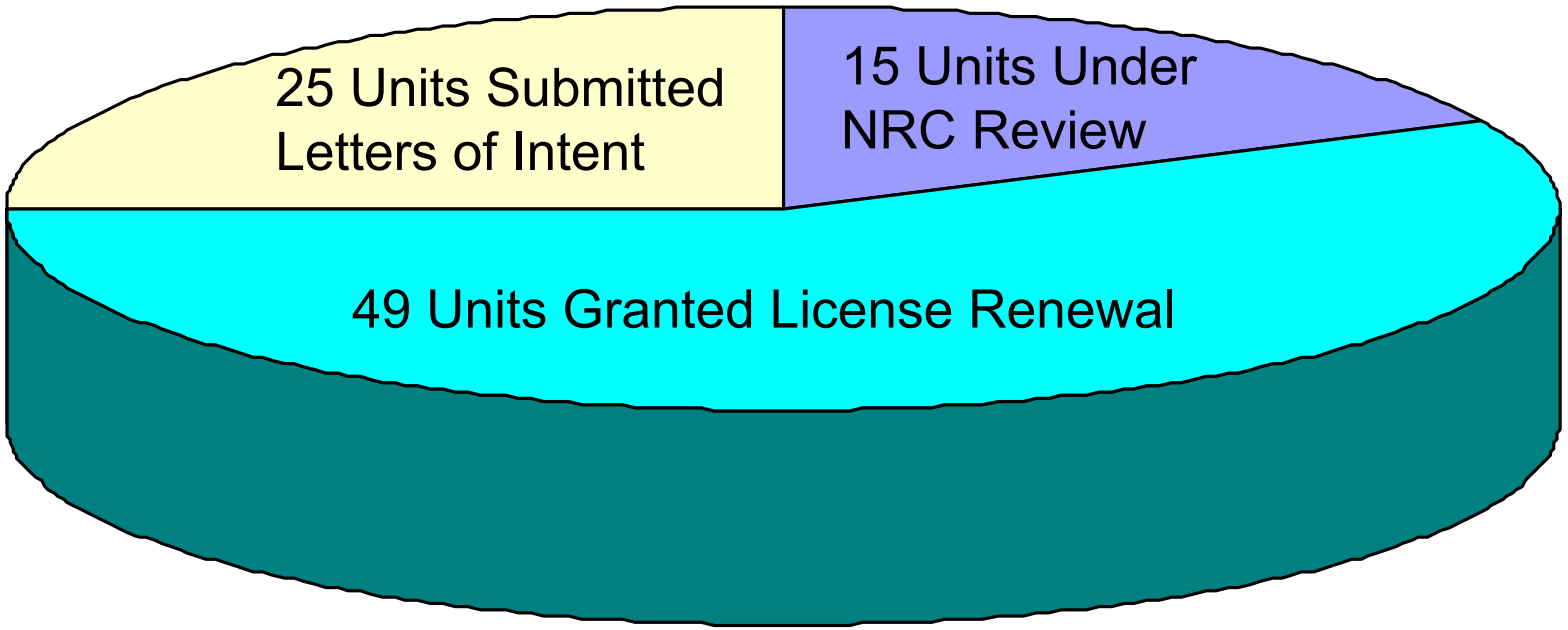
Growth of U.S. NPP Production During Recent 15 Years **(billion kWh)**

Equivalent to 26 new 1,000-megawatt power plants



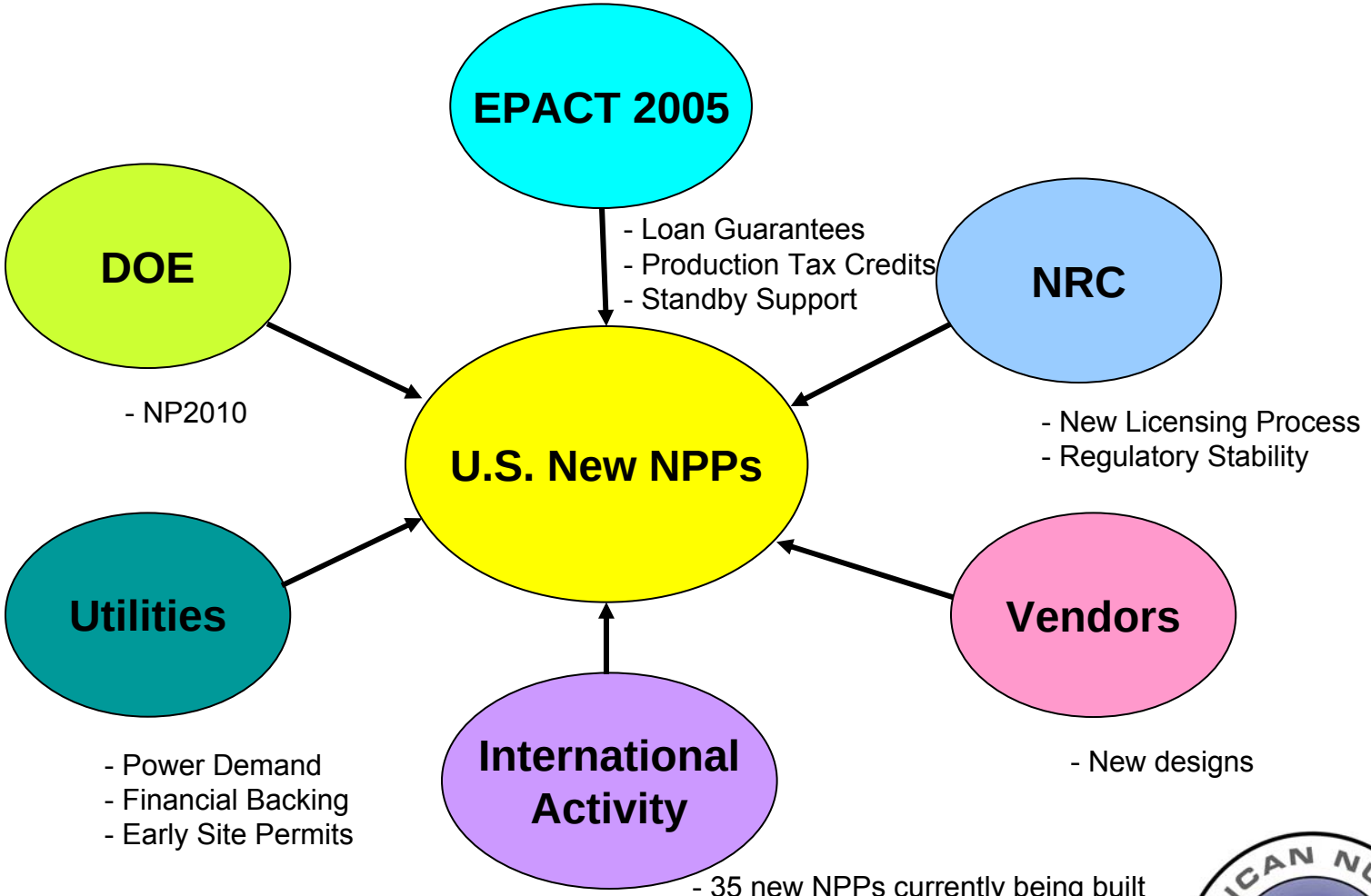
*Source: Global Energy Decisions / DOE Energy Information Administration
Updated: 4/06

U.S. Applications For License Renewal



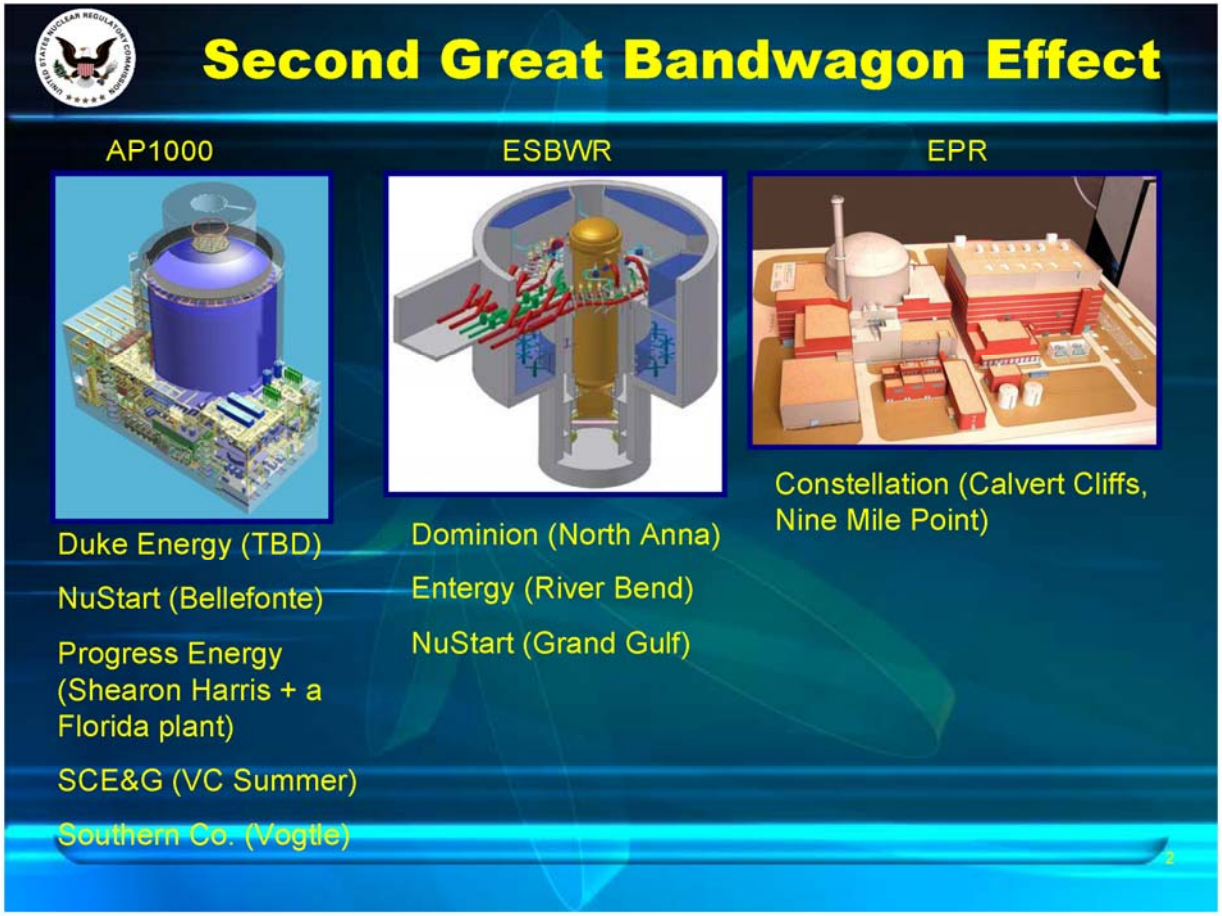
Source: U.S. Nuclear Regulatory Commission
Updated: 5/08

Factors Which Influence Consideration of New U.S. NPPs



Many factors are converging NOW!

> 30 COL Applications Announced Since January, 2006



Source: U.S. Nuclear Regulatory Commission
2006 Regulatory Information Conference

Announced COL Applications

Company	NPP Design	Number of Units	COL Submittal Date
Alternate Energy Holdings	EPR	TBD	FY 2009
Amarillo Power	EPR	TBD	FY 2009
AmerenUE	EPR	TBD	FY 2008
Constellation (UniStar)	EPR (3)	3	March 2008
Detroit Edison	TBD	TBD	FY 2008
Dominion	ESBWR	1	November 2007
Duke	AP1000	2	December 2007
Duke	TBD	TBD	TBD
Entergy	ESBWR	1	FY 2008
Entergy (NuStart)	ESBWR	1	February 2008
Exelon	TBD	TBD	TBD
Exelon	ESBWR	2	FY 2008
Florida Power & Light	TBD	2	FY 2009
Luminant	APWR	2	FY 2008
NRG Energy / STPNOC	ABWR	2	September 2007
PPL Corp.	EPR	1	FY 2009
Progress Energy	AP1000	4	March 2008
South Carolina Electric & Gas	AP1000	2	March 2008
Southern Company	AP1000	2	March 2008
TVA (NuStart)	AP1000	2	October 2007

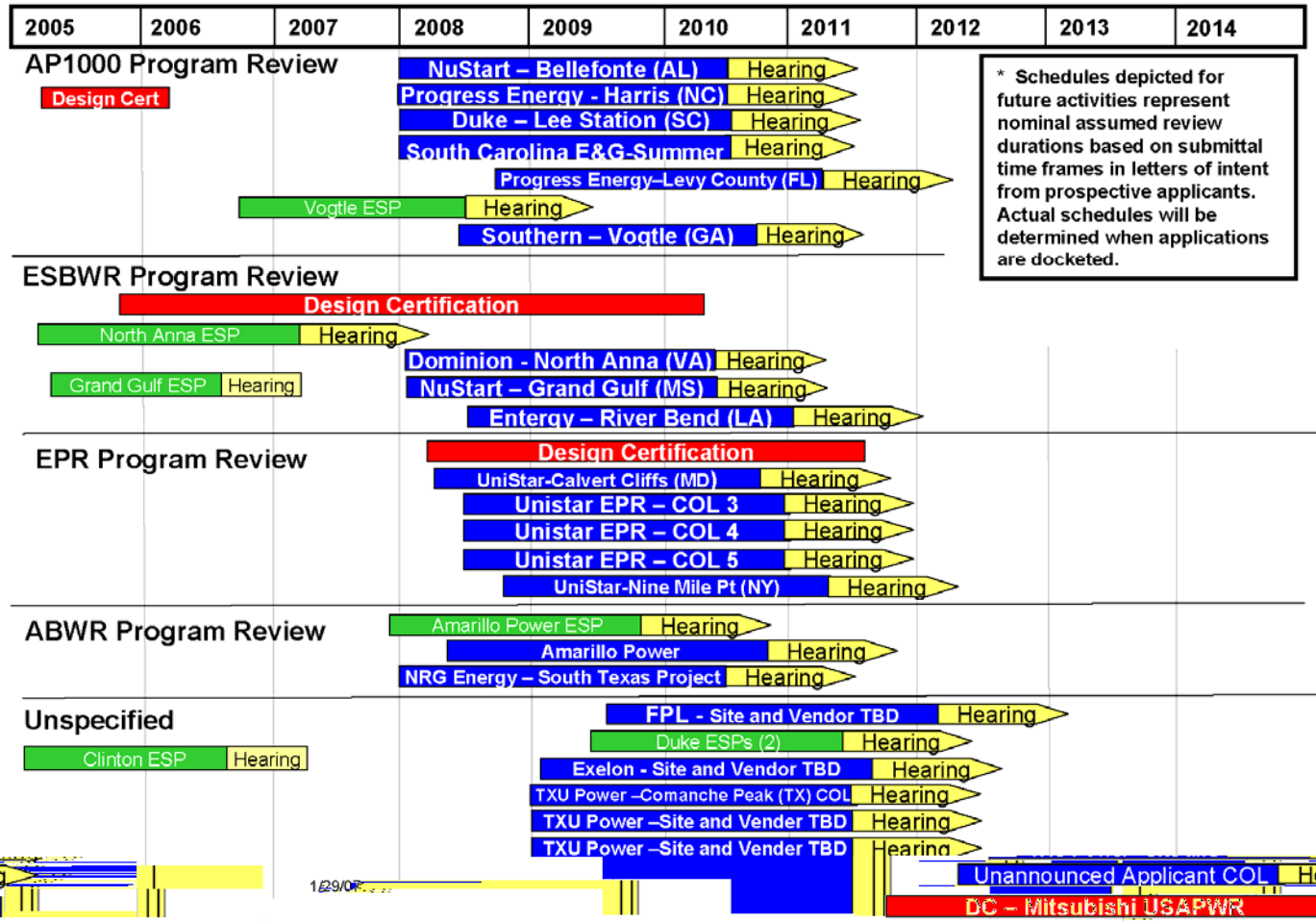
Source: Nuclear Energy Institute
Updated: 5/08

Summary of COL Applications

- 17 companies preparing COL applications for at least 33 reactors
- 4 NPP designs certified, 4 under review
- 3 early site permits issued, 6 companies considering applications
- Industry expenditure to date on new NPPs – $3+ billion
- 4 COL applications submitted in 2007
- 5 COL application submitted YTD in 2008

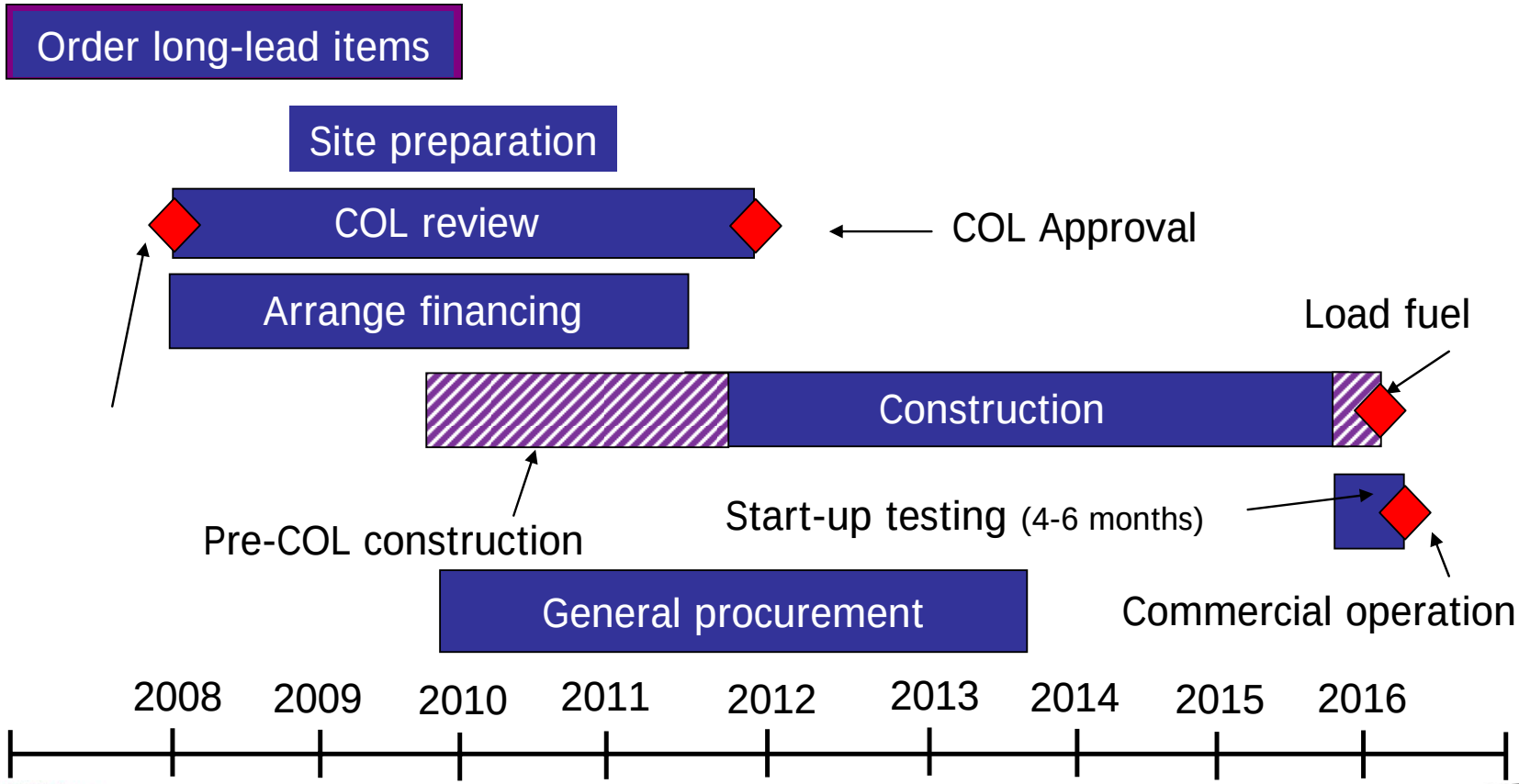
Sources: Nuclear Energy Institute,
Nuclear Regulatory Commission
Updated: 5/08

New NPP Licensing Applications



Source: U.S. Nuclear Regulatory Commission
2007 Regulatory Information Conference

Schedule Leading to New NPP Operation



Source: NEI Manufacturing Workshops
Columbia, SC 3/08
Cleveland, OH 4/08

First U.S. New NPP Ordered – April 8

Georgia Power, acting for itself and for **Plant Vogtle**'s co-owners (Oglethorpe Power, Municipal Electric Authority of Georgia [MEAG Power], and Dalton Utilities), entered into an

Engineering, Procurement and Construction contract (EPC) with a consortium consisting of **Westinghouse Electric Company LLC** and **The Shaw Group Inc.'s Power Group** for the engineering, procurement and construction of **two AP1000 nuclear units** with electric generating capacity of approximately **1,100 megawatts each** and related facilities.

Source: Georgia Power, Westinghouse, and Shaw Press Releases, 4/8/08

The Challenges

- Re-establish the nuclear infrastructure

Utilities	Universities
Vendors	Government
Labor	Investors

- Determine fabrication sources

- Maintain high performance standards
- Address proliferation concerns
- Continue to build public confidence

- Long-term nuclear waste disposal
  - License Yucca Mtn.
- Close the nuclear fuel cycle

Examples of Infrastructure Issues

- DOE funding for university Nuclear Education Programs
- Knowledge, experience, & labor shortages
- DOE failure to implement 1982 Nuclear Waste Policy Act
  - DOE Standard Contract with utilities
  - Accept SNF by January 31, 1998
- Delays in applying for Yucca Mountain repository license following 2002 approvals by Congress and President
- Slow implementation of 2005 Energy Policy Act
  - 4/24/06, Production tax credit
  - 8/4/06, Standby support coverage
  - 10/4/07, Clean-energy loan guarantee program

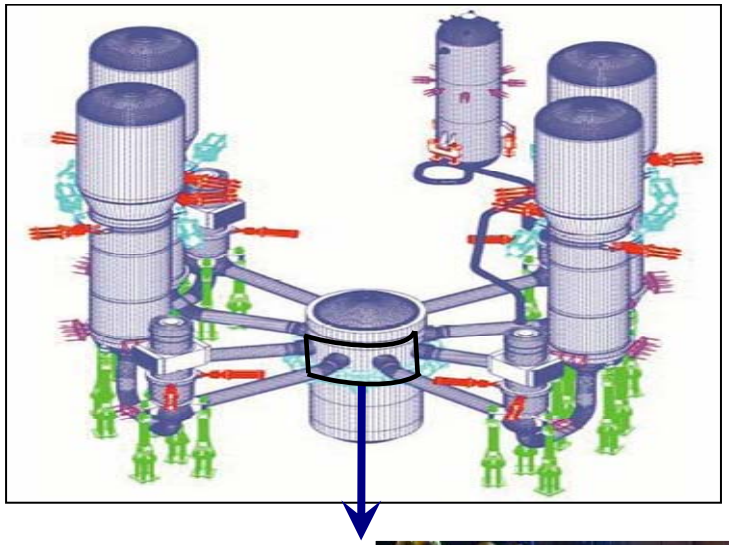
Equipment & Commodities for First Eight Commercial Plants

- Up to 20,000 high quality valves
- Up to 2,000 high quality pumps
- Over 200,000 ft quality pipe
- Over 1,800 miles of cable
- 4 million cubic yds of concrete
- 500,000 tons of steel
- 700,000 electrical components

Source: NEI Manufacturing Workshops
Columbia, SC 3/08
Cleveland, OH 4/08

Fabrication Sources

U.S. EPR #1 forgings are currently in production at Japan Steel Works (JSW)

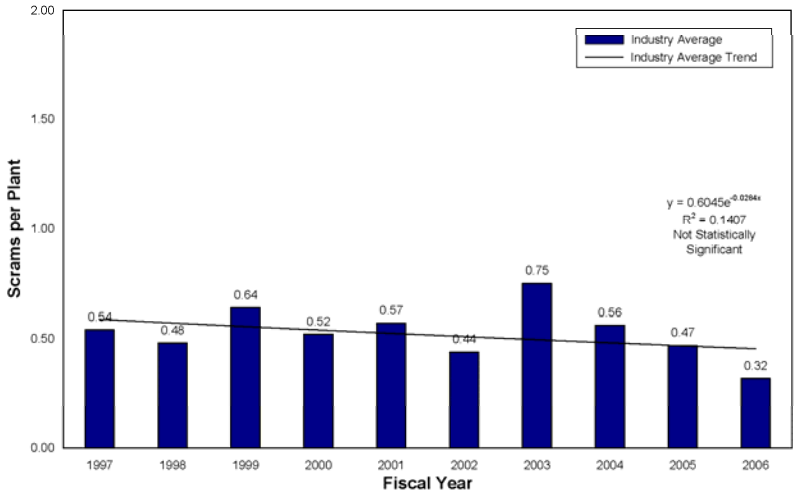


Nozzle shell forging for U.S. EPR #1

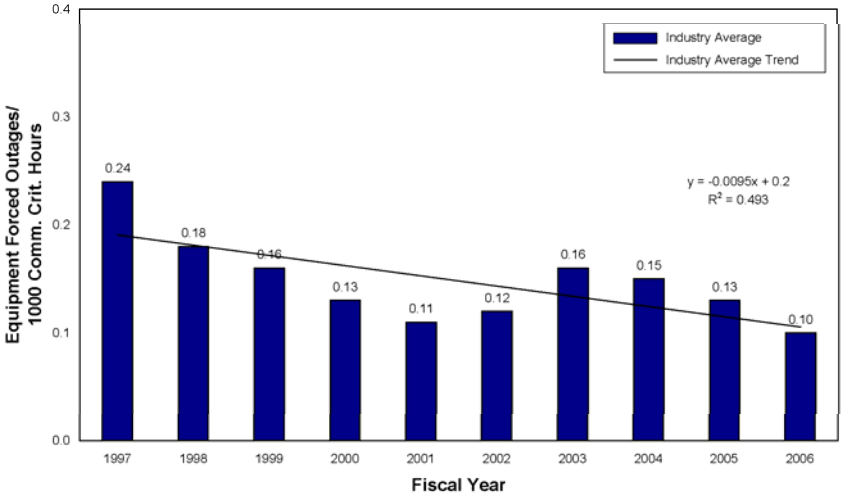
Source: Unistar

High Performance Standards

Automatic Scrams While Critical

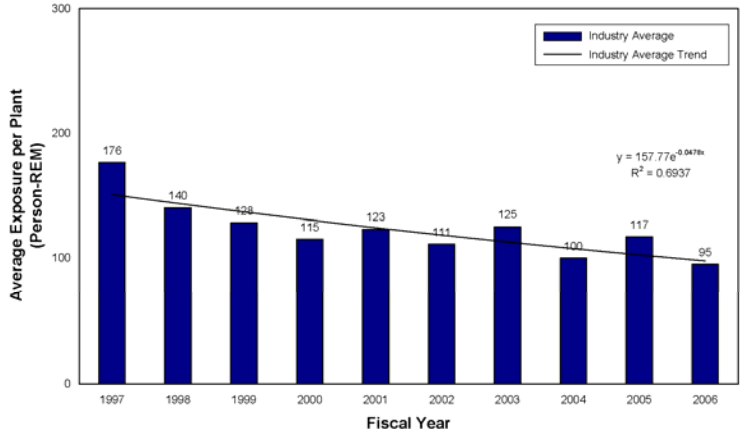


Equipment Forced Outages/1000 Commercial Critical Hours



Source: Nuclear Regulatory Commission Office for Analysis and Evaluation of Operational Data, 4/08

Collective Radiation Exposure



Addressing Proliferation Concerns

- Physical solutions
  - Continue current barriers (guns, gates, & guards)
  - Reduce inventory of weapons-grade material by fission in power reactors
  - Implement advanced fuel cycles
- Political solutions (proposed by GNEP)
  - Prohibit reprocessing facilities in additional countries
  - Prohibit enrichment facilities in additional countries
  - Establish centralized world-oversight of all weapons-grade material

Physical Solutions - Barriers

Barriers

No-Man Zones

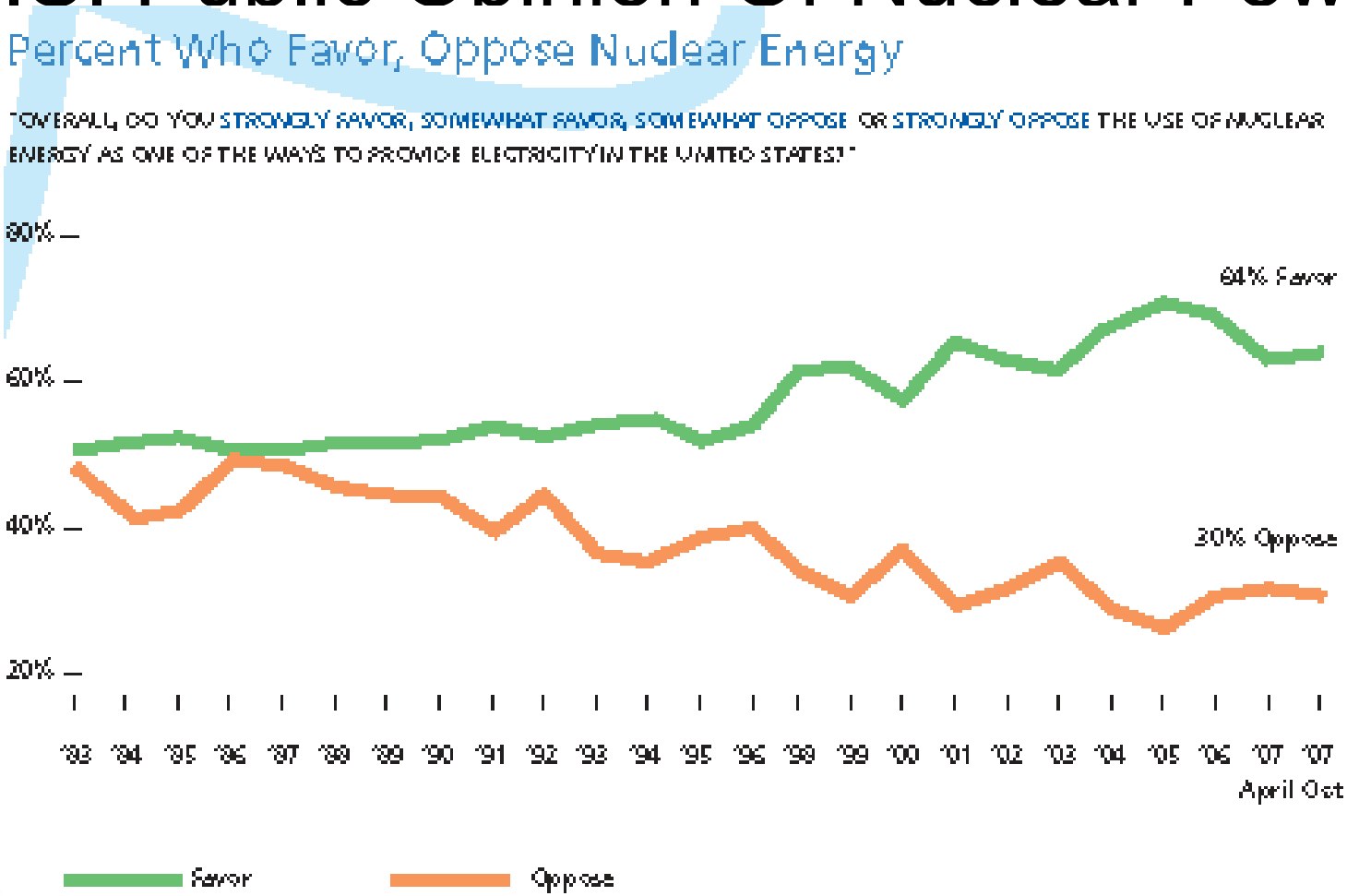
Surveillance

Guards

Gates

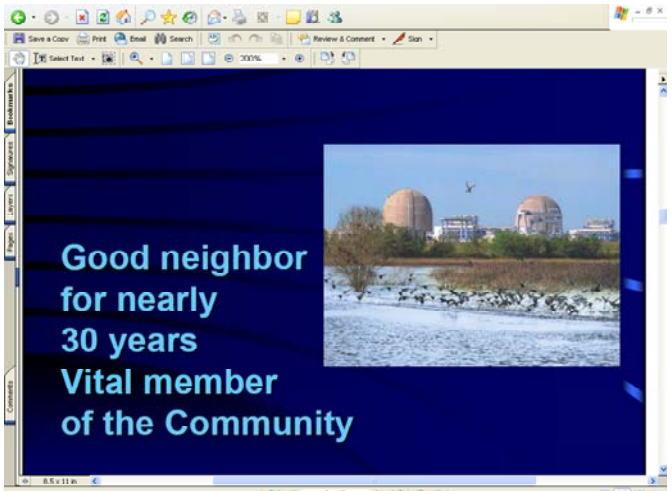
Guns

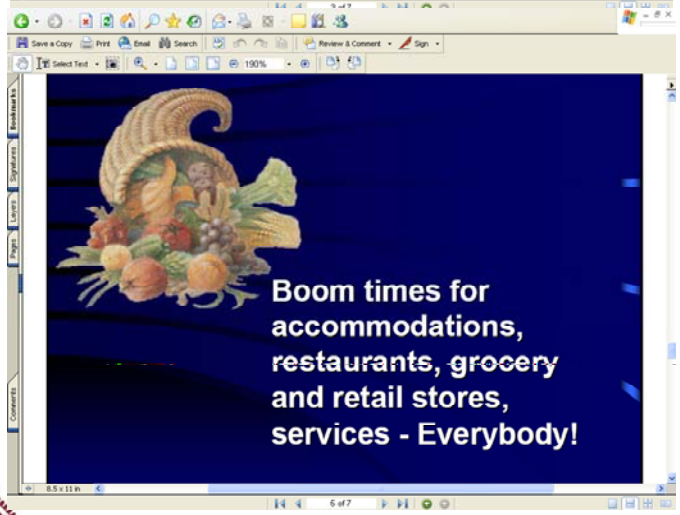
U.S. Public Opinion Of Nuclear Power

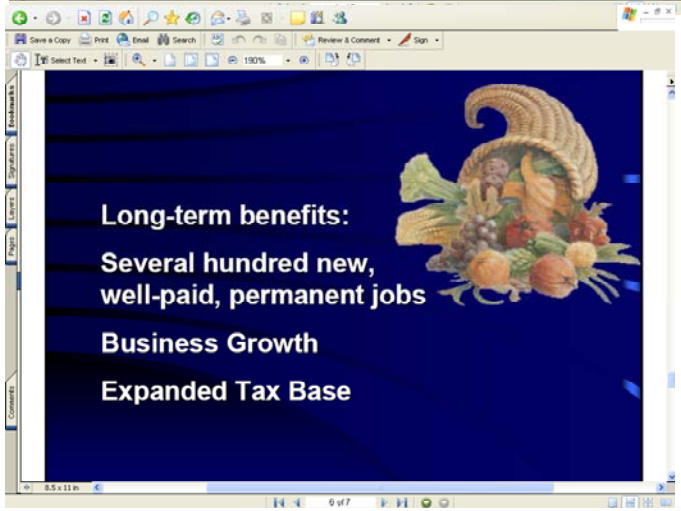


Source: Bisconti Research
12/07

Public Opinion – NPP Neighbors





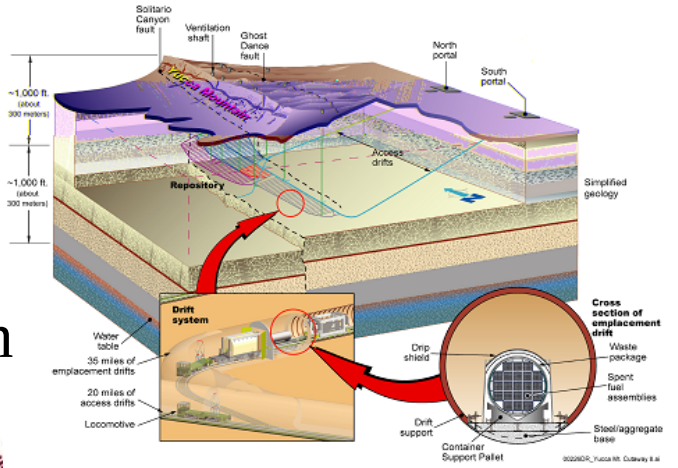


Source: Presentation by Mayor of Bay City Texas, Location of South Texas Project NPP

Nuclear Waste Disposition

Short-Term On-Site Storage at NPPs

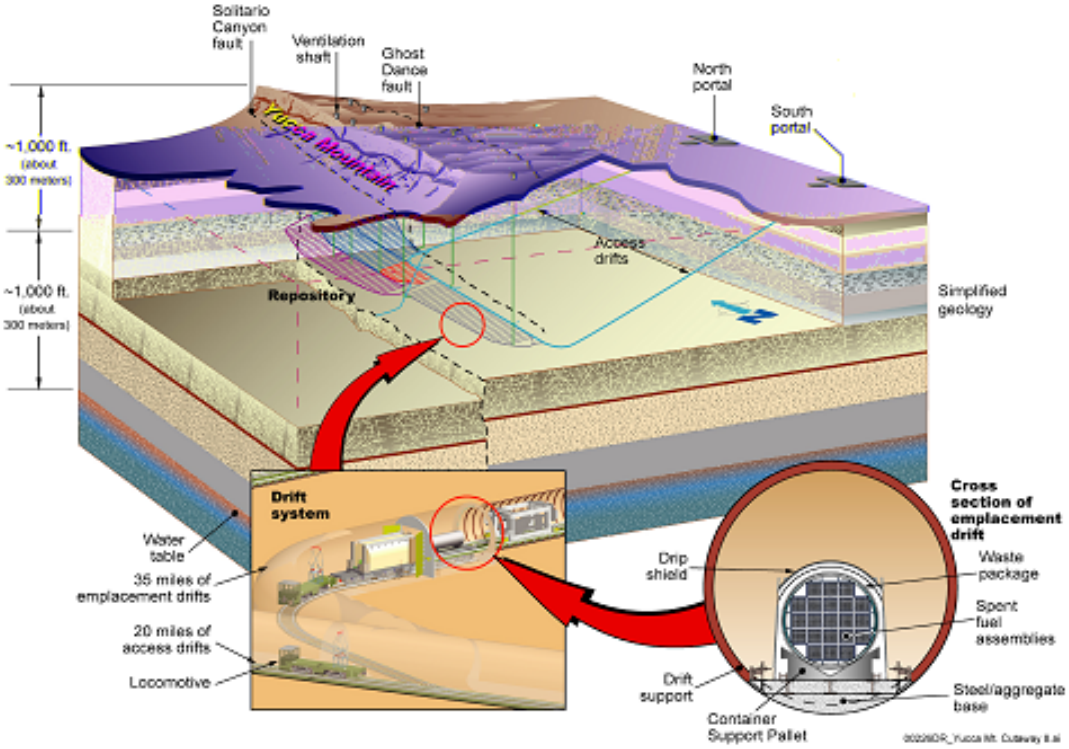
Long-Term Storage Yucca Mountain



Ultimate Options:

- Fuel Reprocessing
  - Recycle Fissile Material
  - Transmute High Level Waste
  - Vitrify Residual Waste
- As demonstrated currently in France, Russia, Japan and previously in USA

License Yucca Mountain



Current projection for license application

Submit

Summer 2008

Open

2017 ?

2021 ?

Address Nevada political resistance to Yucca Mountain by demonstrating support of Nevada state goals

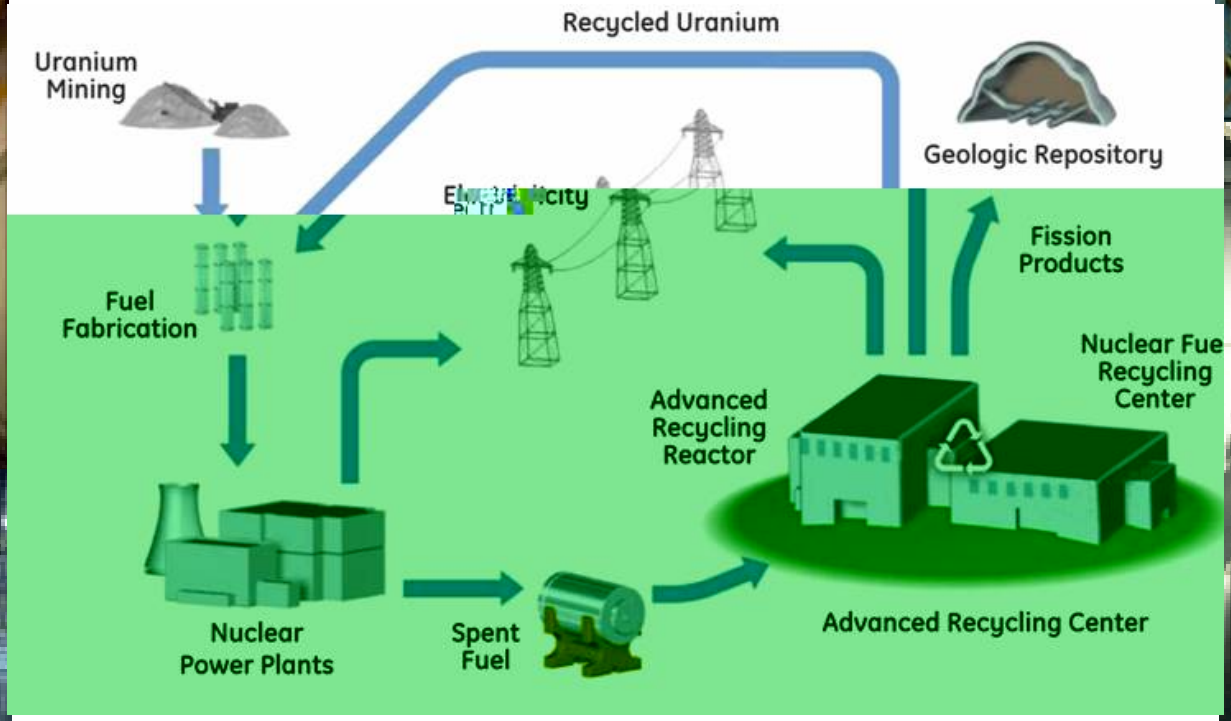
- Synergism with gaming tax income
- Boost of local employment
- National leadership position
- No negative impact on tourism

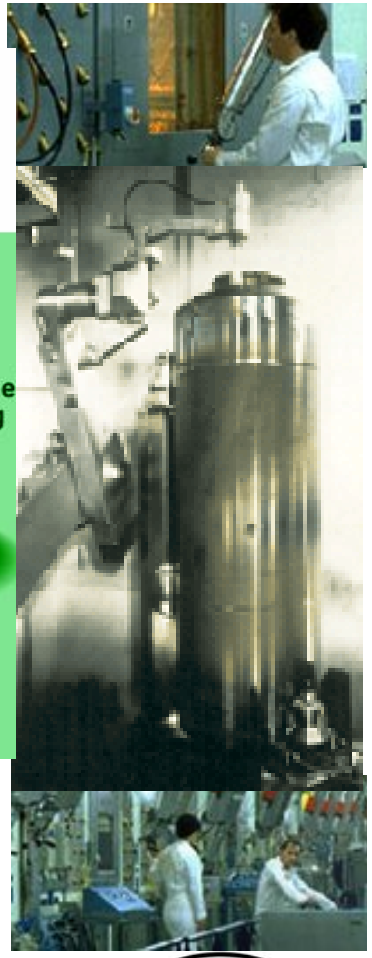
WIPP Has Operated for 8 Years

"The Salado Salt Formation (WIPP) can take as much nuclear waste of any type from anywhere for the next ten thousand years."

James Conca
UNM

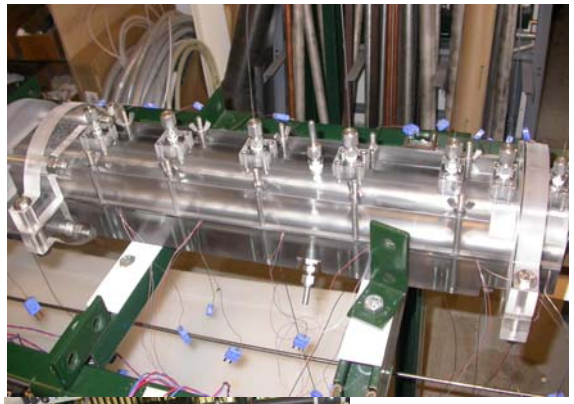
Close The Nuclear Fuel Cycle

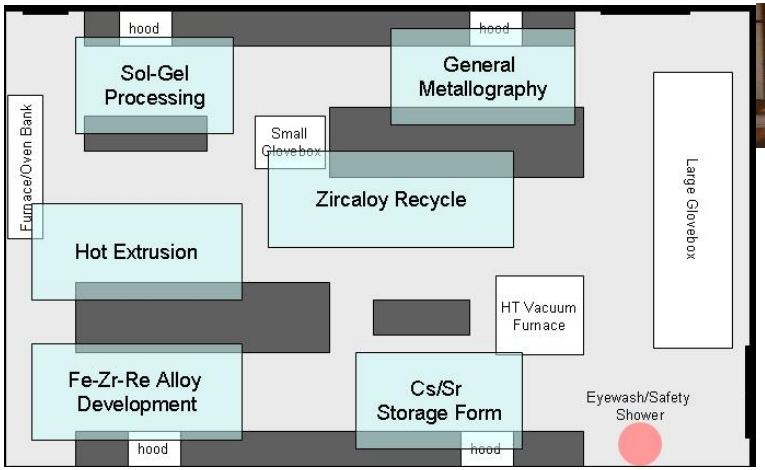


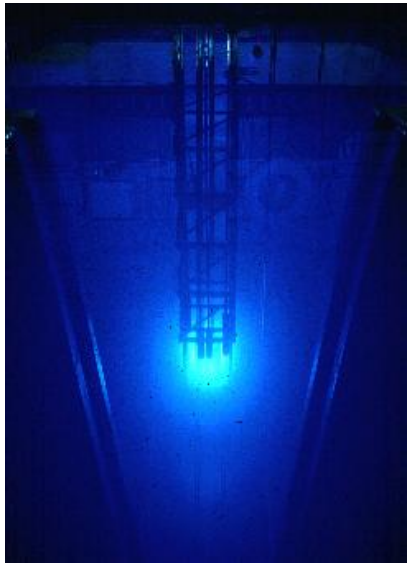


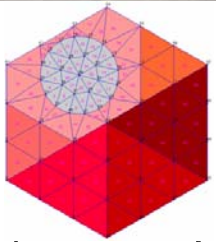
- **Re-establish reprocessing**
- **Establish recycling (with or without MOX and advanced reactors)**
- **Define HLW forms**
- **Establish geologic repository**

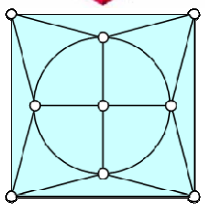
Texas A&M University
Nuclear Engineering Research

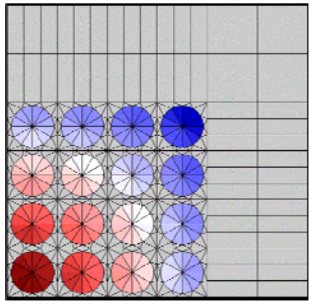






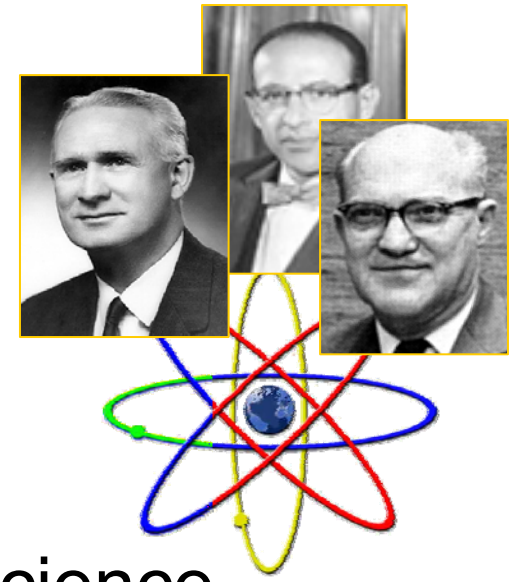






Advantages of ANS Membership

- Provides you a professional home and an extensive peer network



- Recognizes your contributions to the advancement of nuclear science, engineering, and technology (NSET)

Advantages of ANS Membership

- Provides you with many forums to exchange technical information
- Serves you as a credible source of technical information

Advantages of ANS Membership

- ANS professional divisions
  - provide peer review of new NSET developments
  - advance NSET at topical meetings and workshops

- ANS public policies and public information
  - inform the Public
  - assist Government in developing sound policies

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AMERICAN NUCLEAR SOCIETY A N S

QUESTIONS AND DISCUSSION

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