

# ENERGY REGULATORY AND MARKET DEVELOPMENT FORUM

June 26, 2008

**“ENERGY COMPETITION AND REGULATION:  
THE U.S. EXPERIENCE”**

**Sydney, Australia**



**The Honorable Joseph T. Kelliher  
Chairman  
Federal Energy Regulatory Commission**

# Competition Policy



- Competition is at heart of U.S. energy policy relating to wholesale power and gas markets
- Competition policy not new – established 30 years ago
- Competition policy not “deregulation”
- FERC never stopped regulating wholesale power and gas markets
  - Nature of regulation changed
  - FERC role different – larger in some respects
- Competition policy has been success in both power and gas markets
- Competition assured security of U.S. electricity and natural gas supply at reasonable cost for 25 years

# Competition Policy



- Competition policy involves mixture of competition and regulation – seek best possible mixture
- Competition and regulation have different strengths and weaknesses
  - Costs: profit level regulation vs. cost control
  - Rules of the road
  - Investment: regulatory risk vs. contract certainty and reliance on market rules
  - Technology
  - Efficiency
  - Risk allocation: consumers vs. market participants
- Competition policy not an event – it is a process

# Competition Policy



- How FERC introduced competition into wholesale power and gas markets
  - Open access to the networks
  - Functional unbundling
  - Deregulation of most wholesale gas sales
  - Market based pricing for wholesale power sales
  - Encourage greater infrastructure investment
  - Encourage new entry by power generators and gas producers
  - Increased transparency
  - RTOs/ISOs

# Competition Policy



- Power and gas markets highly dynamic – static regulatory policy unlikely to succeed
- FERC pursues steady reform to strengthen competitive markets
  - Encourage entry
  - Improve market access and grid access
  - Establish good market rules
  - Prevent market power exercise and market manipulation
  - Assure effective enforcement
  - Improve market transparency
  - Provide contract certainty
  - Reinforce the networks
  - Improve demand response

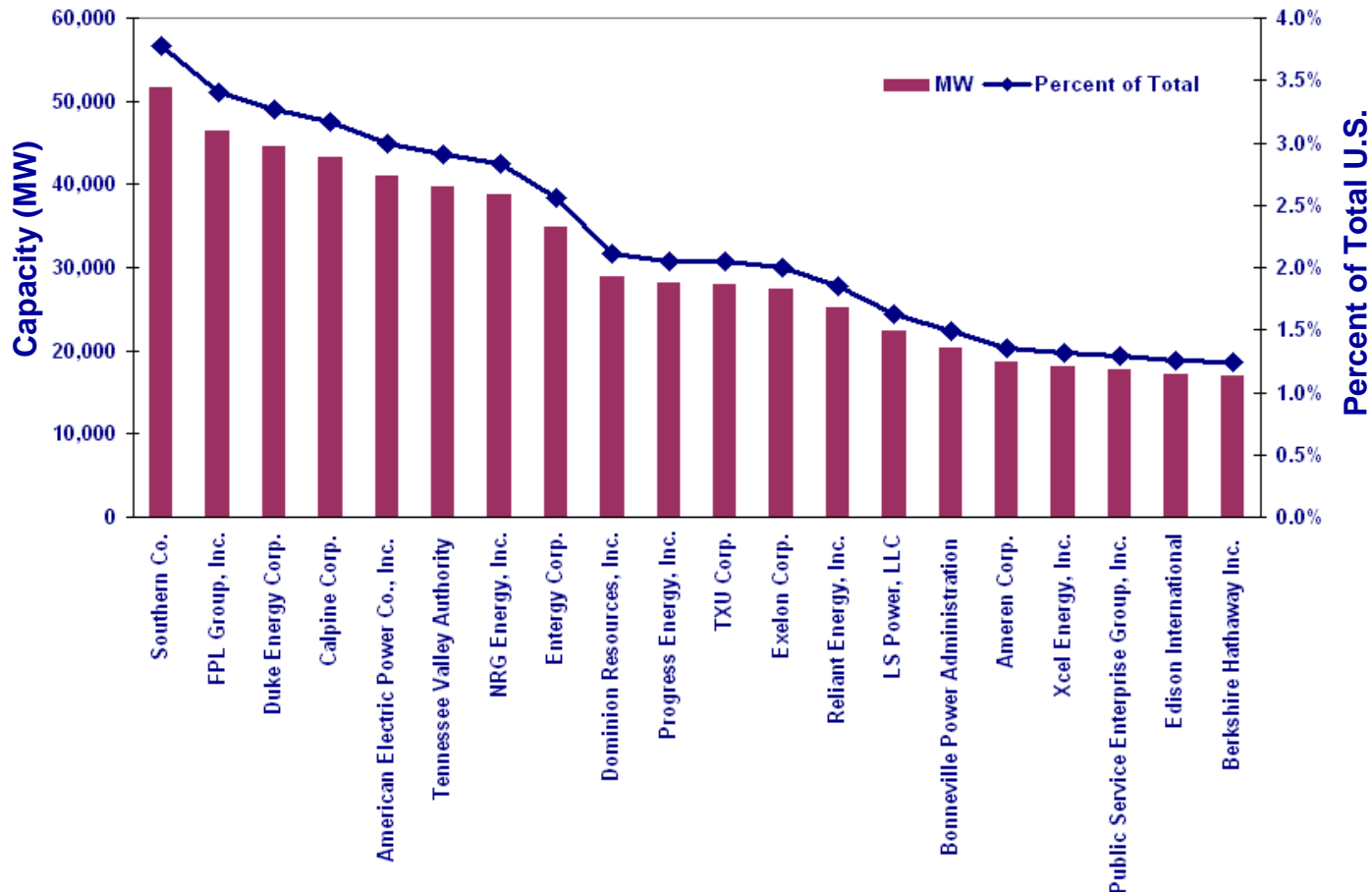
# FERC Regulatory Role



- U.S. electricity regulation – federalist
  - Federal and state regulation
- FERC has five principal missions:
  - Economic regulation
  - Infrastructure development
  - Safety (hydro, LNG)
  - Grid reliability
  - Enforcement
- FERC regulatory authorities
  - Wholesale power and natural gas sales
  - Electric transmission and gas transportation
  - Electricity mergers and corporate transactions
  - Regional power market rules
  - Natural gas pipeline, storage, and LNG siting
  - Limited authority to site electric transmission
  - Police market manipulation
  - Grid reliability standards

# **Overview of U.S. Electricity Markets**

# U.S. Electric Generation Ownership



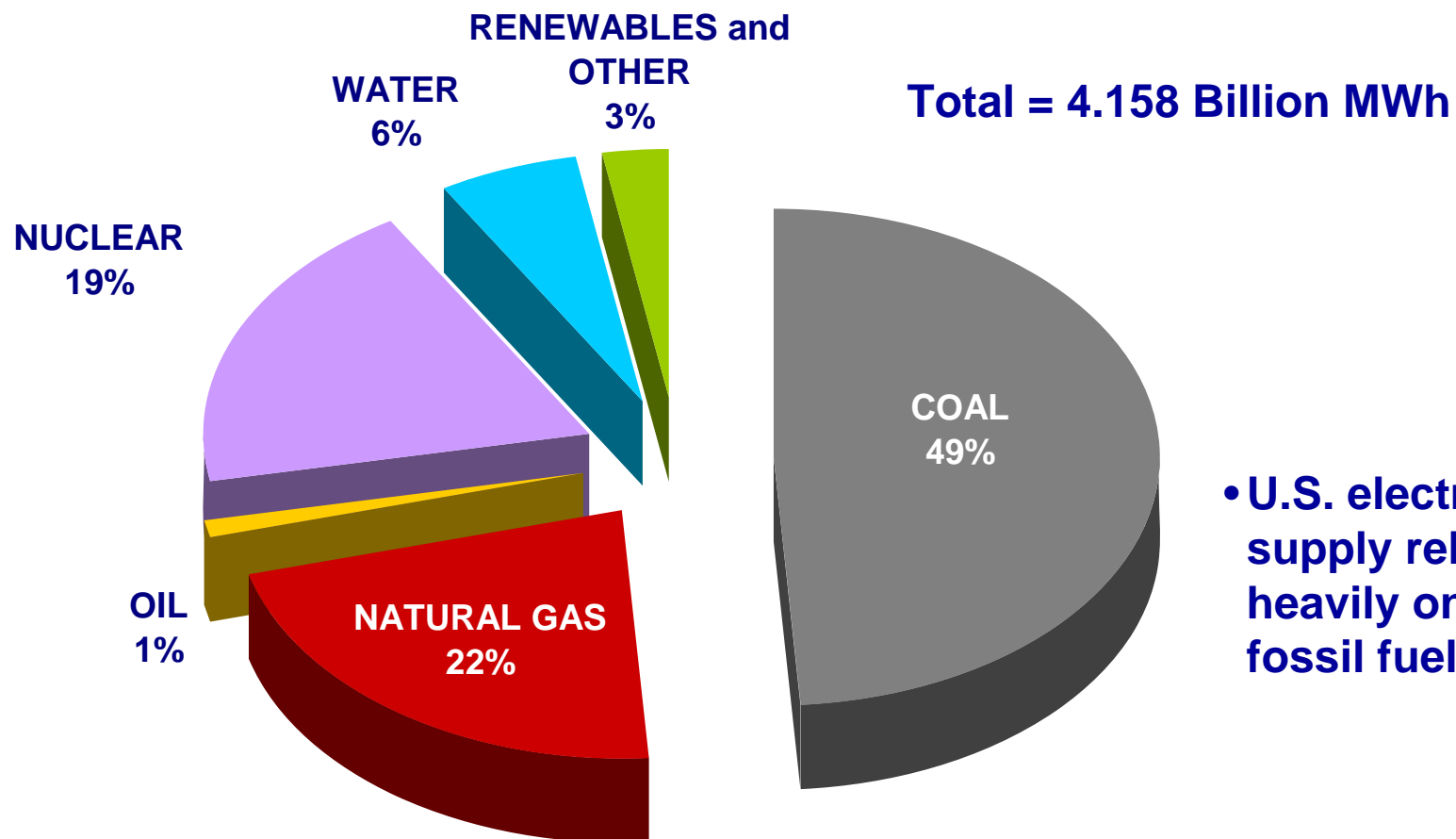
- U.S. is world's largest electricity generator
- Disaggregation of generation ownership

Source: Derived from Platts Powerdat.

Note: Only generation facilities with a nameplate capacity of 20 MW and greater were included.

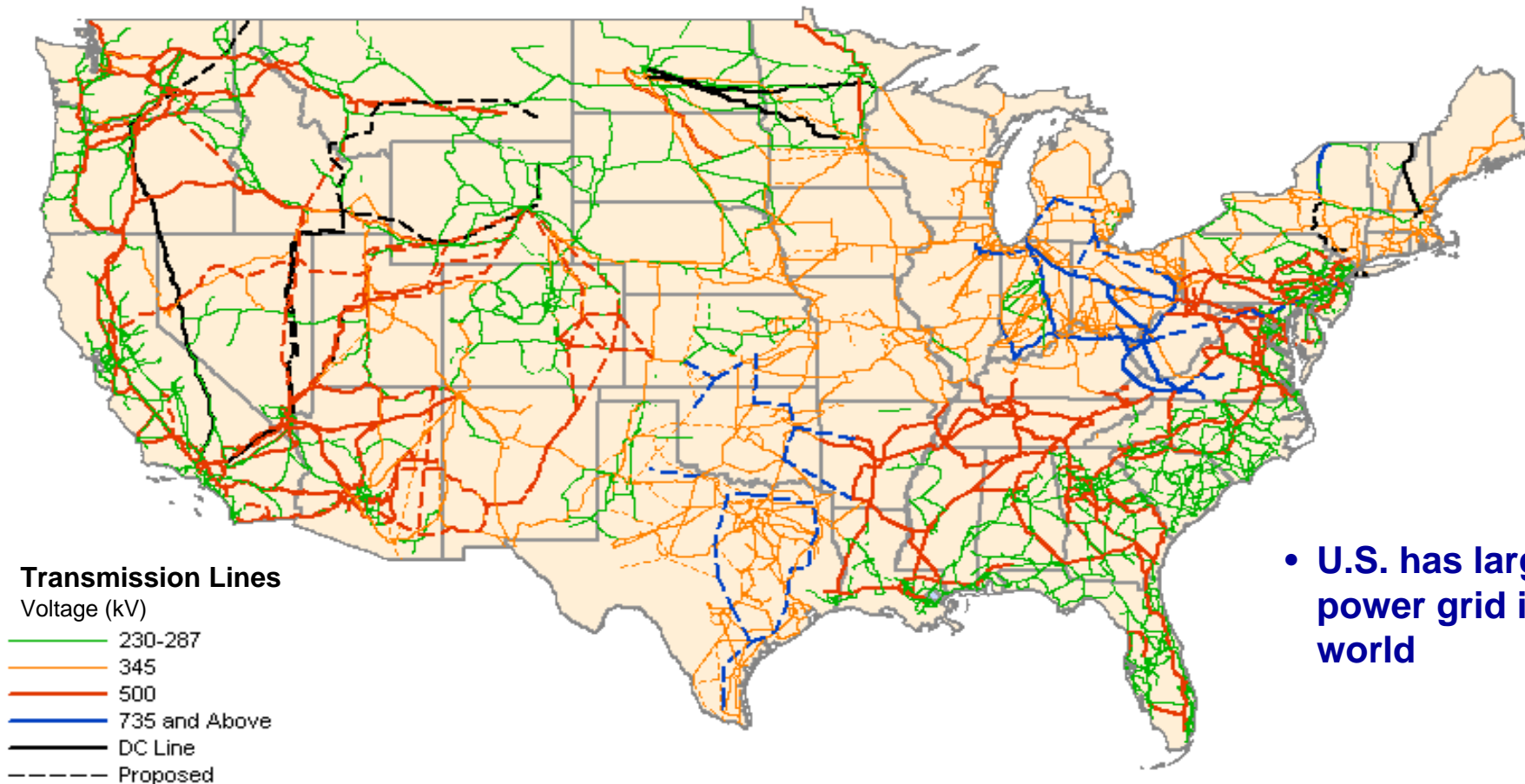


# U.S. Electricity Supply Mix 2007



Source: Based on data from Global Energy Decisions, LLC, Velocity Suite, June 2008

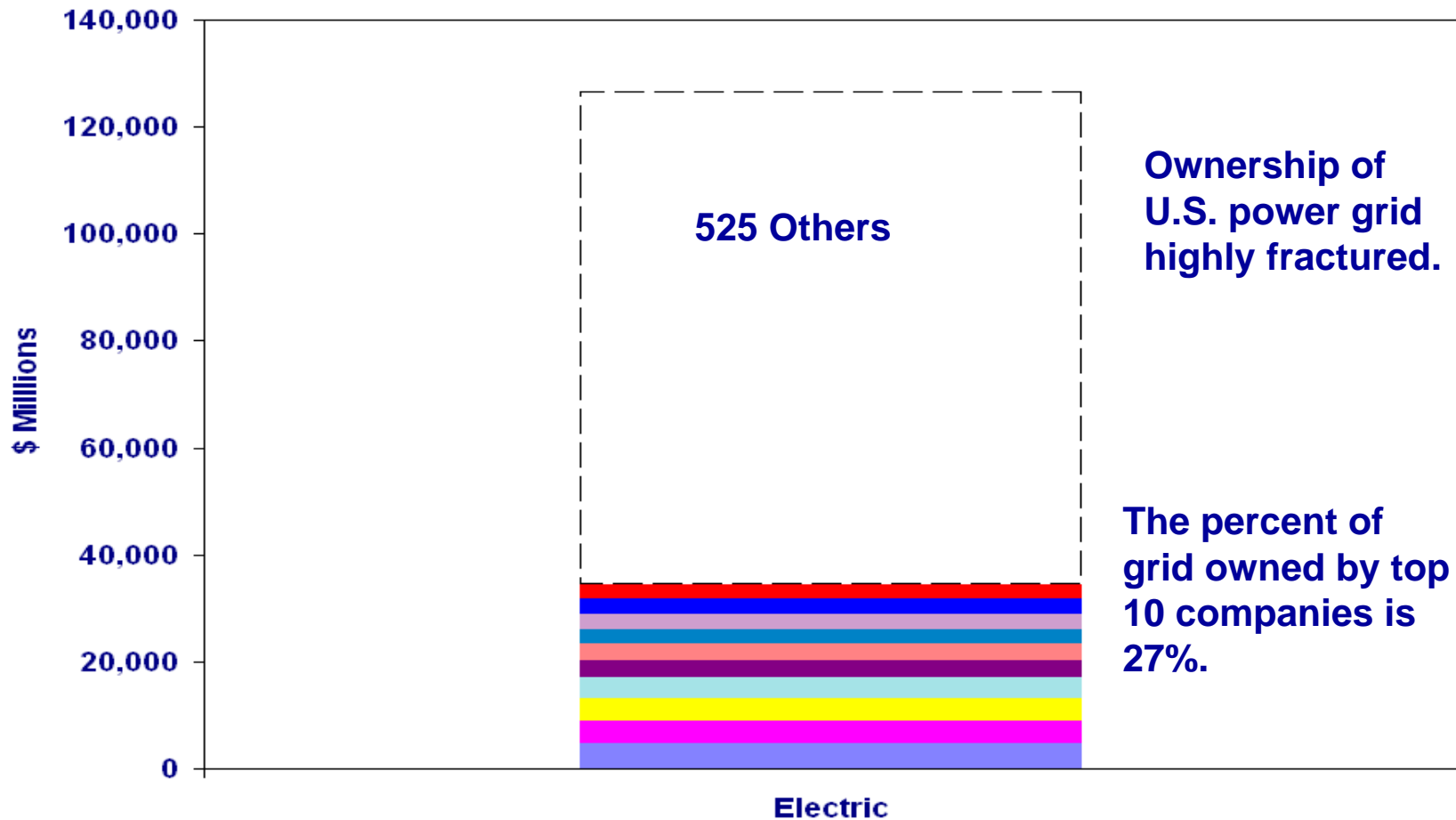
# U.S. Interstate Power Grid (163,480 Circuit Miles or 263,096 Km)



- U.S. has largest power grid in world

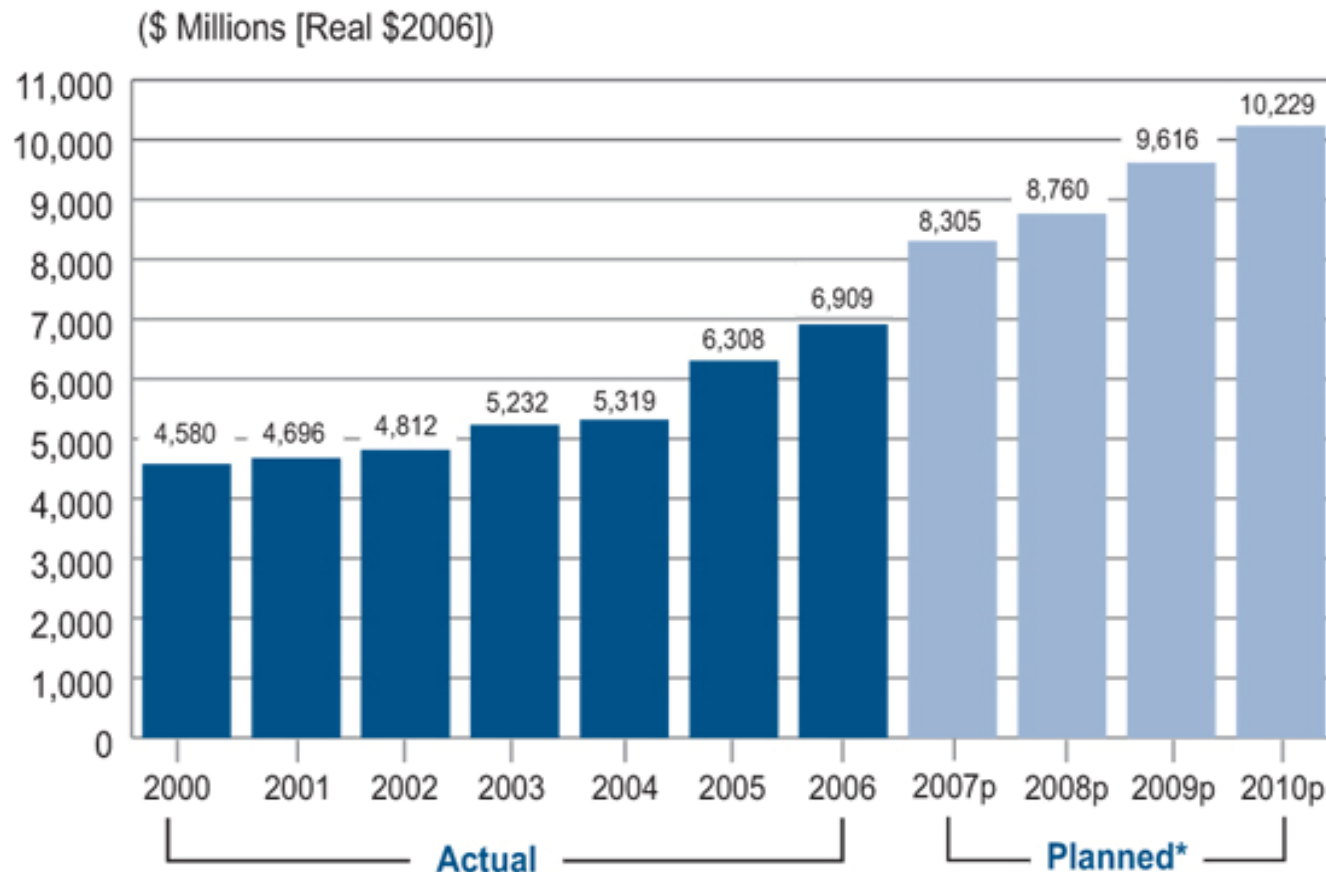
Source: Based on data from Global Energy Decisions, LLC, Velocity Suite, June 2008

# U.S. Electric Transmission Ownership



Source: Platts PowerDat, Financials, Balance Sheet, End of Year 2005 Transmission Plant in Service

# U.S. Transmission Investment



- Sustained period of underinvestment
- Policies designed to encourage greater grid investment
  - Rates of return
  - Regional transmission planning
  - Regional cost allocation
  - Federal siting

Source: Edison Electric Institute. Actual and Planned Transmission Investment by Shareholder-Owned Electric Companies (2000-2010). [http://www.eei.org/industry\\_issues/energy\\_infrastructure/transmission/index.htm](http://www.eei.org/industry_issues/energy_infrastructure/transmission/index.htm)

# U.S. Regional Power Markets



- U.S. does not have a national electricity market
- Regional power markets – some of which are also international
- Hybrid markets: 3 different wholesale market regimes
  - RTOs/ISOs: centralized day ahead markets, bilateral markets, financial trading, large trading volumes, good transparency
  - West: bilateral spot markets, large trading volumes, good transparency
  - Southeast: bilateral spot market for residual power, low trading volumes, poor transparency

# Electric Industry Structure



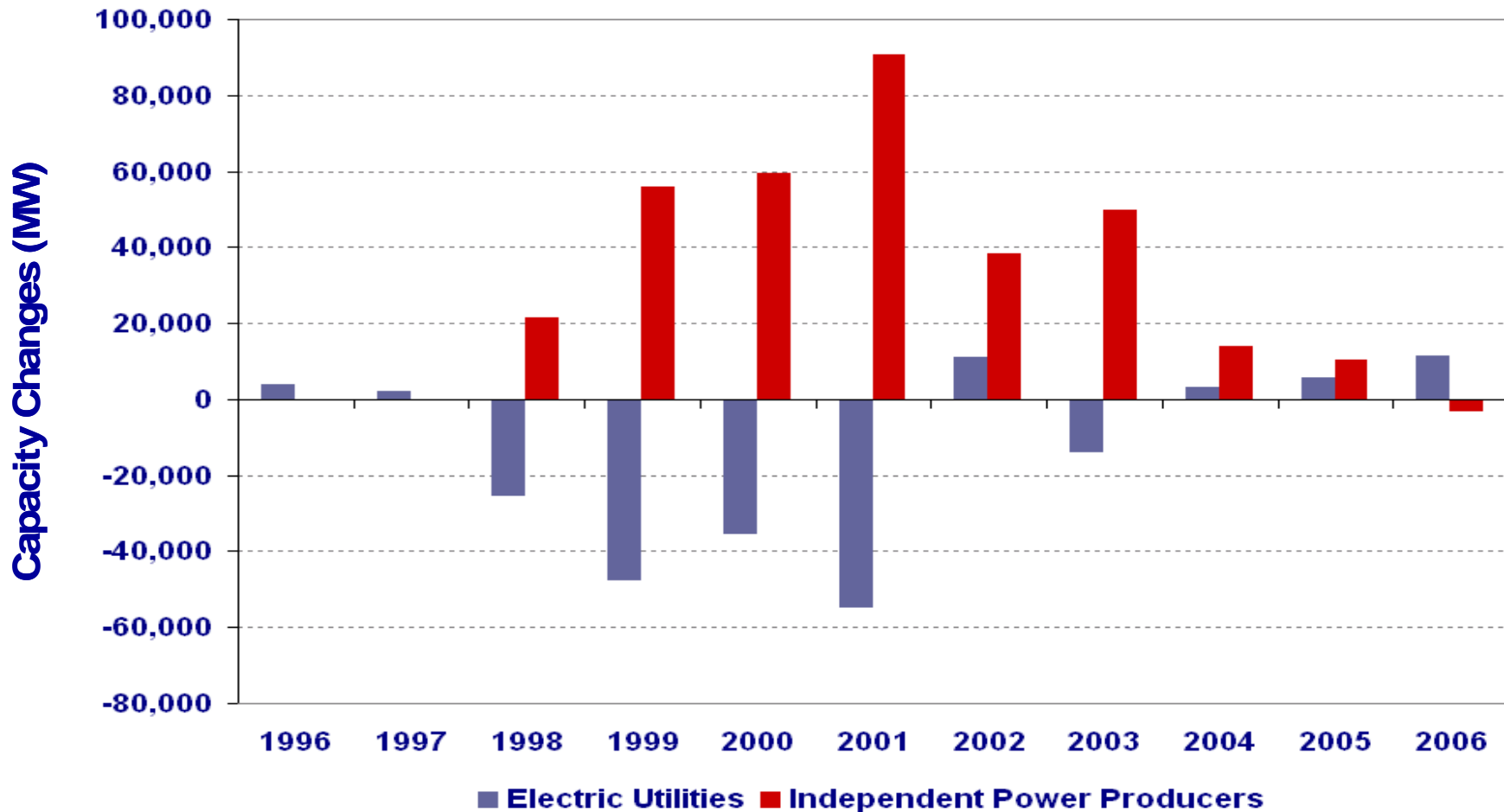
- Competition
  - Generators – utilities and independents
- High level of vertical integration
- Diversity
  - Investor owned utilities
  - Federal utilities
  - State and municipal utilities
  - Rural electric cooperatives
  - Independent power producers
  - Transcos
  - Traders and marketers

# Competitive Markets



- **U.S. wholesale power markets working well**
- **Competition policy a success**
- **Competition has assured security of U.S. electricity supply for 25 years**
- **Some failures: California and Western crisis**
- **Difficult to define “success” – what is proper benchmark?**
  - **Price is not best measure – driven by fuel and capital costs**

# U.S. Electricity Supply Additions: 1996 – 2006



Source: EIA Electric Power Annual, October 2007



# Competitive Markets



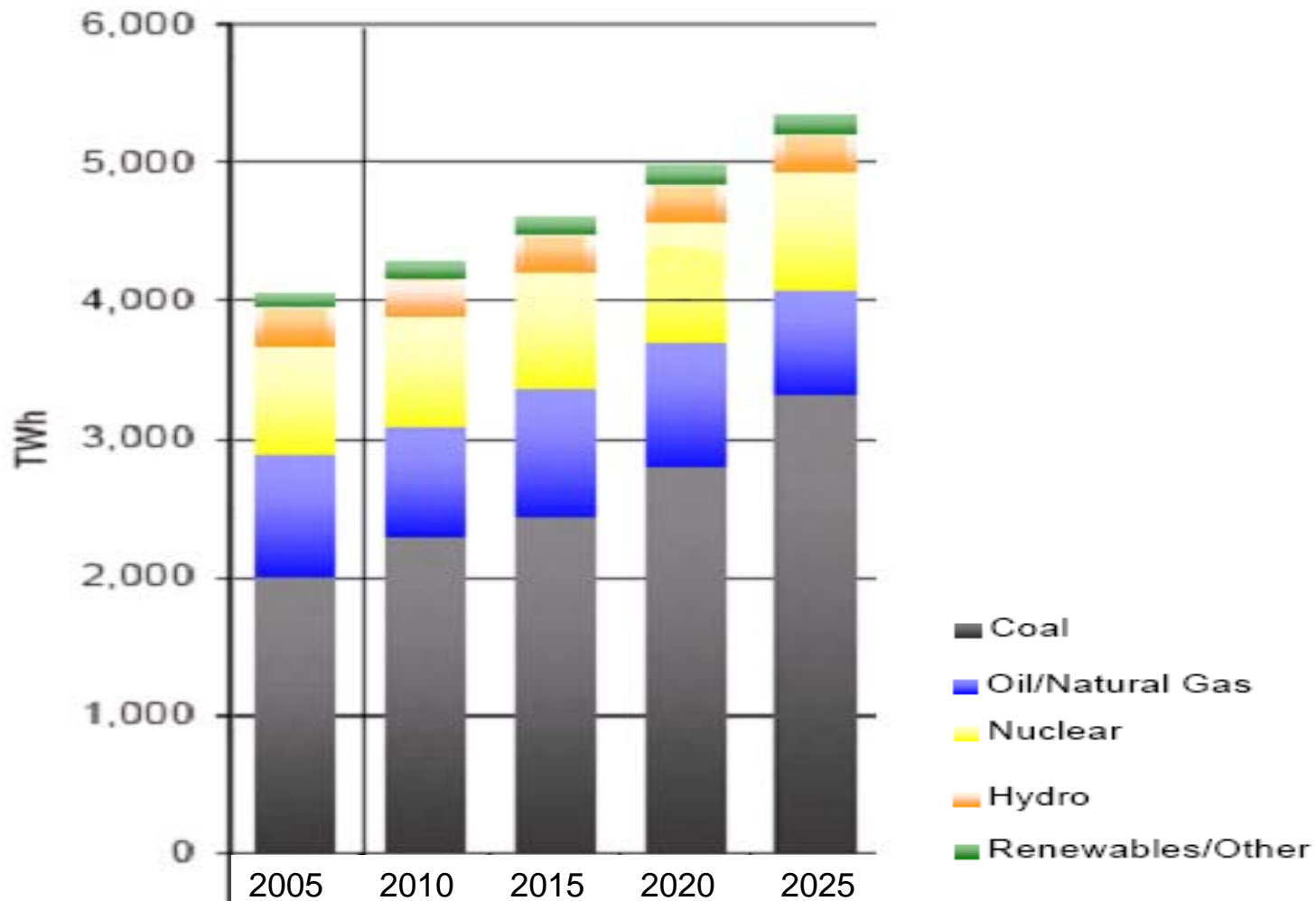
- Characteristics of competitive markets
  - Generation entry
  - Market access
  - Grid investment
  - Market transparency
  - Efficiency/operating performance
  - New products/services
  - Generation fuel diversity
  - Robust power grid
  - Grid access
  - Demand response
  - New technologies
- U.S. wholesale markets have most of these characteristics
- Wholesale power markets under stress from higher costs
  - Capital costs
  - Fuel costs

# Security of U.S. Electricity Supply



- Two great challenges facing U.S. electricity sector
  - Security of electricity supply
  - Climate change
- Competition policy best suited to assure security of electricity supply at reasonable cost – not low cost
- U.S. poised on edge of large generation build, perhaps larger than generation build between 1996 and 2004

# Projected U.S. Electricity Supply and Demand



Source: EPA  
Analysis of  
Lieberman-Warner  
Climate Security  
Act of 2008

# Security of U.S. Electricity Supply



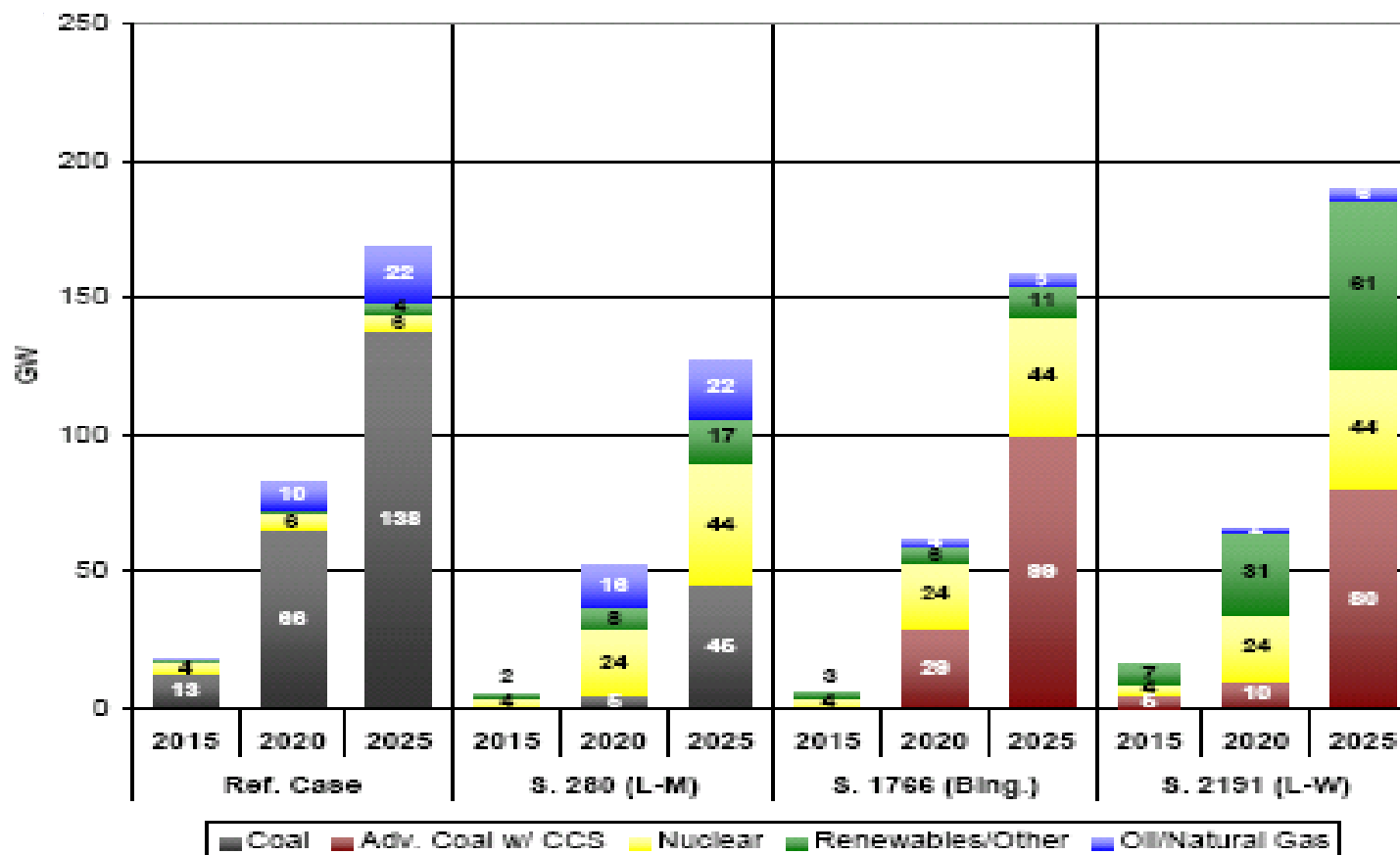
- Tremendous investment needs (between 2010 and 2030)
  - Generation – \$560 billion (no carbon policy change); \$751 billion (advanced coal technologies and sequestration); \$531 to \$457 billion (energy efficiency improvements)
  - Distribution - \$ 673 billion
  - Transmission - \$ 233 billion
- Investment must occur in high cost environment
- What is best means to assure security of supply?
  - Traditional rate regulation
  - Competition
- U.S. adopted competition policy in reaction to failure of traditional regulation to contain costs in 1970s-1980s
- Competition better suited to support necessary investment and contain costs

# Climate Change



- Question: not whether U.S. will change course – how and when
- Tension between assuring security of electricity supply and climate change
- Uncertainty about climate change policy comes at cost – and may continue
- Very difficult to address both challenges at the same time – not impossible
- What must U.S. do well to meet climate change challenge?
  - Energy efficiency and demand response improvements
  - Technology development and deployment
  - New generation entry
  - Generation fuel diversity
  - High investment level
  - Improvements in operating performance
  - Infrastructure expansion – wind, cost
- All areas where competition delivers superior results

# New Generation Capacity



# Climate Change

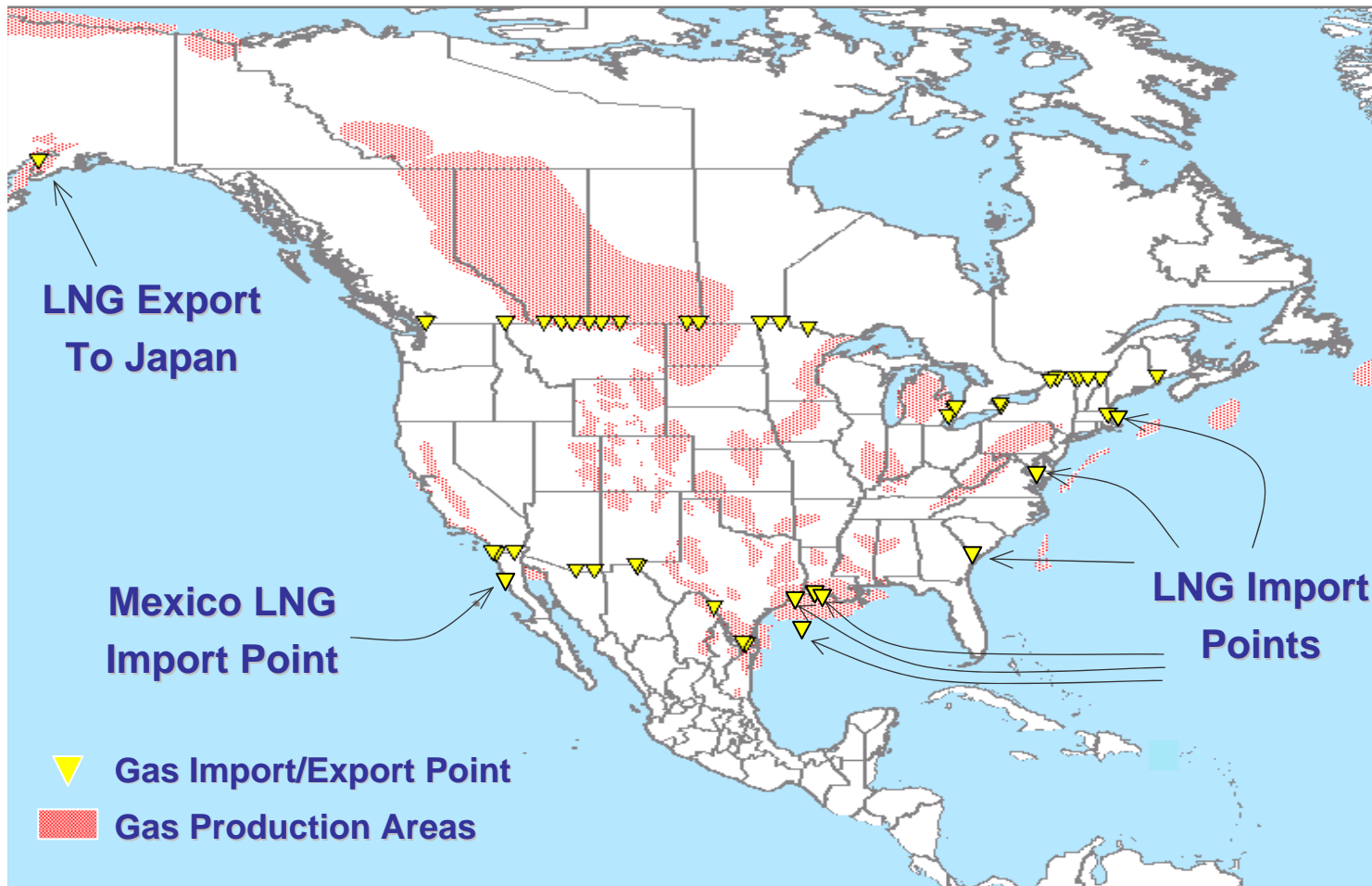


- Climate change action will come at a significant cost
- Whether costs are reasonable or unreasonable depends on balance between energy and environmental policy
  - Usually no balance
  - Necessary here – climate change is energy policy, not just environmental policy
  - Options – sound energy policy, some acceptable, others reckless
  - If we address climate change in manner that is unsound energy policy result will be high energy prices, unreliable energy supplies
- Risk of undermining public confidence in climate change action

# Overview of U.S. Natural Gas Markets

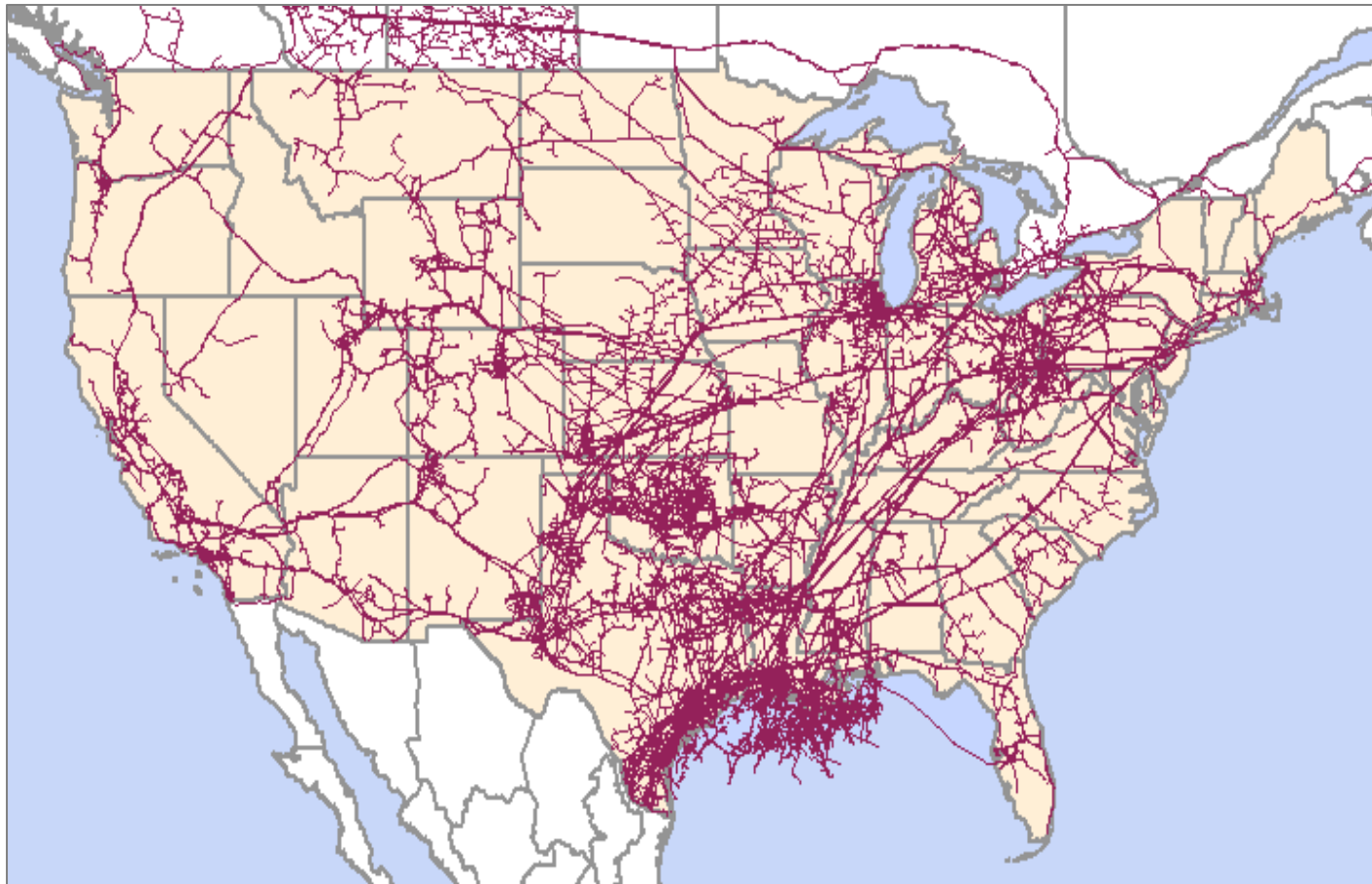


# US Sources of Gas Supply



- Largest gas consumer and second largest producer
- Relatively self-sufficient – U.S. produces 83% of supply
- Canadian imports declining
- LNG fastest growing source of gas supply

# U.S. Natural Gas Pipeline Network



## Gas Market:

- Largest, most liquid, and most transparent

## Pipeline Network:

- Largest gas pipeline network (300,000 miles or 480,000 km)
- Interconnected with Canada and Mexico

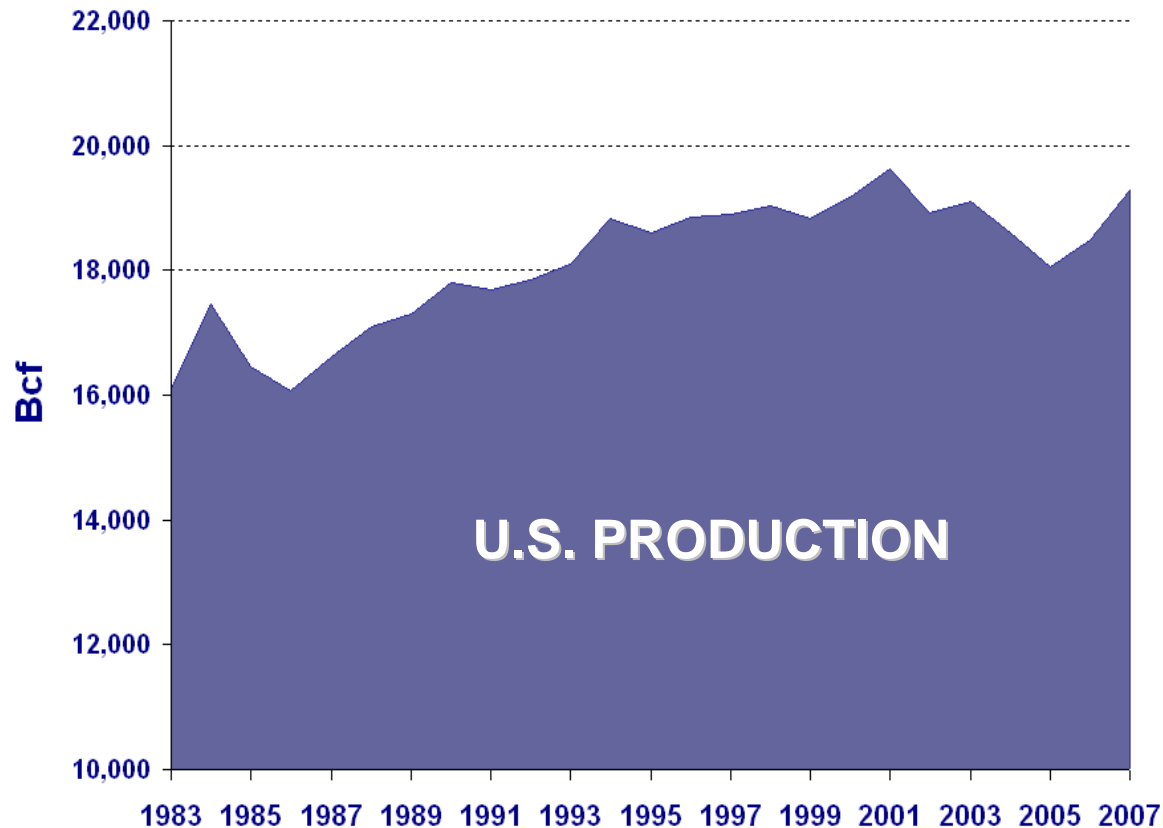
Source: Based on data from Global Energy Decisions, LLC, Velocity Suite, June 2008

# Gas Industry Structure



- Disaggregation of gas production
- Much lower level of vertical integration
- Ownership separation of pipelines from producers and distribution
- Ownership of gas pipelines more concentrated

# U.S. Gas Production from 1983 through 2007



- Success of competition policy: U.S. natural gas production
- Price controls led to steady decline in gas production
- Decline not caused by declining reserves but by regulatory policy
- Price decontrol led to rebound of U.S. gas production

Source: EIA's U.S. Natural Gas Gross Withdrawals and Production - Annual.

# Security of U.S. Natural Gas Supply



- U.S. maintaining current levels of production – 10% rise
- High prices result in very active exploration and production
- U.S. demand growing more quickly
- One strength of U.S. gas market – robust infrastructure
- Development of robust pipeline network
  - Efficient administration by FERC
  - Good rates of return
  - Functional unbundling – pipeline competition– ownership separation
- Canadian imports no longer sufficient to make up shortfall
- U.S. relying increasingly on LNG to meet domestic demand – LNG fastest growing source of US gas supply

# Wholesale Gas Markets



- U.S. wholesale gas market working very well
- Fundamental change – transition from North American market
- North America in competition with Europe and Asia/Pacific for LNG – many differences among LNG import markets
- U.S. has certain advantages in competition for LNG
  - U.S. gas market: world's largest, most liquid, most transparent
  - Properly values seasonality of gas
  - Significant domestic gas production
  - Large gas storage capacity
  - Largest pipeline network in world
  - Ready access to both Atlantic and Pacific LNG markets
  - Contract certainty
- LNG pricing: LNG is a commodity, unlike most commodities priced regionally
  - Probably unsustainable – international pricing
- Convergence between gas and power markets
- Convergence between gas physical and financial markets.



# Conclusion

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- Policy choices governed by industry structure and regulatory regime
- Competition policy has followed different courses in power and gas markets, given differences in these markets
- U.S. experience: competition policy has been a success – assured security of electricity and gas supply at reasonable cost for 25 years
- U.S. remains committed to competition policy
- Focus at FERC – strengthening competitive wholesale power and gas markets, through steady reform