

# Energy Market Reform Efforts in the US

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## *Mission Statement*

*The WUTC protects consumers by ensuring that utility and transportation services are fairly priced, available, reliable, and safe.*

WUTC – Kyrgyz Republic Partnership

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# Natural Gas Regulation

## The Early Days

- In the mid-1800s natural gas was mostly made from coal in the city in which it was consumed
- Monopoly characteristics of the gas industry led city governments to regulate retail rates
- Pipelines began to carry gas between cities in the early 1900s. This created a “gap” in local government oversight
- State governments created public utility commissions to regulate the new 'intrastate' gas market, and determine rates of gas distributors.

# Natural Gas Regulation

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## The Beginnings of Federal Involvement

- Around 1910, interstate natural gas pipelines began moving gas between states
- As early as 1911, states asserted regulatory oversight of interstate pipelines.
- However, the U.S. Supreme Court found that interstate pipeline companies were beyond the regulatory power of state government
- This created a second regulatory gap

# Natural Gas Regulation

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## The Federal Natural Gas Act (NGA) of 1938

- The federal government began to regulate interstate gas with passage of the NGA
  - Empowered the Federal Power Commission (FPC) to regulate interstate gas rates
    - 'just and reasonable' standard
    - FPC was created in 1920 with the passage of the Federal Water Power Act
  - Did not specify that the FPC was to regulate natural gas wellhead prices
  - Prohibited new interstate gas pipelines in markets served by another pipeline

# Natural Gas Regulation

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## Wellhead Price Regulation

- During the early 1940s, the Supreme Court determined that wellhead prices were subject to federal oversight if the producer and the pipeline were affiliated companies.
- In 1954, the Supreme Court expanded federal oversight to all producers selling natural gas to interstate pipelines
  - This meant that wellhead prices for gas sold into the interstate market would be regulated
  - Phillips Petroleum v. Wisconsin (347 U.S. 672, 1954)

# Natural Gas Regulation

## Effect of the Phillips Decision

- From 1954 to 1960, the FPC set rates based on each producer's individual cost
  - The number of producers made this approach unworkable – in 1959, the FPC only acted on 240 of the 1,265 separate cases before it
- In 1960, the FPC divided the US into five separate regions and set rates for each region
- In 1974, adopted a national price of \$0.42 per million cubic feet (mcf).
  - Or \$1.66/mcf in \$2006 - current price \$5.28/mcf
  - \$0.42 was significantly below the market value of gas

# Natural Gas Regulation

## **These price control systems had disastrous effects on the US gas market**

- Gas rates below the market value of that gas resulted in a surge in demand.
- Low rates discouraged new exploration and production
- Only “interstate” prices regulated, so producers maximized sales to “in-state” customers
  - Excess gas in producing states and shortages elsewhere

# Natural Gas Regulation

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## These price control systems had disastrous effects on the US gas market

- In response to shortages, the FPC set 'curtailment' policies
  - Priority schedules for who should receive gas
    - Based on historical use
    - Political factors
  - These policies were very controversial and led to litigation

# Natural Gas Regulation

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## The Natural Gas Policy Act (NGPA) of 1978

- At the peak of the natural gas supply shortages, the US Congress enacted the NGPA
- The NGPA had three main goals:
  - Creating a single national natural gas market
  - Equalizing supply with demand
  - Allowing market forces to establish the wellhead price of natural gas
- The ceiling prices for wellhead gas were to be phased out over time, with complete price deregulation by 1985

# Natural Gas Regulation

## The Effect of the Natural Gas Policy Act

- Pipelines, accustomed to gas shortages, signed long-term natural gas supply contracts
  - Often called “take-or-pay” contracts
- Producers expanded exploration and production, supported by these the long-term contracts
- Average wellhead prices rose following passage of the NGPA
- Price increases led to decreased demand
- By the early 1980’s, these combined events led to excess supply and lower prices

# Natural Gas Regulation

## FERC Order No. 436 of 1985

- FERC (FPC Successor) Order 436, allowed pipelines to offer transportation only service rather than transportation/procurement services
  - Within boundaries, pipelines were allowed to offer competitive transportation rates to their customers
- Effect of this order:
  - All pipelines offered transportation only services
  - Overall customer costs fell, because spot market gas prices were lower than pipelines gas prices
  - Pipelines primary function became transportation
  - Purchasing and transportation options increased

# Natural Gas Regulation

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## **The Natural Gas Wellhead Decontrol Act of 1989 (NGWDA)**

- Complete deregulation of wellhead prices, allowing the market to determine the price of natural gas

## **FERC Order No. 636 Issued in 1992**

- Completed the final steps towards unbundling by making pipeline unbundling a requirement
- Pipelines could no longer engage in merchant gas sales, or sell any product as a bundled service

# Natural Gas Regulation

## Lessons Learned from Gas Regulation

- 100 years of change
  - Regulators must be nimble to adapt to new realities
- Regulations often led to unexpected outcomes
  - Law of unintended consequences
- Current regulatory approach widely regarded as successful
  - focus regulation on areas natural monopoly (i.e., pipelines)
  - allow market mechanisms in areas of competition (i.e., production and purchasing utilities/industries)

# Electricity Regulation in California

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## 1980s

- Electricity provided by vertically integrated public and investor owned monopoly utilities
- Federal PURPA legislation forced utilities to purchase power from independent producers
- PURPA demonstrated that
  - utilities could handle power from outside sources, and
  - Outside sources were a good place to acquire power
- High prices led to ample supply of electricity
  - By 1990, retail rates about 40% above national average (industrial rates \$0.088/kWh)

# Electricity Regulation in California

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## 1992 – Discussions of Deregulation Begin

- High utility rates – uncompetitive industries
  - Low wholesale costs made it attractive for energy intensive industrial customers to by-pass utilities
  - The 1992 Energy Policy Act required Commissions to closely examine the attributes of purchased power
- Other industries benefited from deregulation
  - Trucking, telecommunications, natural gas
  - Circumstances appear similar to those prior to passage of the Natural Gas Policy Act of 1978
- PURPA demonstrated that the industry need not be vertically integrated

# Electricity Regulation in California

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## Decision to Deregulate

- In 1994, the California Public Utility Commission begins a rulemaking to consider approaches to restructuring the state's electricity market.
  - Built on changes to federal law and regulation to encourage more competitive wholesale markets
    - The Public Utilities Regulatory Policy Act of 1978
    - The Energy Policy Act of 1992.
- Codified (with minor changes) by California state legislature with passage of *The Electric Utility Industry Restructuring Act* (Assembly Bill 1890) on September 23, 1996

# Electricity Regulation in California

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## The Deregulated System

- The California Legislature mandated a 10% rate cut/freeze during a four-year transition period
- Investor owned utilities required to “voluntary” divest 50% of their fossil-fueled generation
- Customers could pick their own provider
  - But had to pay competition transition charge (CTC)

# Electricity Regulation in California

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## The Deregulated System

- Two new entities
  - The Power Exchange (PX) administers the day-ahead and hour-ahead spot market
  - The California Independent System Operator (ISO) coordinates scheduling and dispatch power activities
    - objectives included nondiscriminatory access, reliability, and achieving the lowest total cost for transmission
    - ran the hour-ahead balancing market

# Electricity Regulation in California

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## Deregulation Implemented in March 1998

- The Power Exchange begins operations
- Few consumers chose new suppliers
  - The CTC greatly reduced financial incentive. New providers could undercut the incumbent only if they sold power below the wholesale price
  - The 4-year rate freeze removed the incentive for competitive providers to guarantee fixed rates
- Wholesale prices were generally in line with prior predictions through 1999

# Electricity Regulation in California

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## The System Collapsed in 2000

- Day ahead electricity prices rose from \$25-\$35/MWh in 1999 to \$200-\$300/MWh in 2000
  - The highest day-ahead price was \$956/MWh
- Tight supplies resulted in eight major rolling “brown-outs” affecting significant portions of California

# Electricity Regulation in California

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## Why did the System Collapse?

- The “Perfect” Storm
- Supply and Demand
  - California had added very capacity since 1991
  - Unusually hot summer temperatures increased electric demand to power air conditioning
  - Supply was further constrained by reduced imports of Pacific Northwest hydroelectricity
    - 1999-2000 and 2000-2001 were very dry
- CPUC imposed wholesale price cap of \$250/MWh

# Electricity Regulation in California

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## Why did the System Collapse?

- Market Design
  - The incumbent utilities were directed to divest their fossil-fueled generators
  - State regulators strongly discouraged incumbent utilities from entering into long-term supply contracts
  - The greatest weakness in the design of the market was probably the absence of any mechanism for demand to respond to the wholesale price
- ENRON
  - Fraud

# Electricity Regulation in California

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## Why Did the System Collapse

- Market Power
  - Market rules allowed generators to withhold power from the day-ahead market and sell into the hour-ahead market when the power was needed to keep the entire system stable.
  - The shift to the real-time market also destabilized the system due to the need for last minute system coordination
  - Market power is estimated to have doubled the cost of electricity during the crisis

# Electricity Regulation in California

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## The Crisis Ends

- FERC orders dated April 26, and June 19, 2001
  - Generators required to offer all available capacity and the market price was set at the highest accepted bid
  - Each generator's price capped based on heat rates and fuel costs
  - Included measures to prevent price-inflating strategies
- Gas prices fell from around \$12/MMBtu to around \$5/MMBtu substantially dropping the operating costs for gas-fired generators
- Today, California appears to be moving towards reestablishing a vertically integrated system

# Electricity Regulation in California

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## Lessons Learned

- Electricity is unique
  - Inability to store and the requirement for continuous system balance gives the marginal producer significant market power when supplies are constrained
- Lack of retail Price Signal was fatal
- Market design matters
  - Prohibition/discouragement of long-term contracts significantly increased utility costs
  - Ability of generators to skip the day-ahead market and sell into the real-time market huge problem

# Electricity Regulation in California

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## Lessons Learned

- Business WILL find and exploit opportunities to make money
- Good regulators must be vigilant in the design, implementation and monitoring of markets

# Thank You.



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I am available for any questions.