



Regulated v. Deregulated Power Markets Implications for CO₂ Policy

CCAP Air Quality Dialog

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Presentation Overview

- Regulated v. Competitive Power Markets
- Wholesale deregulation
 - Recent capacity additions
- Retail restructuring
 - Marginal v. average rates
 - Fixed rate of return v. market earnings
 - Treatment of allowances
- Implications for CO2 regulations

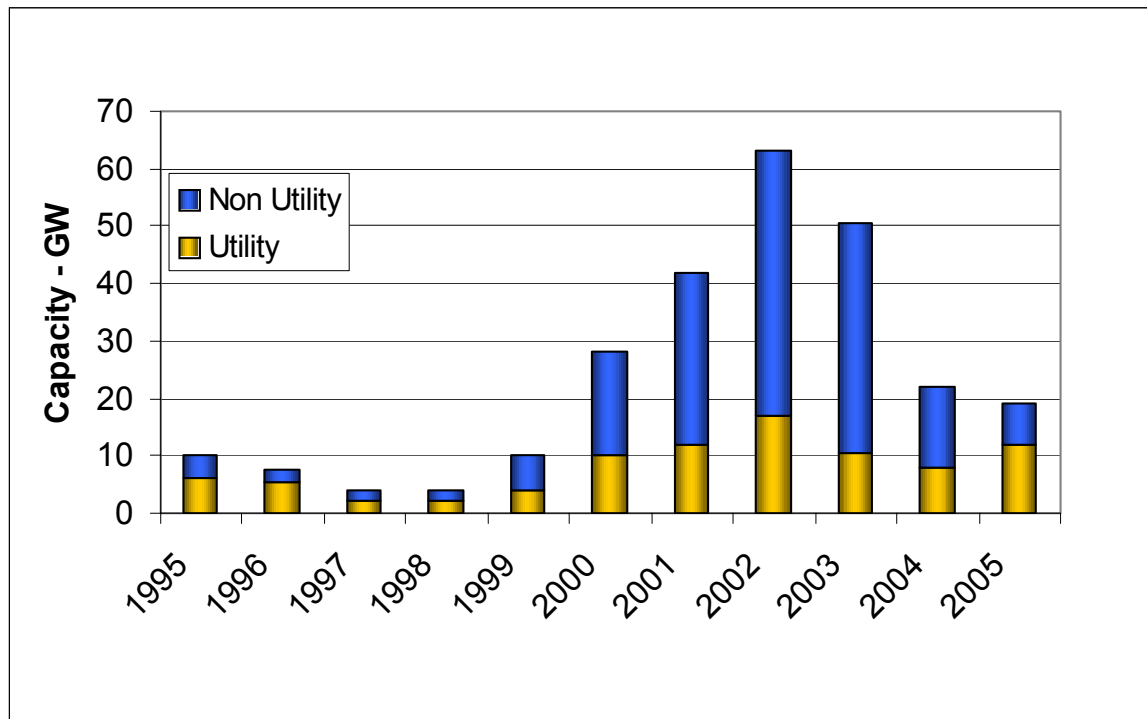
Impetus to Promote Competitive Power Markets

- Federal and state policy makers generally introduced competition in the electric power industry to overcome the perceived shortcomings of traditional cost-based regulation.
- In competitive markets, prices are expected to guide consumption and investment decisions to bring about an efficient allocation of resources.
- Need to distinguish between wholesale and retail markets

Wholesale Competition

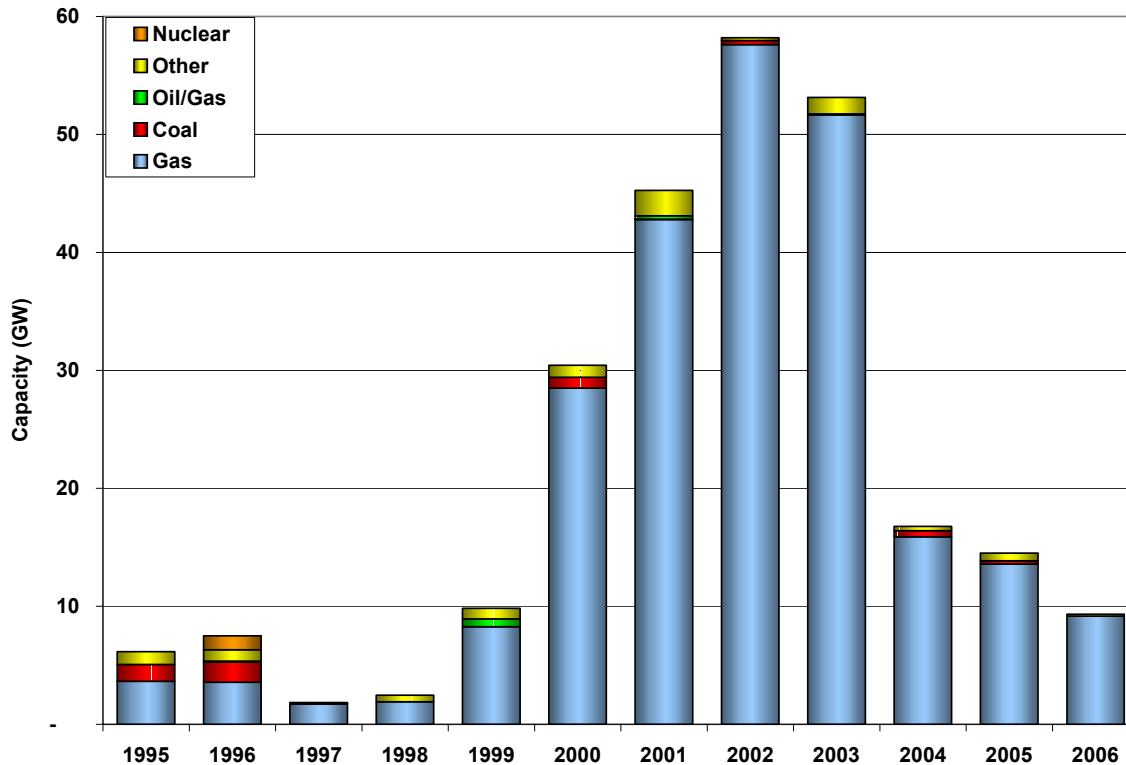
- For almost 30 years, Congress has taken steps to encourage competition in Wholesale electric markets
 - Public Utility Regulatory Policies Act (PURPA), 1978
 - Energy Policy Act (EPACT), 1995
 - Energy Policy Act (EPACT), 2005
- FERC Orders 888, 889 and 2000 have provided specifics
- All sought to promote competition by lowering entry barriers, increasing transmission access or both.
 - IPPs entered wholesale markets in force
- Regional wholesale markets have developed differently
 - Open Access transmission regimes
 - ISO/RTO structures

Non-Utilities Dominate Capacity Additions since yr-2000



- IPPs were responsible for the majority of new capacity coming on-line
 - Of the approximately 260 GW of capacity built since 1995, 65% has been built by non-utilities
 - 70% since 2000
- Many built on a merchant basis, but this is changing going forward

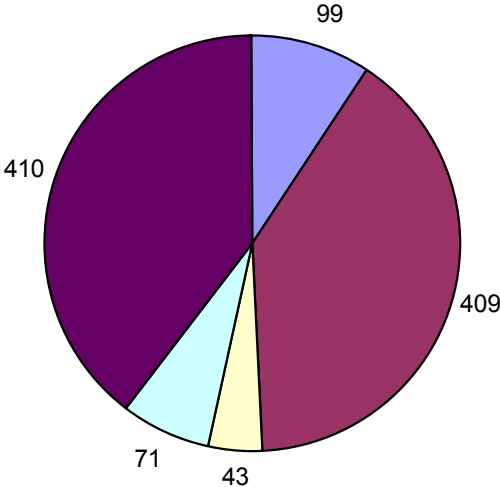
Gas dominated the Build Mix



- Virtually all capacity additions over that timeframe have been gas-fired plants
- Low capital costs
- Easier to site
- At the time – low operating costs including emissions and fuel

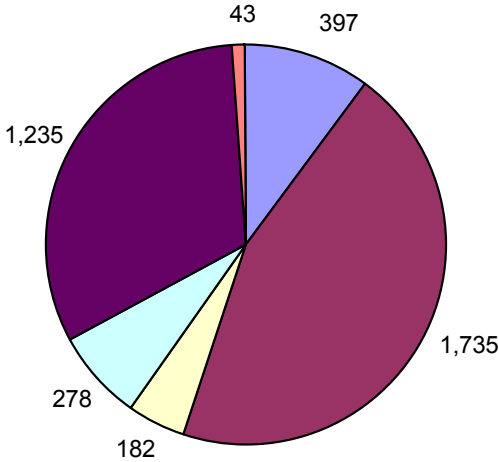
2004 US Installed Capacity & Generation

Nameplate Capacity (GW)



■ Munis
 ■ IOUs
 ■ Coops
 ■ FPA
 ■ Non-Utilities

Generation GWh



■ Munis
 ■ IOUs
 ■ Coops
 ■ FPA
 ■ Non-Utilities
 ■ Pwr Mktrs

Retail Restructuring and Wholesale Markets

- The level of retail restructuring has implications for how power plants are built to serve retail load, and - more specifically how generators are structured and compensated.
- **Regulated market**
 - IOUs traditionally operated as vertically integrated companies
 - responsibilities for, and monopolies over, generation, transmission and distribution
 - Compensated under Cost-of-service regulation
- **Competitive market**
 - In restructured states, generators (mostly IPPs or unregulated subsidiaries of IOUs) have traditionally faced market prices, but this is changing as “pure merchant” plays have been deemed too risky.
 - Long-term PPAs becoming accepted as necessary from developer and purchaser’s perspectives.

Cost of Service Rates v. Marginal Prices

■ Regulated market

- Cost of Service rates = Average cost pricing
 - Total cost (\$) of supplying power, transmission and distribution (service) divided by the MWh load = \$/kWh rate
 - Very attractive as long as market is long on capacity
- Largest costs of building and operating generating capacity are rate-based as long as deemed prudent by the State Commission
 - Associated Risks borne by ratepayers as long as prudent, as are variable costs (environmental & fuel)

■ Competitive market

- Marginal Pricing with reliance on market price to signal need for new capacity
 - Questions as to whether capacity markets in competitive wholesale markets send enough of a sustained market signal
 - NY, PJM, ISO NE have established capacity markets, proposal for 3-5 yr forwards (NY, NE)
- Risks associated with capital expenditures on capacity additions are borne by shareholders, as are variable costs

Rate of Return v. Market Earnings

■ Regulated market

- Integrated utilities in traditionally regulated states – and under cost of service regulation – have their rates of return specified by the State Regulatory Commission
- The return is typically earned on capital base, and therefore, many utilities have the incentive to build up their capital stock.
 - Averch-Johnson Effect – tendency to over-invest in capital intensive projects to maximize returns
- Little incentive to maximize performance as fixed rate of return limits utility's ability to take risks and earn the rewards
 - PBR and variants sought to address inherent disincentives

■ Competitive market

- Non-utilities, subject to market forces, work under an opposing paradigm – they are looking to maximize their rate of return while minimizing up-front capital costs.
- Financing no longer available for developers relying on competitive market play.

Treatment of Allowances

■ Regulated Market

- Allowance costs may not be accounted for in retail rates if they are allocated at no cost (either grandfathered or updating) – zero cost point.
- Moving to an auction system would result in a change to how allowance costs are treated – and passed on to customers (similar to fuel charge).
- Limited incentive to maximize value of allowance book and take full advantage of allowance trading opportunities

■ Competitive Market

- Auction and grandfathered allocation system have same effect, so long as all allowances make it into the market.
- Allowance costs are added to the marginal cost of generation and increase total energy costs – that are passed on to customers.
- Updating can have “perverse incentive” effect in that generation today earns future allowances (income).

Implications for CO₂ Regulations

- Large capital projects, such as new coal IGCC or new nuclear will not be built without firm long-term off-take agreements with credit worthy counter parties.
 - Those with regulatory approval will obtain the best financing rates
 - Traditional coal states have added incentives to promote the use of local coals
 - May see parties willing to accommodate shorter PPAs with prospects of selling remainder at market prices – if they stand a lot to gain and can hedge downside risks
- Owners of low-emissions, low fuel volatility generators in deregulated states should enjoy large profits from CO₂ regulations – but only if selling at marginal prices.
 - New plants with long-term PPAs won't see that advantage.

Implications for CO₂ Regulations

- Carbon Capture Sequestration (CCS) not economic without \$20-25/ton CO₂ price.
 - Can be sold as a hedge against CO₂ in both regulated and competitive states, but chances much greater in regulated states.
- Regulated states will push for cap and trade program with free allocation of allowances due to impact on rates.
 - Competitive states don't distinguish, from a ratepayer perspective, between a carbon cap and an upstream carbon tax.

For More Information

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