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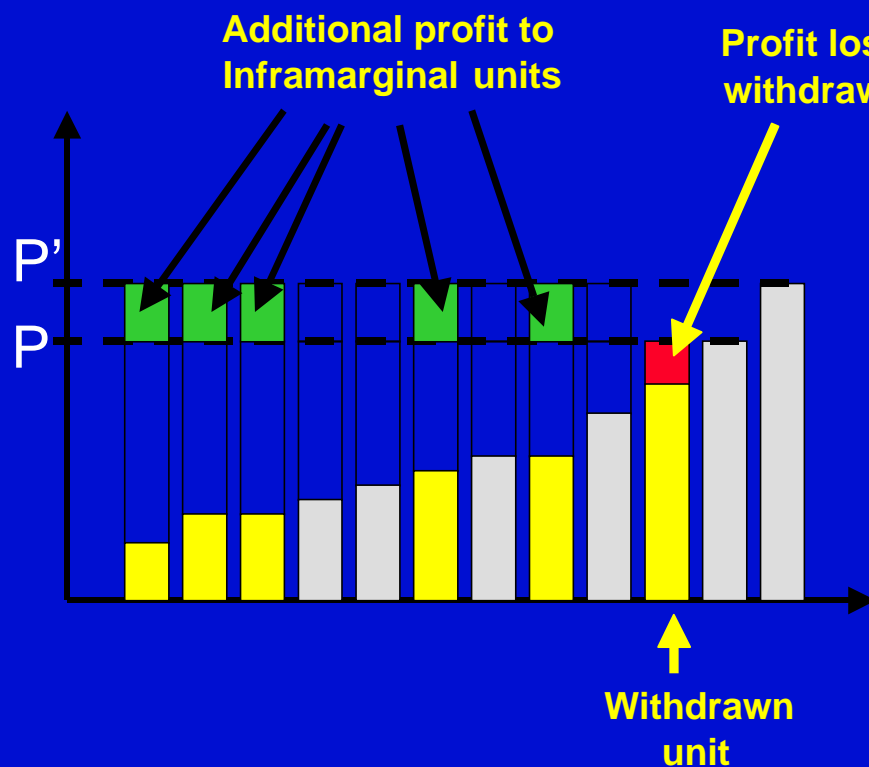
Determination of Horizontal Market Power Abuse in Wholesale Electricity Markets

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When does the potential for generator market power arise?



- ◆ Generators able to withhold capacity (or price up) profitably – trade lower Q for higher P
- ◆ Most likely when demand is inelastic, or near jumps or steep sections of supply curve
- ◆ Often analyzed as potential for non-competitive Nash equilibrium in Cournot games
- ◆ Only loosely correlated with concentration measures, such as HHI

Tacit collusion – generator strategies as repeated games

Single-shot game

		Firm B	
		Compete	Withhold
Firm A	Compete	2 2	4 1
	Withhold	1 4	3 3

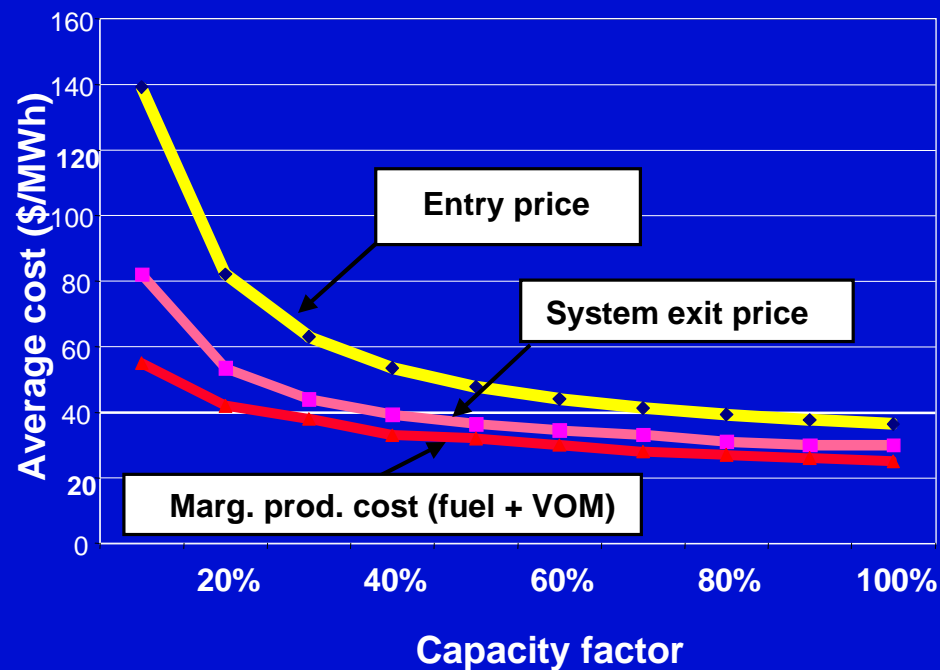
Compete is dominant strategy for A and B

Repeated game

		Firm B	
		Compete	Withhold
Firm A	Compete	2 2	4 1
	Withhold	1 4	3 3

- ◆ Repeated games allow for many more non-competitive Nash equilibria
- ◆ Potential for tacit collusion dependent on detection and punishment of cheating
- ◆ Can calculate implied discount rate for cheating to be profitable if certain to be detected – in this example 100% per period
- ◆ More practical limits are limited knowledge of competitors' contract positions

Dynamic prices may provide reasonable insight into market performance



- ◆ Average not marginal costs determine system entry and exit
- ◆ Define a system exit price as the average revenue required to cover the going-forward fixed and variable costs of sufficient capacity to meet demand reliably
- ◆ If average prices are at the system exit price then they cannot remain *sustainably* lower
- ◆ Entry prices should reflect a long-term cap on *average* prices - unless barriers to entry are present

The regulatory dilemma

- ◆ Approval of market-based rates contingent on adequate mitigation of market power
- ◆ The HHI standards used to date to prospectively identify market power are unlikely to lead to purely competitive outcomes - likely to be insufficient when demand is highly inelastic
- ◆ The Federal Power Act requires “just and reasonable rates” - does this equal SRMC-based? What does it mean?
- ◆ As of yet, FPA standard of just and reasonable outcomes has not been clarified by FERC or the federal courts
- ◆ U.S. does not have the legal flexibility for “ministerial discretion” that is enshrined in many countries’ enabling legislation

What are two potential criteria for a legal determination of market power abuse?

Anti-trust approach

- ◆ Prohibits agreements – explicit or tacit – on restraints of trade
- ◆ Does not seek to regulate pricing decisions by firms
 - ◆ Ford is not prevented from selling cars at higher than the direct costs of assembly
 - ◆ Airlines are not required to fly passengers for the price of jet fuel and a Coke

Calculated variation from SRMC

- ◆ Seek to determine variation from calculated SRMC
- ◆ Scarcity values are not directly observable and are correlated with high demand (as is likely exercising of market power)
- ◆ Effectively implies a return to quasi-price regulation
 - ◆ Energy pricing at production costs
 - ◆ Capital values effectively determined by regulatory calculation of scarcity

Constraints in implementing the two potential standards

Anti-trust approach

- ◆ Current low levels of price elasticity imply substantial potential for price spikes in some periods
- ◆ Some form of transition required to new standard – legally and practically - how long?
- ◆ Need to review standards for approval of market-based rates and mergers – current HHI standards may not be appropriate

Calculated variation from SRMC

- ◆ Inconsistent with practice in other industries – can we really do better in electricity?
- ◆ What is a legal and practically acceptable variation? – is there truly “a number” to use?
- ◆ High level of regulatory risk for investors
 - ◆ Could stifle investment in peaking generation?
 - ◆ Could raise long-term costs of capital?

Where do we go from here?

- ◆ **Current dilemma reflects the incompleteness of market development – weak demand response to prices and almost non-existent retail competition**
- ◆ **This state of affairs is not accidental – driven by transitional arrangements chosen by the U.S. states (CTC mechanisms, standard offer structures)**
- ◆ **Should not consider development of wholesale competition in isolation from development of broader retail market**
- ◆ **Need to avoid the worst of all worlds – quasi-markets with high levels of regulatory intervention and subsequent effects on investment and cost of capital**