The Pressures Building On G&T Wholesale Energy Prices

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Central Electric Cooperative

Central Electric Cooperative

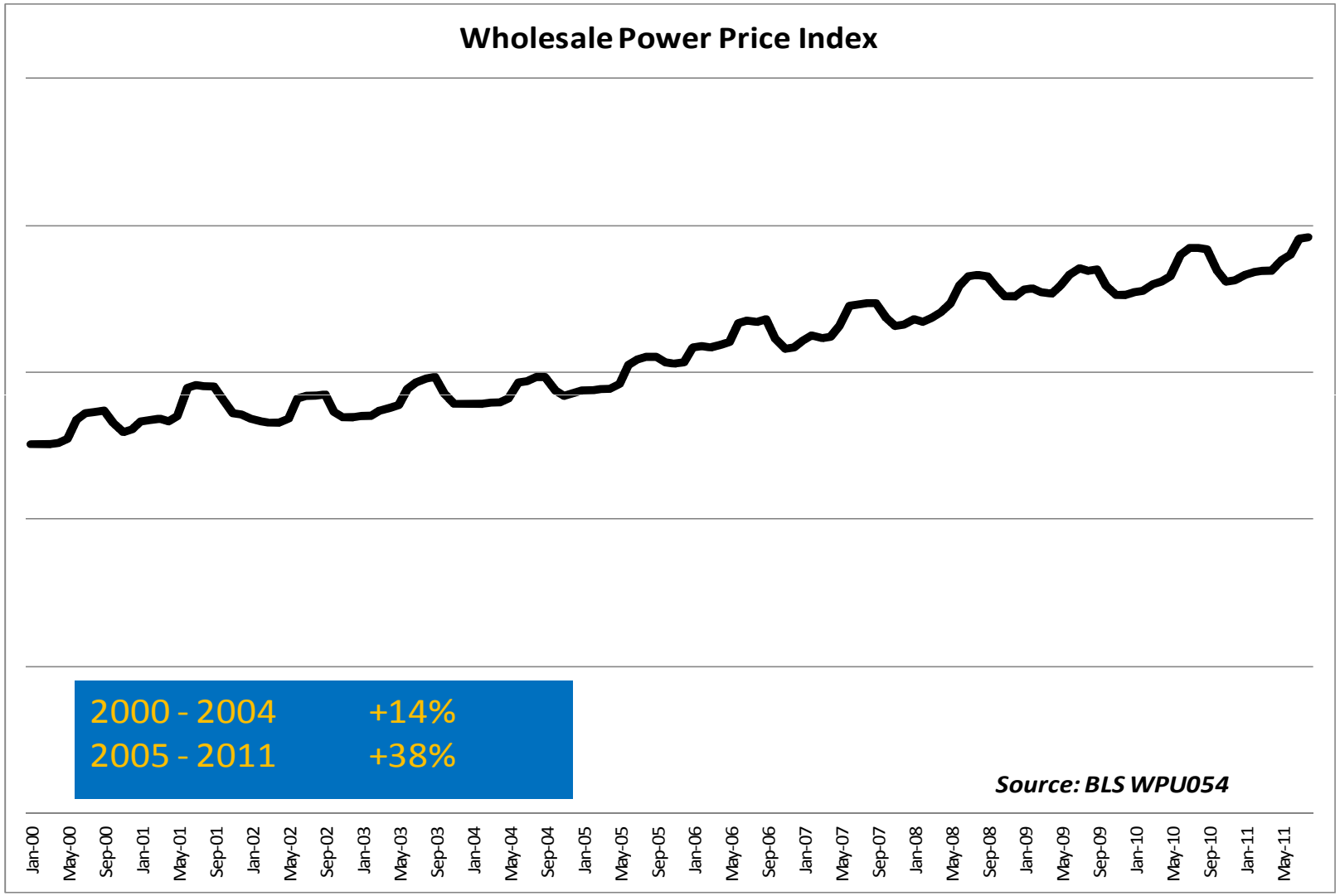
- **G&T Cooperative located in Columbia SC**
  - 4,000 MW peak demand (winter)
  - 16,500,000 MWh sales
  - RUS borrower
- **20 member cooperatives**
  - 700,000 retail meters
  - Load growth along the coast and around cities
- **Central purchases power for resale – it doesn't own generation**
  - Santee Cooper, a state-owned power company
    - Mostly coal generation
    - Around 1,000 MW of nuclear generation coming later this decade
  - Duke Power, beginning 2013
  - Over 100,000 water heater load control switches
- **South Carolina electric cooperative program is vocal and aggressive**

Price Pressure is Not A New Phenomenon

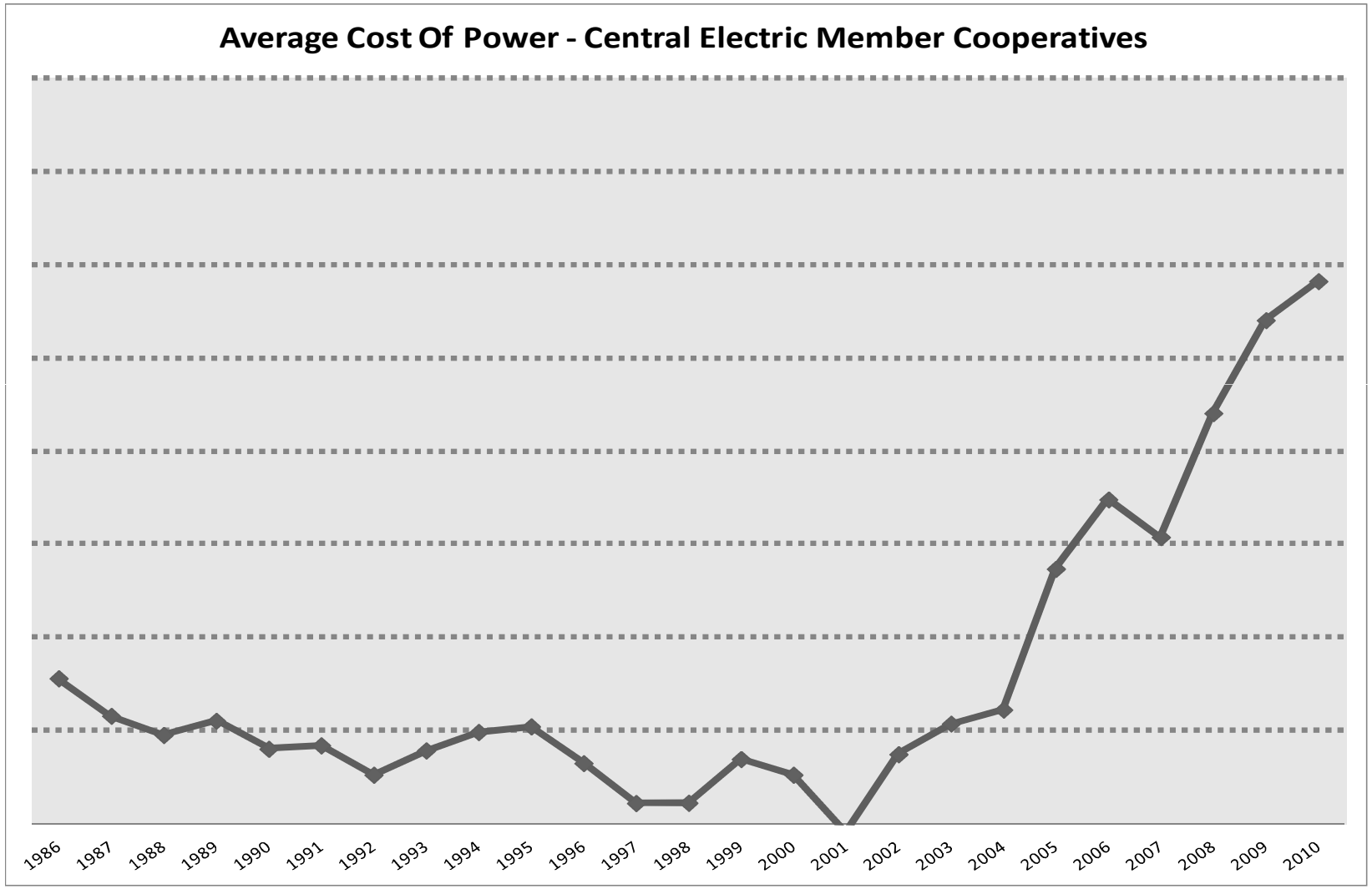
"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way - in short, the period was… like the present…"
Charles Dickens in 1859, describing Paris during the French Revolution

"Nobody likes change except a wet baby"
Mark Twain

The U.S. Price Of Power Has Risen Steadily Over The Past 5 Years, Much Of It During A Poor Economy



Central Electric Is Seeing Cost Increases



What Cost / Price Pressures Are There?

1. Environmental
2. Fuel
3. Fundamental
4. Business Model

Environmental Cost Pressures

Coops Are More Dependent On Coal Than IOUs & Municipal Utilities

- **Coops were growing during the seventies – the 1973 oil crisis and the 1978 Fuel Use Act resulted in no new gas generation**
- **As a consequence, coops during the seventies and eighties moved into coal (and also nuclear)**
- **Coal generation ownership by type of power company**
  - IOUs 47%
  - Munis 60%
  - Federal 60%
  - Coops 77%

Source: NRECA

EPA Regulations Affecting Coal Generation – Stop, Go, I Don't Know

- **Carbon cap & trade –**
- **Clean Air Transport Rule (CATR)**
  - SO2 And NOX Regs
  - Replaces CAIR
  - Scheduled to take effect January 2012
- **Utility Maximum Available Control Technology (MACT)**
  - Final rule late 2011?
  - Relates to metallic HAPS, including mercury
- **Cooling Water Intake**
  - Final rule mid 2012
  - Once through cooling
  - Cooling towers

G&T Coops Will Have To Retrofit Existing But Noncompliant Generators If They Want To Continue Operating

- **Scrubbers**
  - $300 / kW
- **Precipitators**
  - $150 / kW
- **Cooling Towers**

Source: EIA April 2010

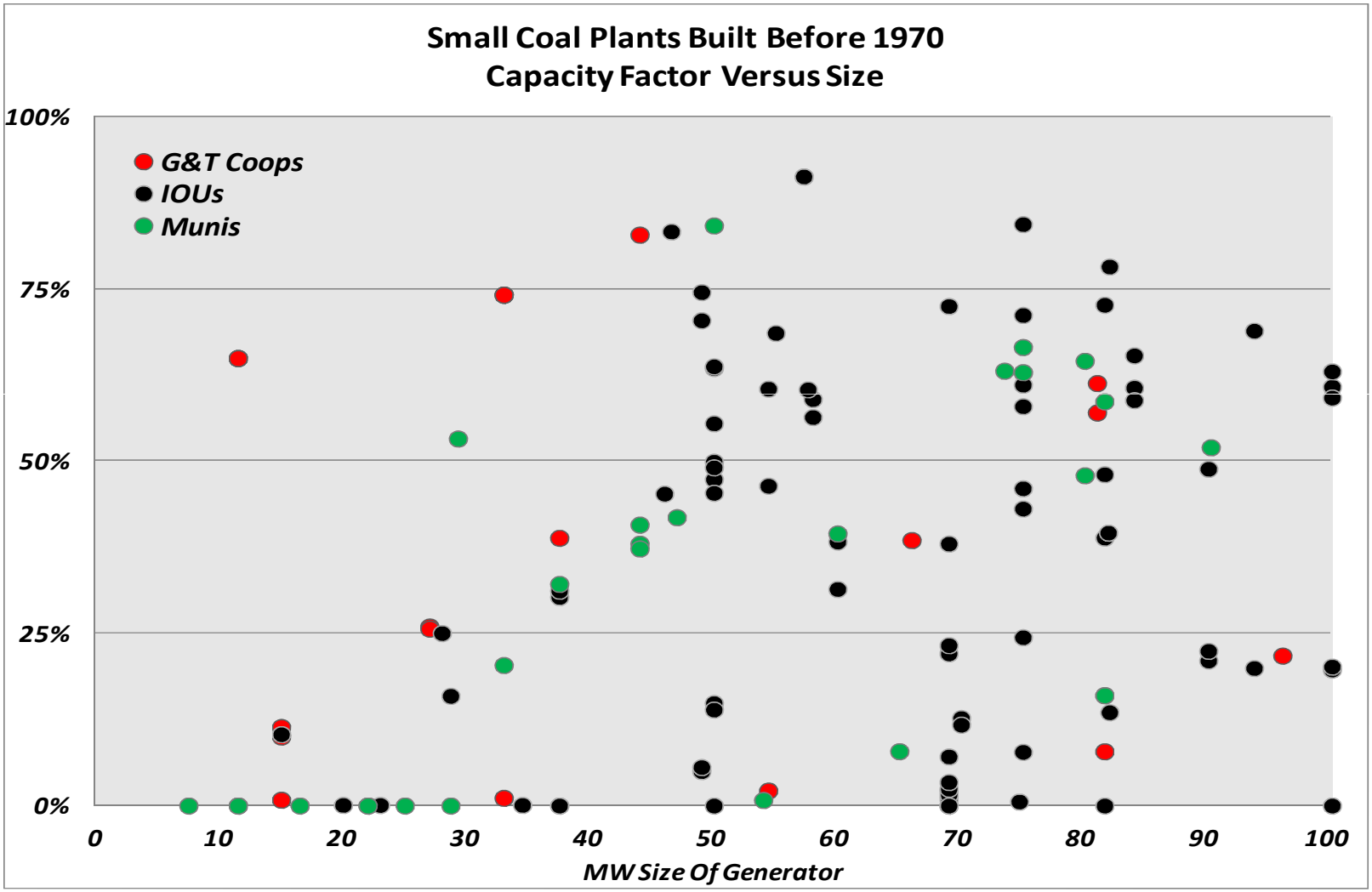
Cost Pressure From Coal Generators Shutting Down

- **One argument being made is that small coal generators, say under 100 MW, won't be able to justify environmental retrofits, and will therefore shut down**
- **Another argument being made is that older coal generators may not have the life left in them to justify environmental retrofits, and will therefore shut down**
- **Cost pressure comes from replacing old generation (that has been depreciated out) with new generation**
  - This logic is sound
  - However, it is important to look at the operating characteristics of the older generation
  - If the G&T is contemplating shutting down a coal generating plant that only runs 500 hours a year, that may be a different replacement option than if the plant runs 7,000 hours a year

Old Small Coal-Fired Generation

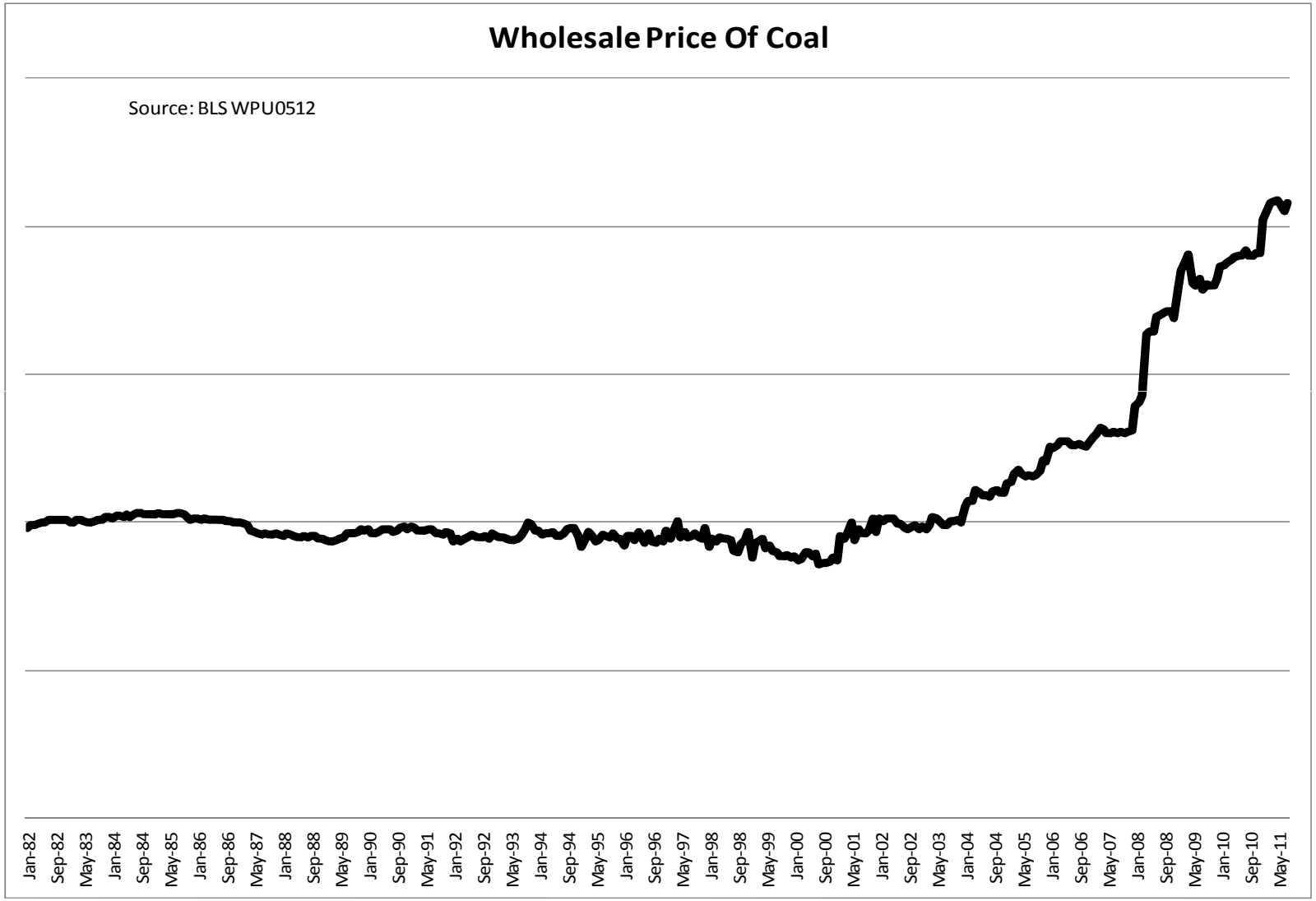
- **In the U.S., there are around 130 coal generating plants, 100 MW or smaller, built before 1970**
- **7,500 MW aggregate**
  - G&Ts own around 800 MW of the total, or 11%
  - Munis are at 18%
- **1/3 of these generators account for 2/3 of the total generation**

1/3 Of These Generators Account For 2/3 Of All Generation

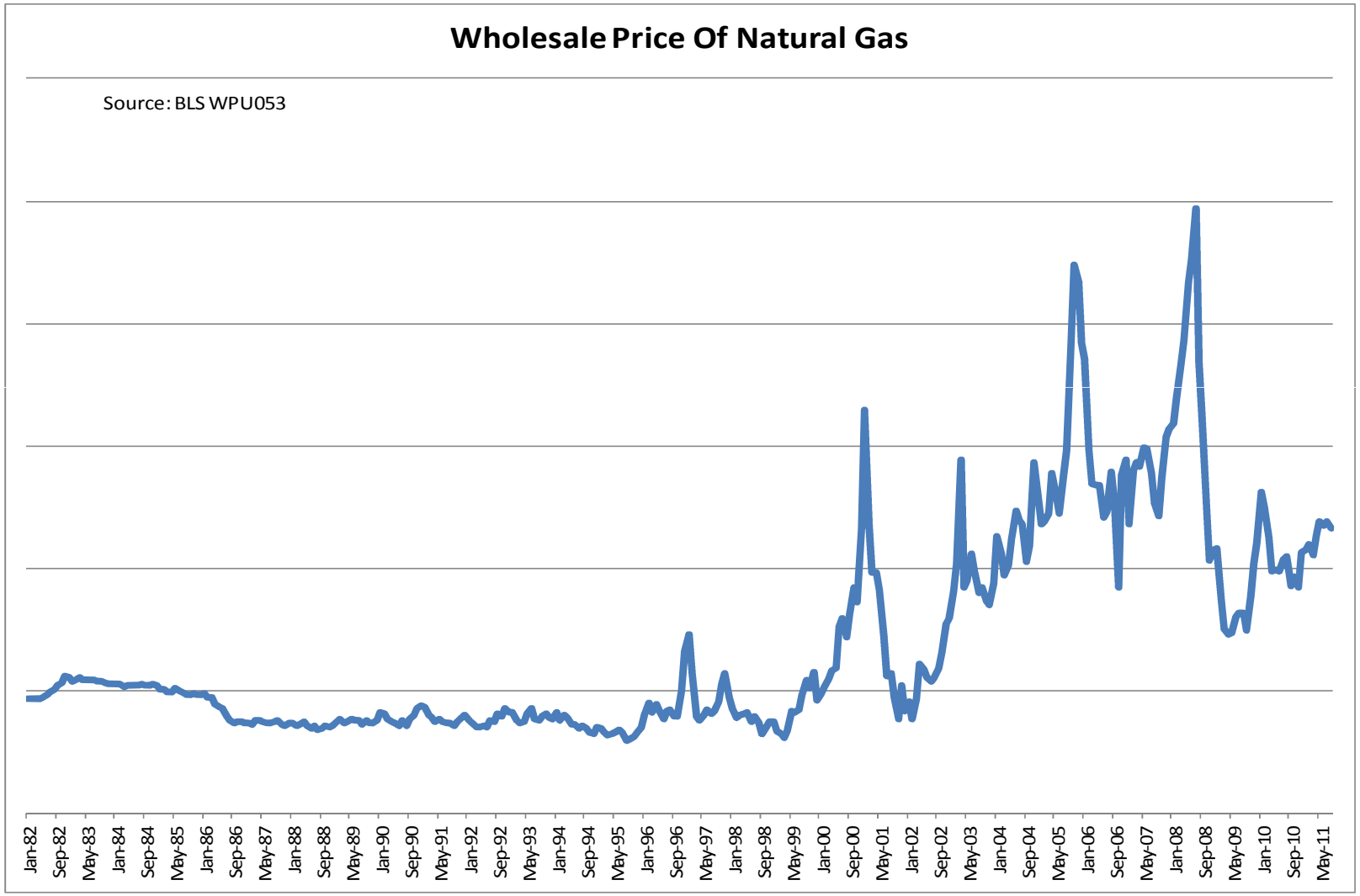


Fuel Cost Pressures

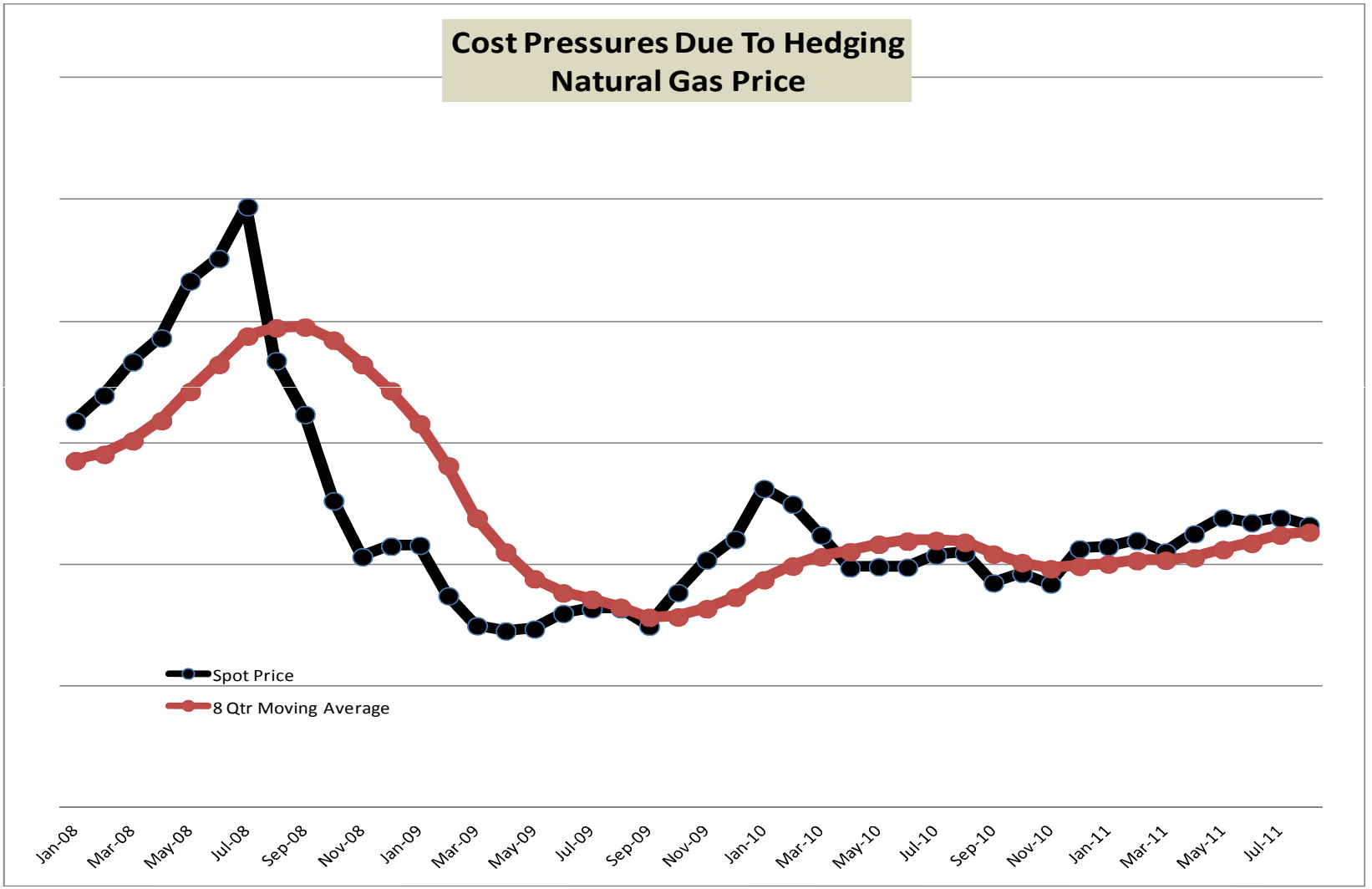
Cost Pressure From Coal Prices



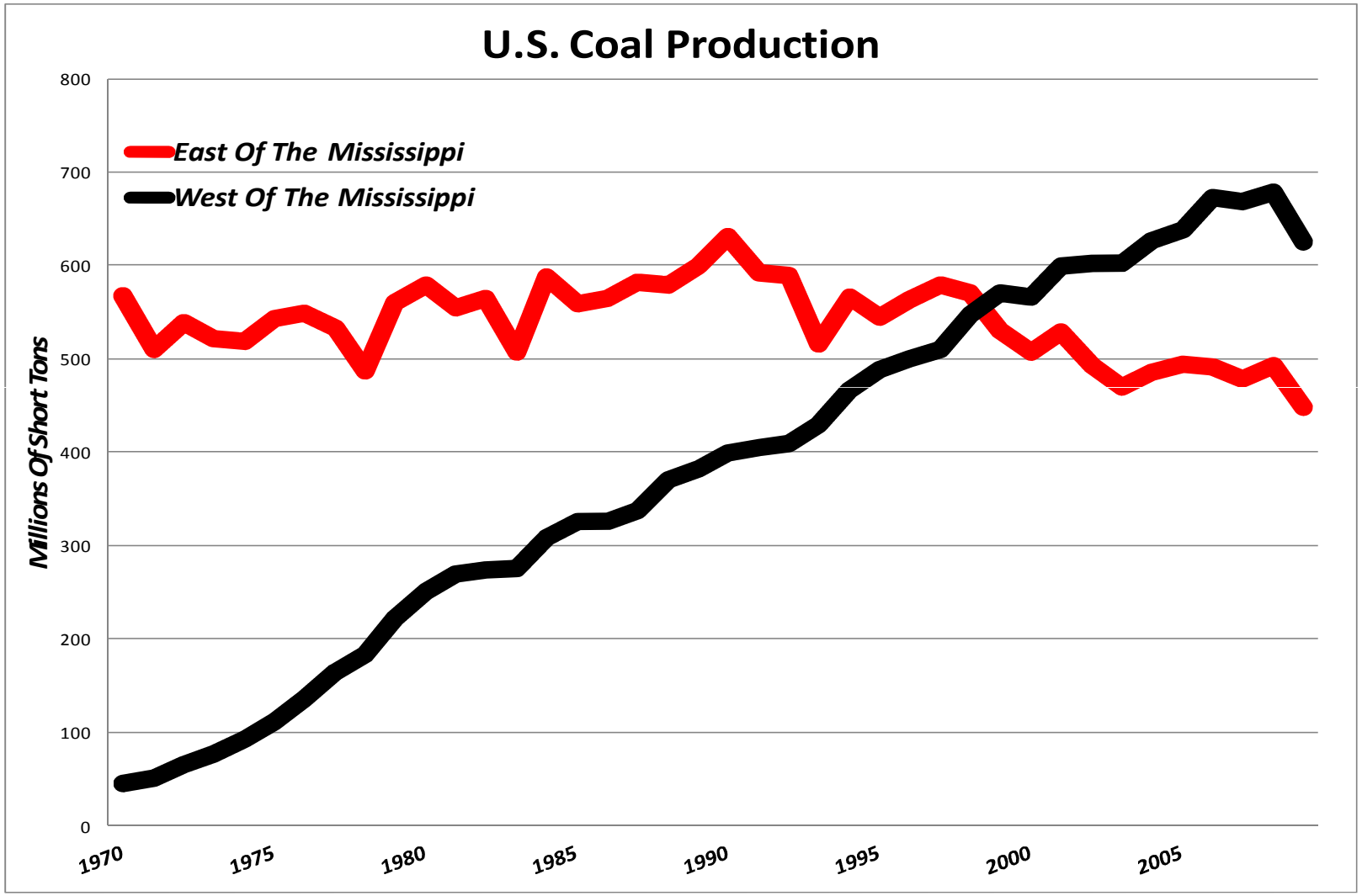
Natural Gas Has Proven To Be Volatile



Hedging Is The Smart Move But Hedging Is Not Immune To Cost Pressure



U.S. Coal Production Is Increasingly Moving From East To West, Bringing Transportation Pressure And Also Product Specification Pressure



Business Model Pressure

IOUs Merge, Coops "Layer"

- **IOUs Merge**

Source: Christensen Associates Presentation To Central Electric Power

  - Fast changing market structure
  - Market entry and competition
  - Contain cost pressures through size
    - Scale economies, operational synergies
  - Institutional power to influence and steer policy toward favorable outcomes
    - Jim Rogers, prime example
    - Repeal of PUHCA
    - EPA Rules
    - RTO Policy

- **Coops Layer**
  - G&T / ACES Power
  - Statewide / NRECA / Touchstone Energy

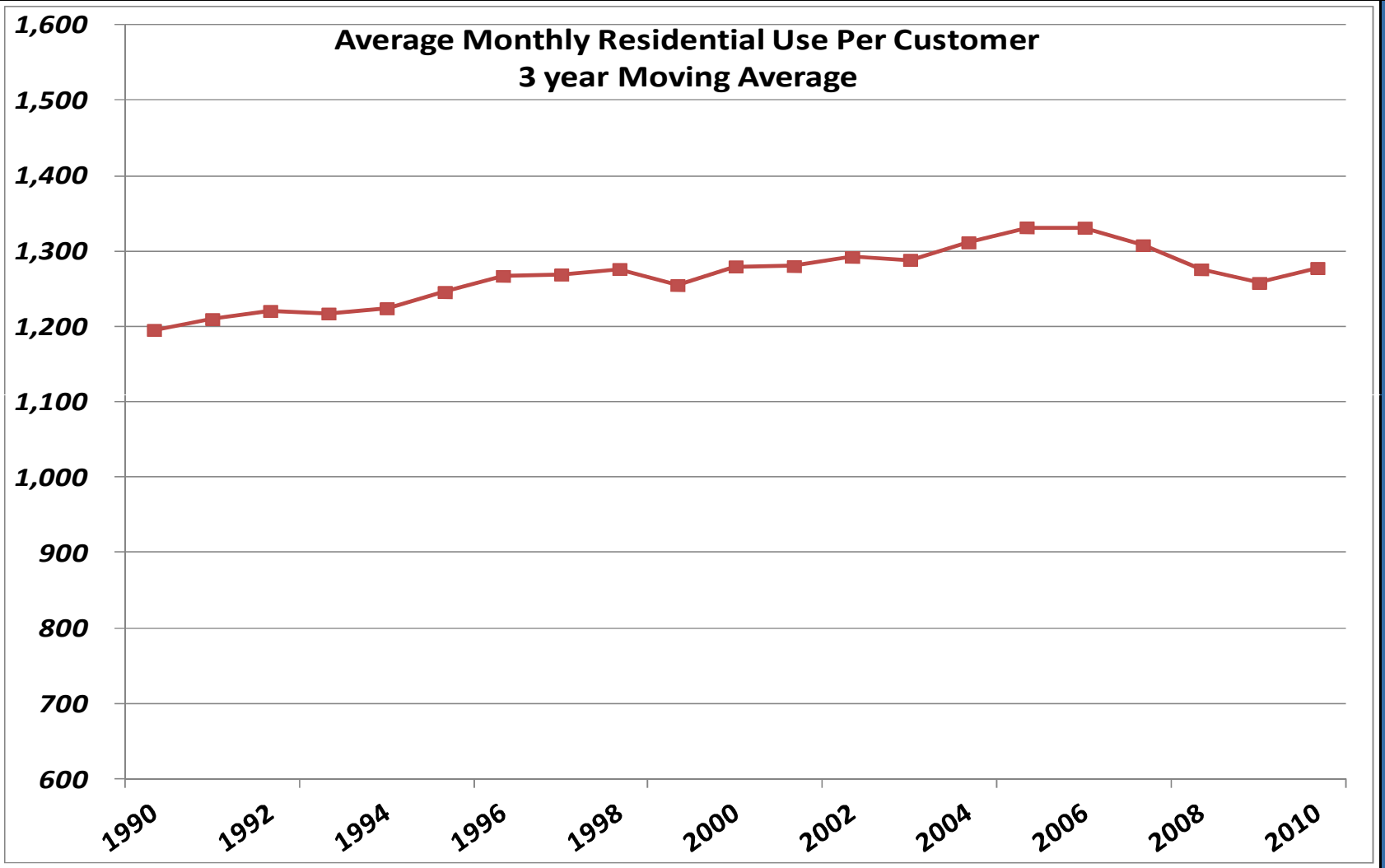
Mergers 2

- **Debt**
  - Debt cost largely driven by:
    - Coverage
    - Expected coverage, given sizable construction
    - Regulatory authorities (consistency of decisions)
- **Equity**
  - There is a premium for size
  - However, once the market capitalization goes above $3-4 billion, the premium diminishes greatly

Source: Christensen Associates Presentation
To Central Electric Power

Fundamental Pressures

Residential Use Per Customer Is Mature



esn't Help That EIA Can't Even Tell What ration Is Going To Cost

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	Overnight Capital Cost ($/kW)		
	AEO 2011	AEO 2010	% Change
Coal			
/o C	$2,844	$2,271	25%
	$3,221	$2,624	23%
	$5,348	$3,857	39%
Natural Gas			
G	$978	$1,005	-3%
	$1,003	$989	1%
C with C	$2,060	$1,973	4%
	$974	$700	39%
	$665	$662	0%
	$6,835	$5,595	22%
Nuclear			
	$5,339	$3,902	37%
Renewables			
	$3,860	$3,931	-2%
	$4,141	$1,786	132%
C	$8,232	$2,655	210%
ydropow	$3,078	$2,340	32%
	$2,438	$2,007	21%
	$5,975	$4,021	49%
	$4,692	$5,242	-10%

py" Capital Investments

Large scale generation facilities -- and transmission also – can be characterized as indivisible resources, often referred to "lumpy investments". The physical facilities, and thus the underlying capital investment, tend to be completed in sizable increments. This means that over years, the installed capacity and investment can rise abruptly for small- and moderate-sized utilities.

- However, the need for additional capacity (growth of energy sales and peak demands) assumes a gradually rising path over time.

For example, a small-sized utility has a demand of 750 MW at the time of a new generator, rising approximately 30 MWs annually (about 2.0%). If capacity was divisible into small increments, the utility would add generation in approximately equivalent increments, about 30 MWs per year. However, because of lumpy capacity additions, the utility brings a new 400MW unit into commercial operation in 2005, increasing total capacity from 900 MWs to 1,300 MWs.

- The utility would not need to add another new unit for some ten years in the future, not until about 2015.

y Capital Investments 2

The implications of indivisible capacity are several.

- First, because financial measures of costs are based on original accounting costs, financial charges will increase by a greater percentage amount than capacity (MWs).
- This is because a) the 900 MWs in place are partially depreciated, and b) reflected in earlier vintage dollars. This means that, as a consequence to the new unit, the increase in prices (%) is greater than the change in capacity (MW).
- Second, the utility faces two strategy options. The utility can carry the capacity that it needs, and sell excess capacity during the interim years between capacity additions, when it has a "long" capacity position - i.e., has more capacity than it needs.
- Alternatively, the utility can carry a "short position" between capacity additions, in which case it will be purchasing capacity in the years prior to the year that the new unit begins operations.
- Capacity positions are not mutually exclusive. The utility can alternate: remain somewhat short for a few years, subsequently followed by a somewhat long position

Large capacity additions (capital indivisibility), for small- and moderate-sized utilities, impose substantial risks of economic losses on themselves and retail consumers, particularly in the current environment of heightened uncertainty.

- However, large-scale additions may be less costly, on an expected value basis, because of substantial scale economies favoring larger size. That is, the average per MWh cost of a 400 MW unit is below that of a 200 MW generator.
- A possible approach to the realization of economies of scale while also mitigating the risk associated with capital indivisibility is through joint ownership involving several utilities.

etering Cost Pressures

When a homeowner decides to get into the generation business, a coop's bundled price is exposed

This applies to G&T coops as well as distribution coops

etering - Lexington Herald Leader
ober 10 Article On Solar Generation In
ucky

AEK sells a complete 1.1 kilowatt system — which includes five 31/2-by-5-foot panels, installation and all of the equipment to use and monitor the system's performance — for $6,999. However, federal and state incentives lower the final cost to $4,400 for homeowners or $3,900 for businesses.

r Continued

$4,400 for 1.1 kW @20% capacity factor, and a rate block of 10 cents generates a 23 year payback

- However, if the capacity factor improves to 30%, payback falls to 15 years
- If the installation price falls to $3,000, payback falls to 15 years

The combination of declining prices for solar, and increasing capacity factors, will drive paybacks down

There are people today installing solar with no hope ever of paying back – imagine what will happen when it actually could make sense

mary

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Your G&T is not going into a future that is different from any other power company's future

CAPP coal prices have not completely come down from their summer 2008 run-up

Natural gas has seen a demand erosion, and prices have softened

- Central Electric member coops are seeing water heater and space heater market shares under attack

EPA regulations related to coal generation will result in increased capital investment and an economic choice to shut down some generating units

The IOU strategy of merger has not traditionally been embraced by G&T coops

It's easier to keep per unit costs down when organic load growth is pumping up the denominator