

# **APEX Power Services Corporation**

**Presentation**

**“Value of LFGTE in the Future Electric  
Energy Marketplace”**

**to**

**LMOP Workshop**

**Charleston, South Carolina**

**April 7<sup>th</sup>, 2016**

# About APEX

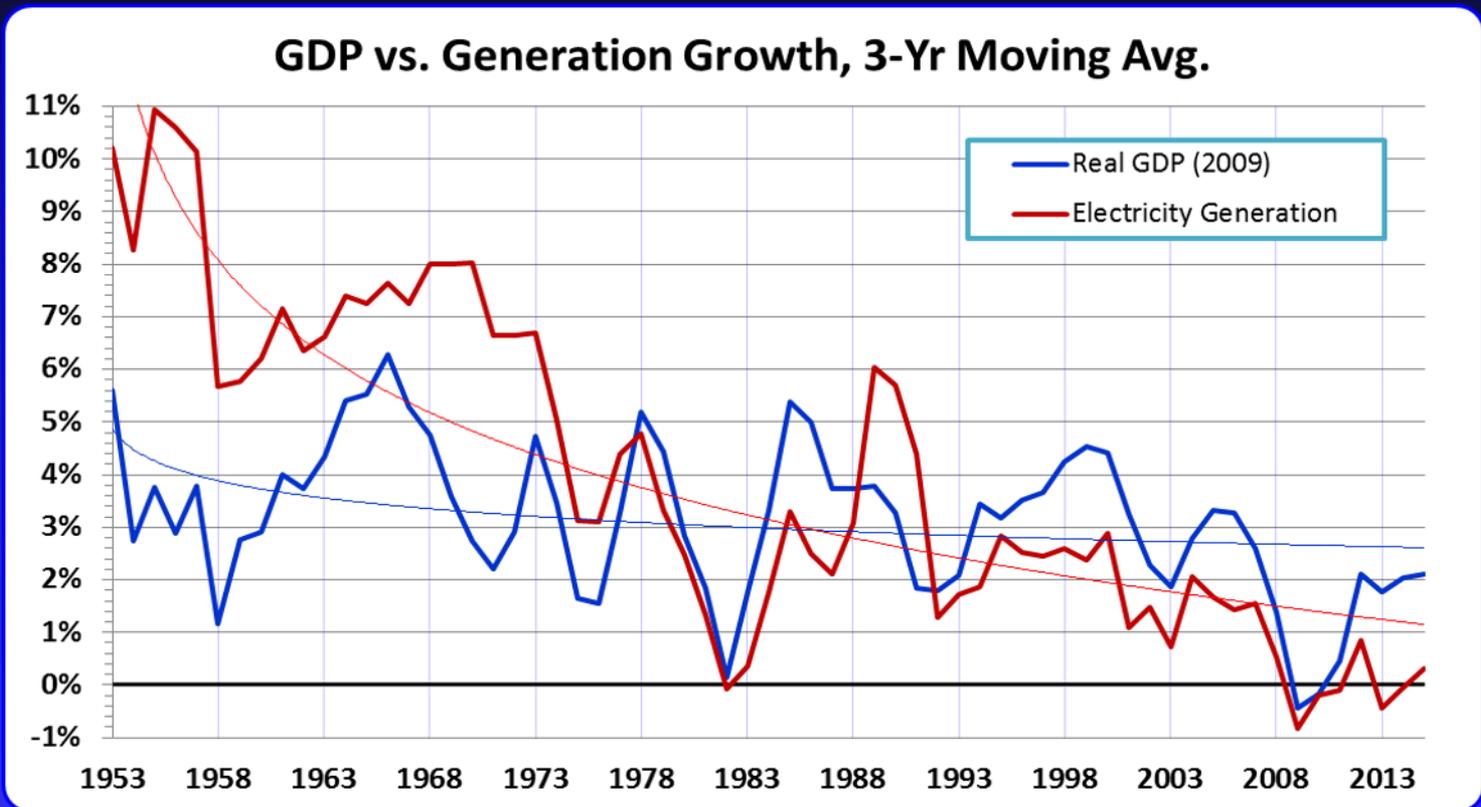
- An independent energy consultant and advisor for over 20 years
- Experienced in all phases of electric/renewable energy
- Experts in leading-edge energy purchase/supply options
- Knowledgeable in energy regulatory policies/procedures
- Represents large energy consumers/producers around the world
- Work closely with financial institutions and funding sources
- Leaders in identifying “economic” enhancement opportunities
- Providers of expert testimony at both the state & federal levels

Provides *“Complete Energy Solutions”*

# Current Electric Industry Market Conditions

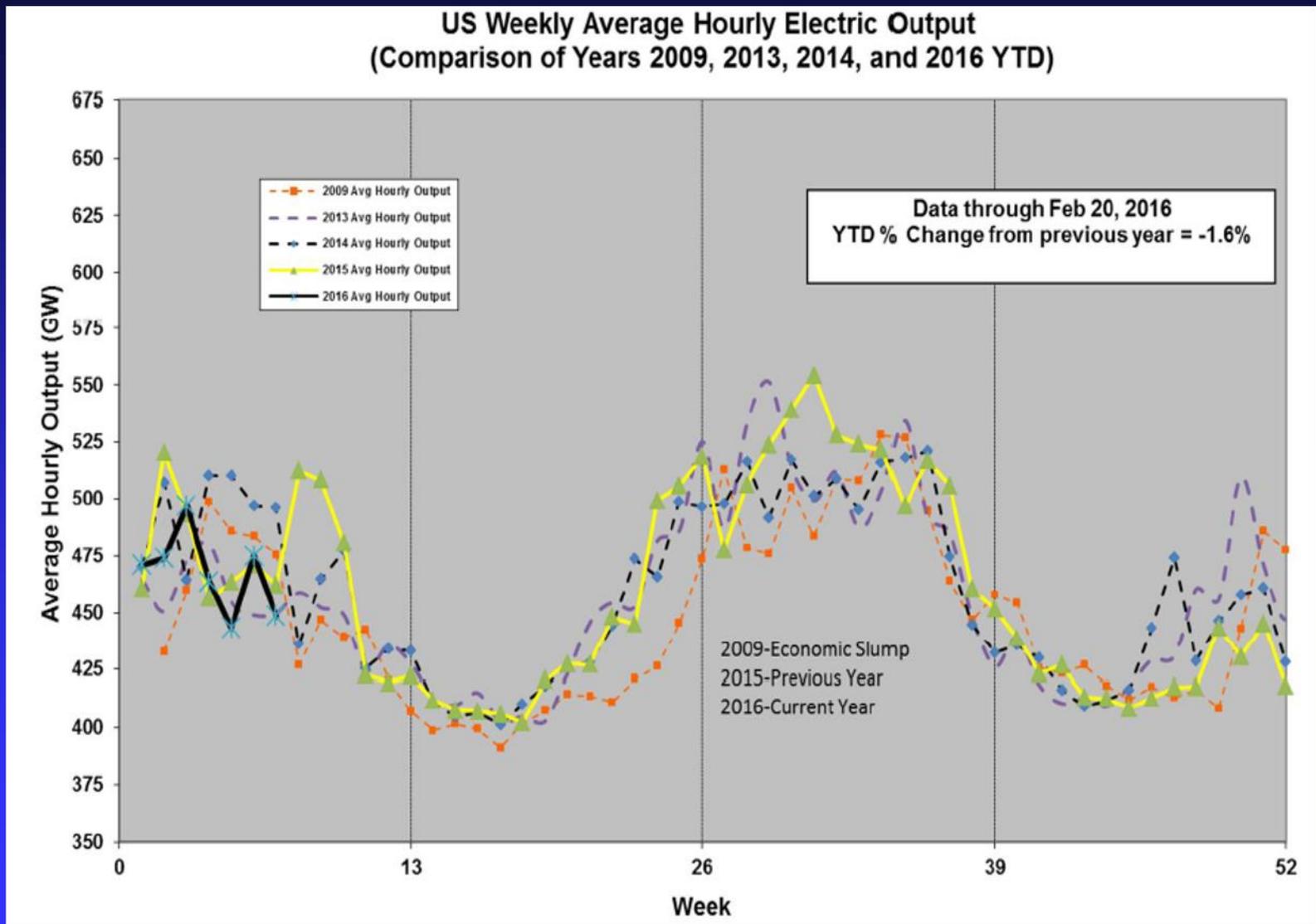
- Extremely low natural gas prices & localized distressed gas (for how long??)
- Implications for new/existing generators and retail customers
- Consumption stagnation and higher reserve margins
- Majority of new generation is renewable and natural gas
- Illiquid electric markets (all short term focused)
- Increasing demand for green/renewable energy/distributed generation
- How will energy/capacity markets & the electric utility industry be impacted?
- Further Consolidation & Downsizing of Utilities (Gas & Electric)
- What changes/opportunities may lie ahead

# GDP vs Electric Generation



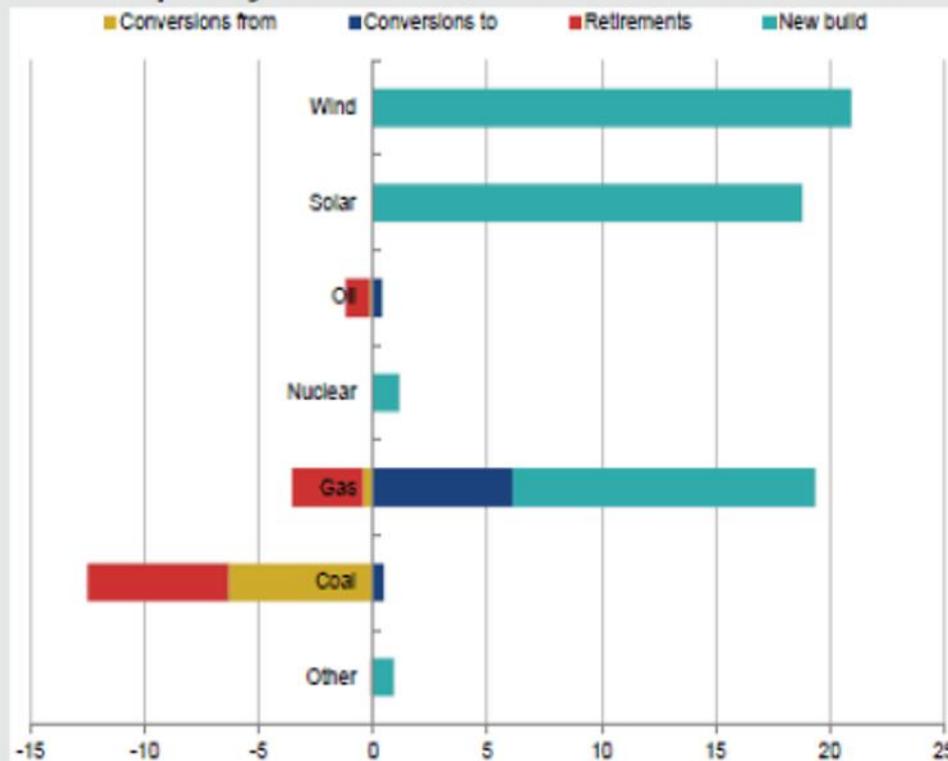
- Generation is no longer growing faster than or with GDP
- Demand reduction from energy efficiency, BTM (solar, cogen, energy storage), and less energy intense industrial activity is projected to continue.

# US Electricity Generation History



# 2016 Generation Supply Changes

2016 capacity additions, retirements and conversions by fuel type (GW)



Fuel type	Operating capacity (MW)			
	Retire-ments	New build	Conver-sions from	Conver-sions to
Wind	-	20,944	-	-
Solar	-	18,796	-	-
Oil	1,066	9	148	377
Nuclear	-	1,150	-	-
Gas	3,098	13,250	455	6,110
Coal	6,169	-	6,339	455
<b>Other</b>				
<i>Biomass</i>	3	242	-	-
<i>Geothermal</i>	-	65	-	-
<i>Hydro</i>	18	268	-	-
<i>Other nonrenewable</i>	85	325	-	-

As of Dec. 28, 2015.

A hyphen indicates a null value.

"Other" includes biomass, geothermal, hydro and other nonrenewable fueled operating capacity.

"Retirements" includes operating capacity for units with a retirement year of 2016.

"New build" includes operating capacity for units with an online year of 2016.

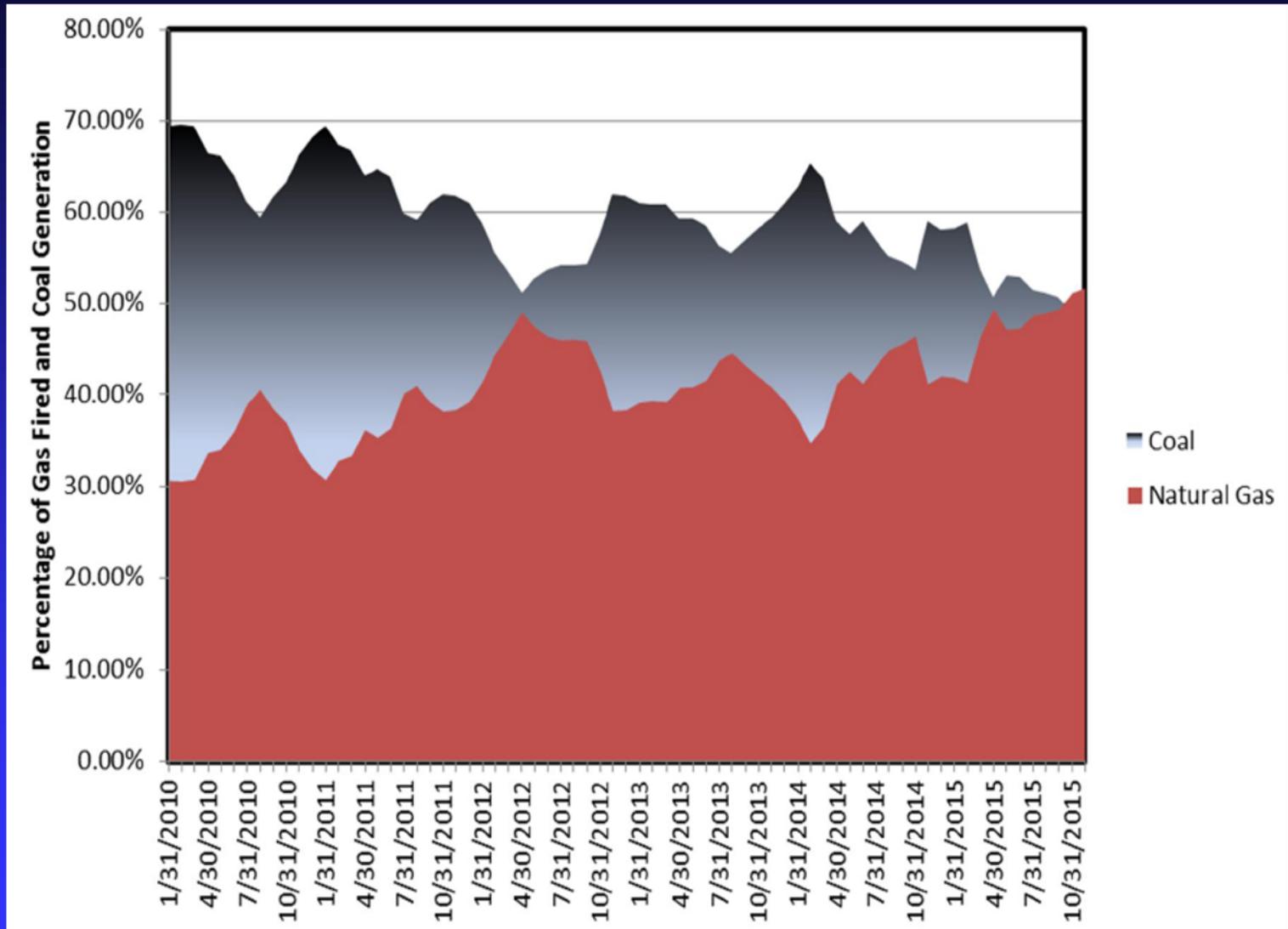
"Conversions from" includes operating capacity for units that are converting from that fuel type.

"Conversions to" includes operating capacity for units that are converting to that fuel type.

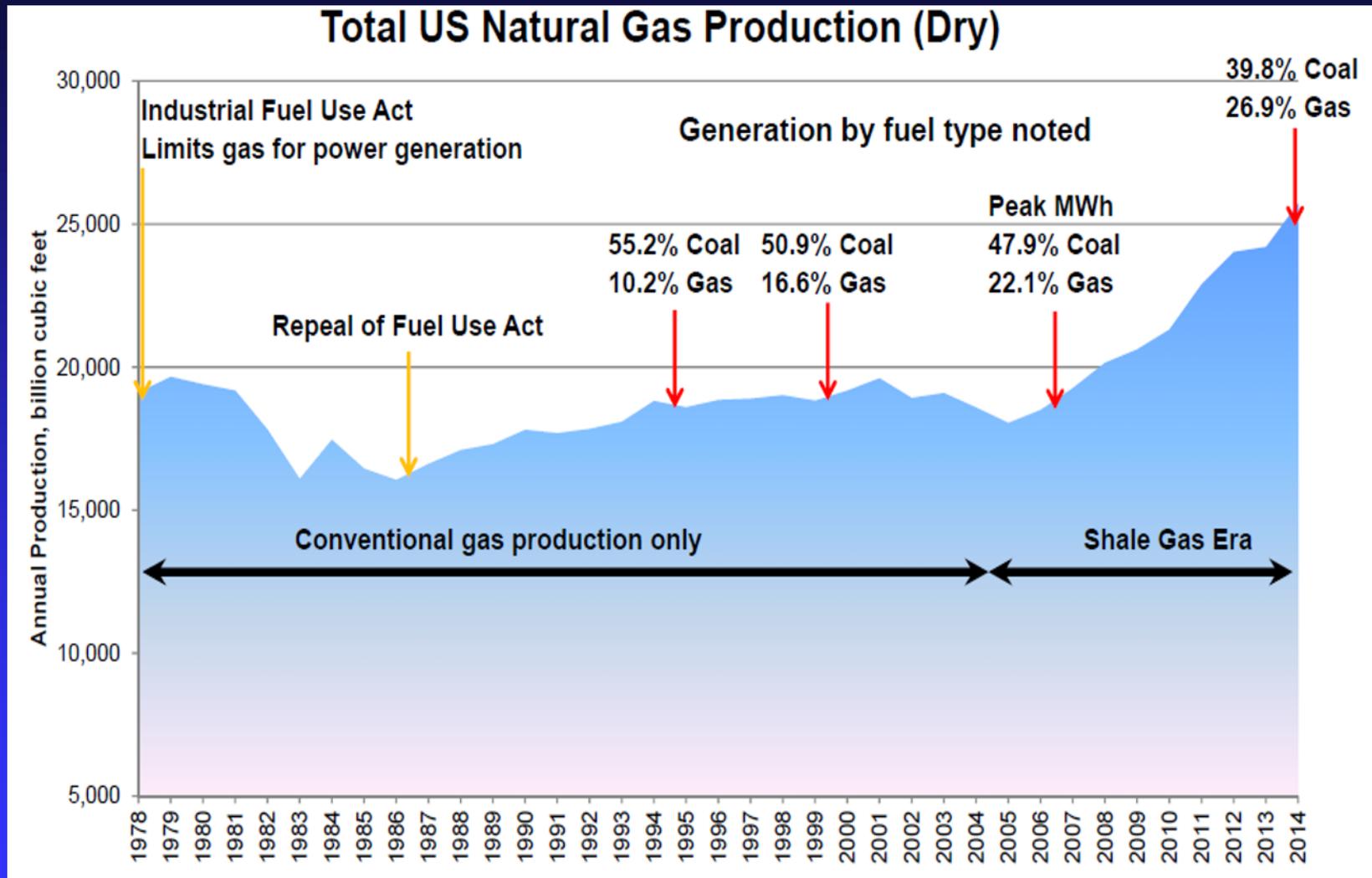
Source: SNL Energy



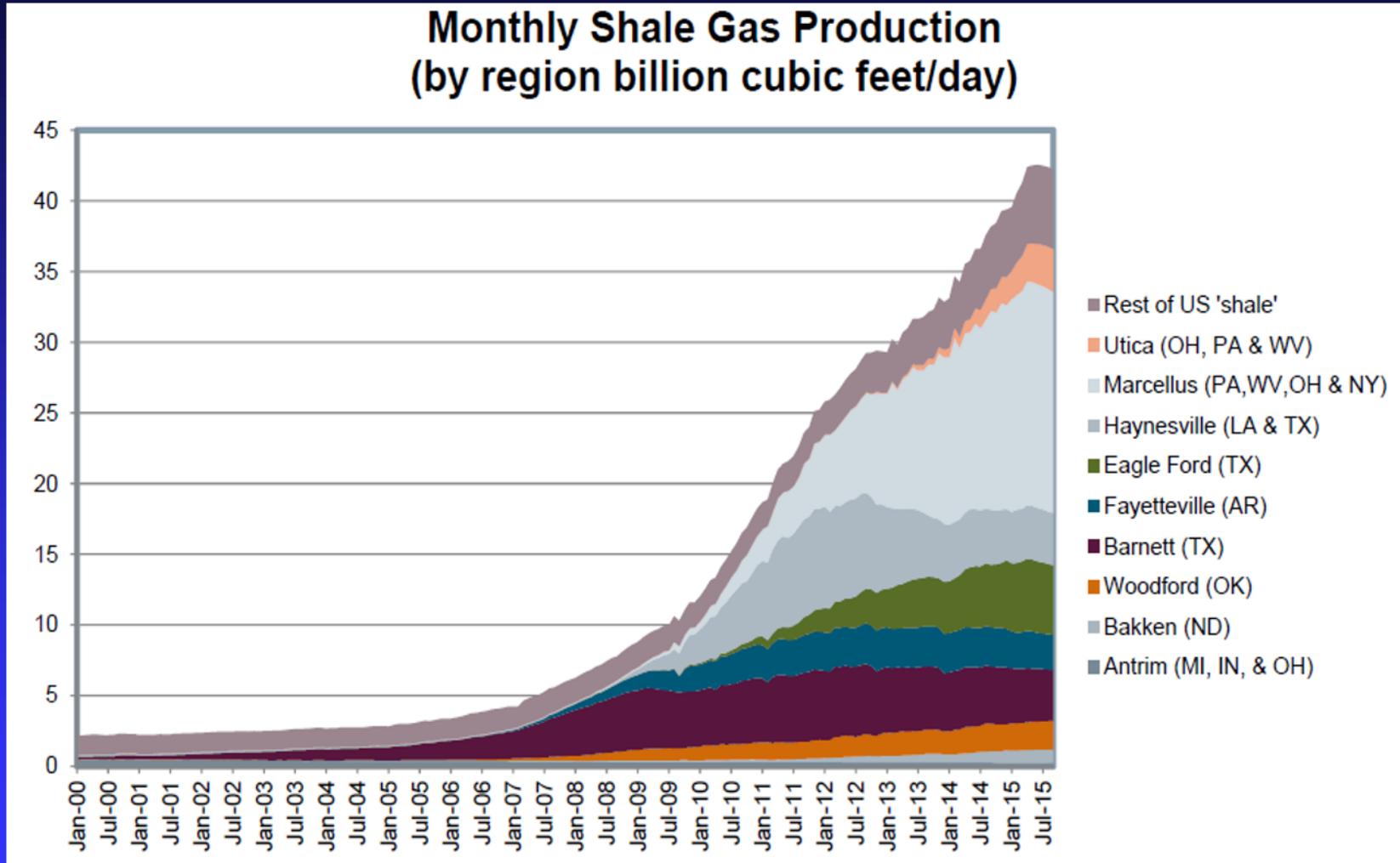
# Coal & Gas Generation Trends



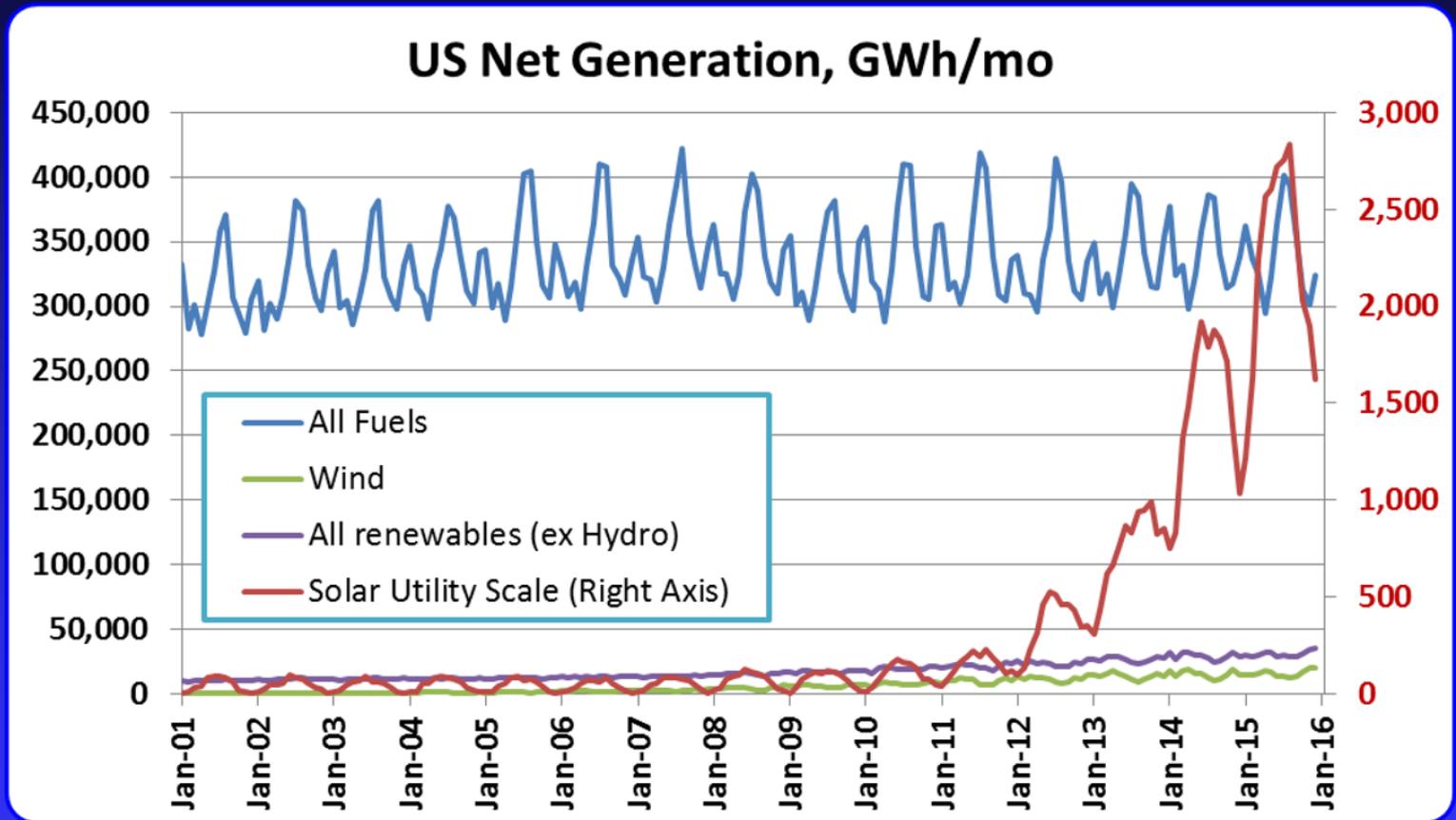
# Shift in US Nat Gas Production



# Gas Production by Shale Basins

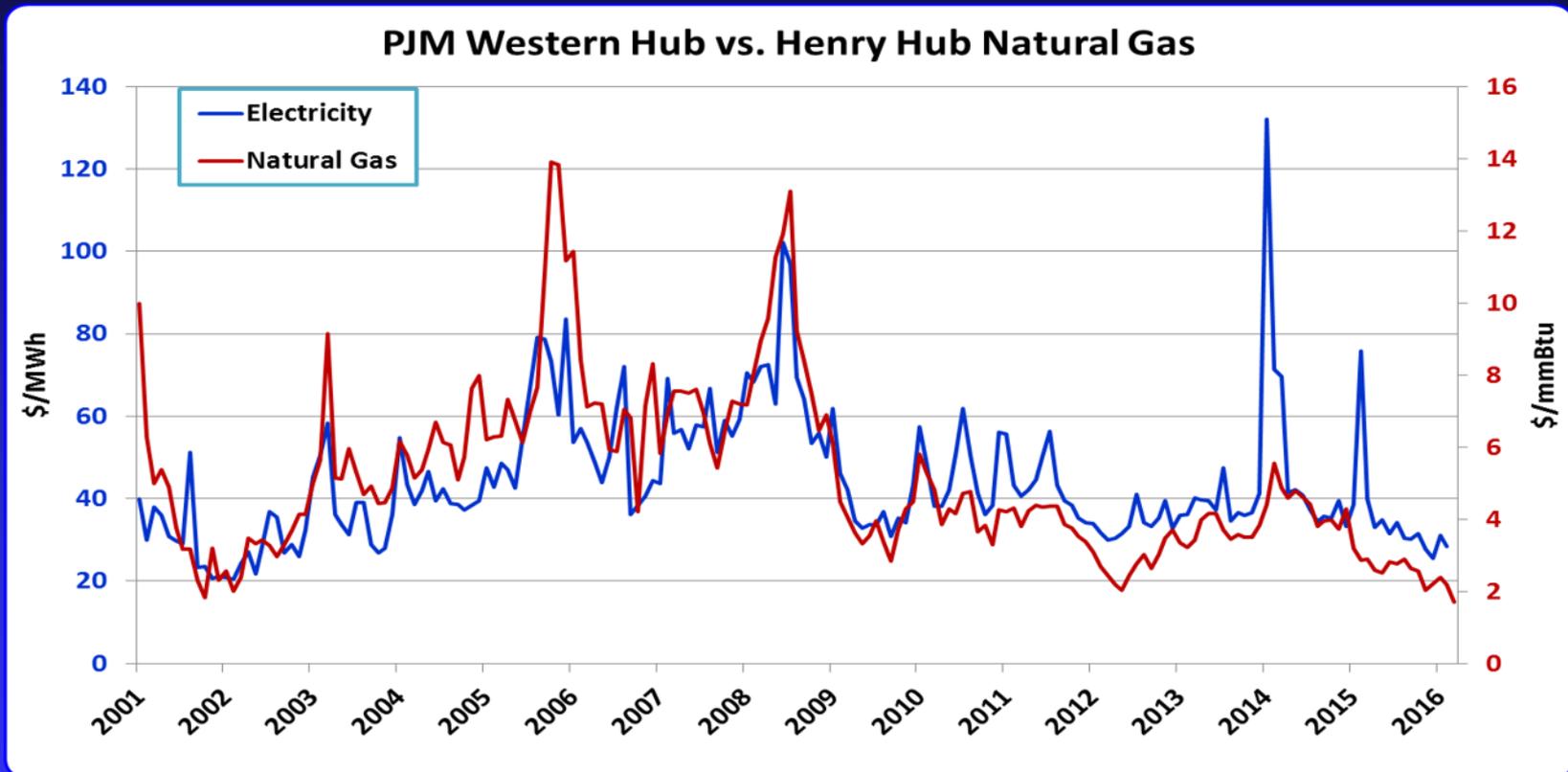


# Generation by Selected Sectors



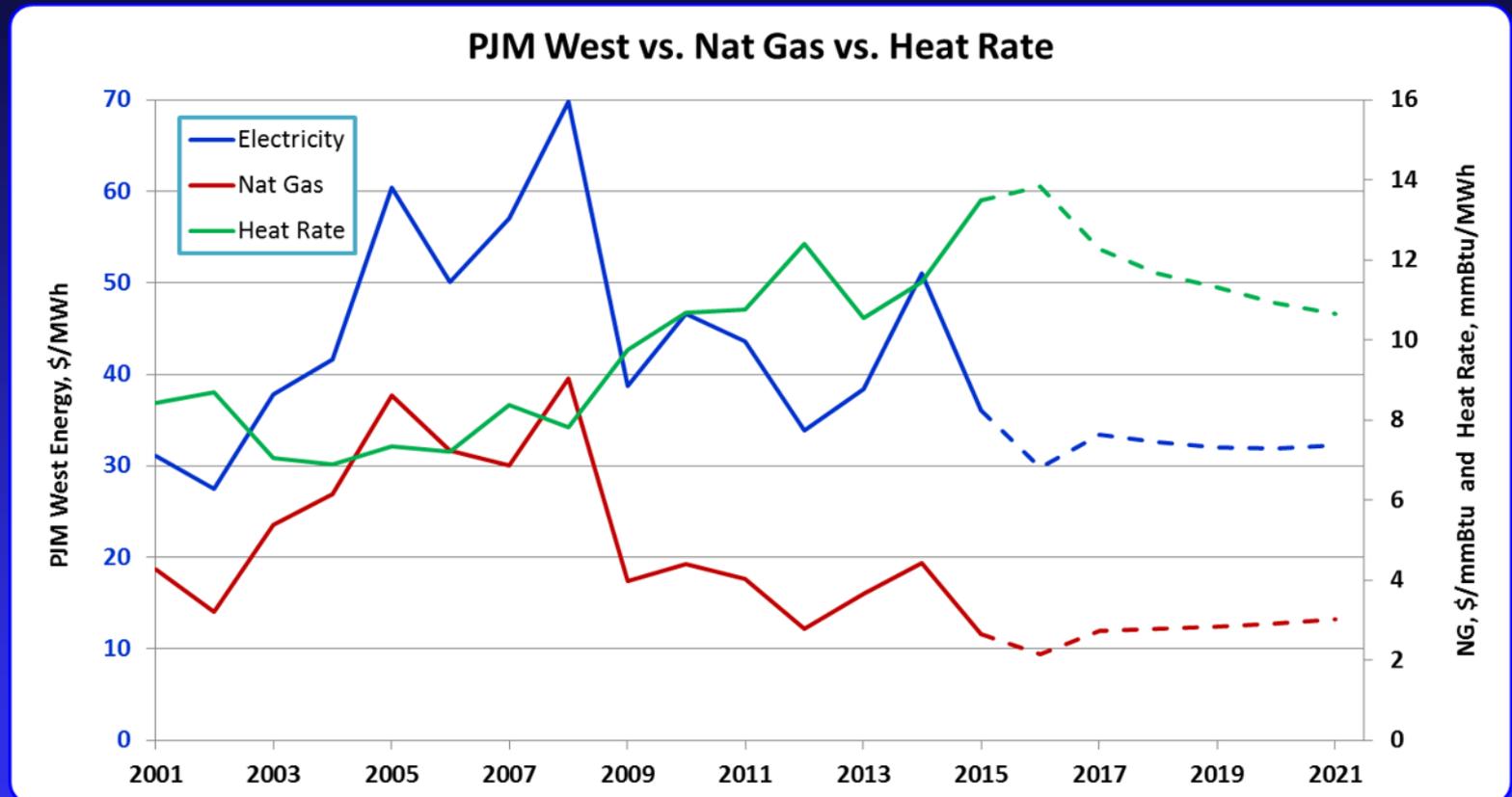
- Flat Generation, Rising Renewables
- Strong Solar PV Ramp, but still <1% of net generation

# Wholesale Electricity & Natural Gas



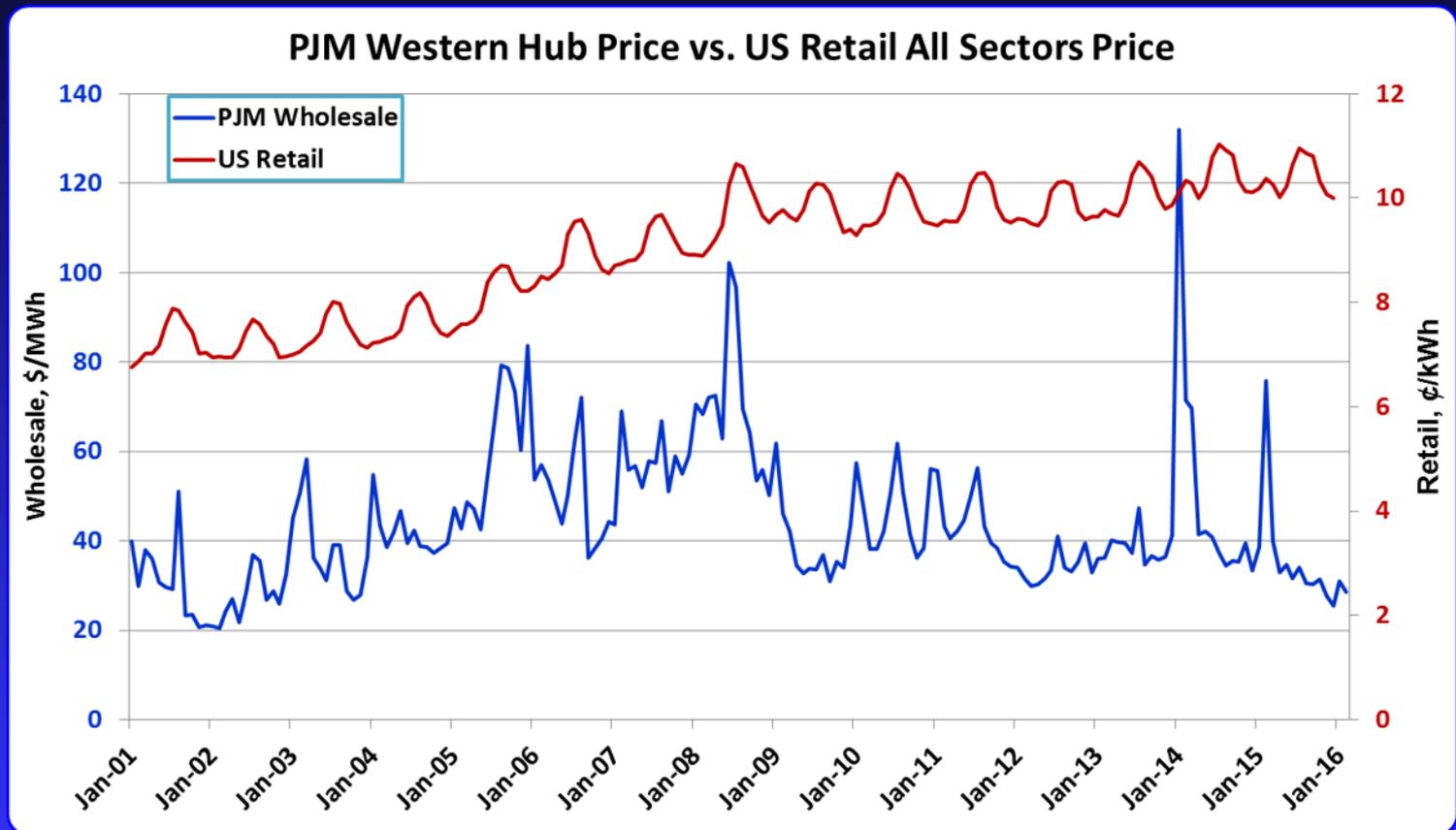
- Natural Gas price drives PJM wholesale electricity price
- This general correlation exists in most US electricity markets

# Implied Heat Rate



- Implied Heat Rate pre-2009 is reasonably stable
- Heat Rate increase post-2009 may reflect less coal and higher cost generation with more gas on the margin

# Wholesale vs. Retail Electric Prices

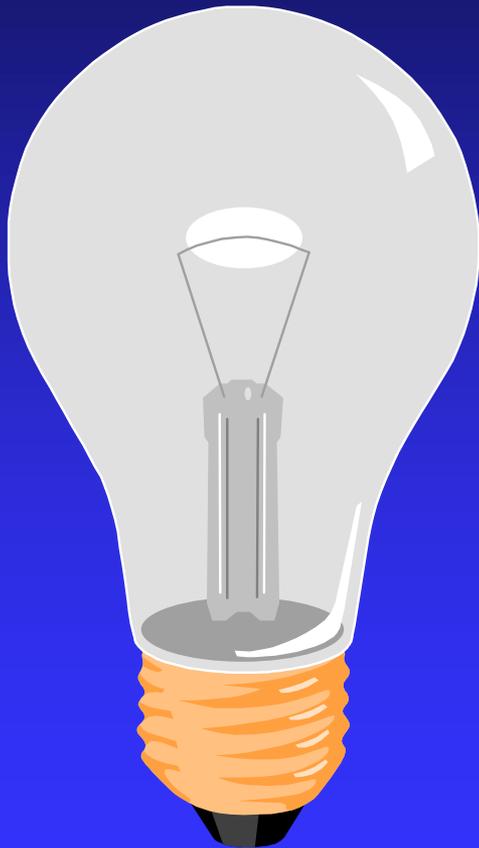


- Retail responds to Wholesale price as natural gas rises into 2008
- The Great Recession and lower gas prices saw Retail prices remain high to offset flattening demand

# In Conclusion

- Traditional utility business model disruption will affect states and utilities that are not proactive
- Some utilities are stepping forward into the future, but most are focused on trying to preserve their current high rates of return status with support from their state regulators
- The potential for utility “Death Spiral” is not a market-wide prognosis, but may well visit the change deniers in due time
- Wind/Solar will continue to be the major supplier of renewable energy with continuing lower capital costs
- Generators must pursue customers at the retail level for more favorable pricing for landfill gas production output
- Where available, the capacity market is mandatory for sustained economic operation of generation
- LFGTE capital costs & energy conversion rates must both be lowered to compete in the future electric market
- Otherwise, the future electric energy market may not be kind to LFGTE generators.....

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*Complete Energy Solutions*