REINHOLD ENVIRONMENTAL Ltd.

2013 APC Round Table
& Expo Presentation

July 8-9, 2013, in St. Louis, MO / Hosted by Ameren

Coal Plant Operations Today & Into the Future

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July 8, 2013   2013 APC Conference   Chuck Naslund, EVP, Corporate Ops Oversight

AGENDA

- Ameren Corporation Overview
- Challenges for Coal Plant Operations – Today
  - Production Cost
  - Market Forces
  - Environmental
- Challenges for Coal Plants – Future
  - Ameren's Point of View
  - Retirements
  - Key Takeaways

AMEREN CORPORATION - OVERVIEW

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A diversified regional electric and gas utility
- 2.4 million electric and 933,000 gas customers
- 15,800 MW total electric generation capacity
- ~$9 billion equity market capitalization
- Component of S&P 500

Ameren MISSOURI

Ameren ILLINOIS

Ameren TRANSMISSION

Ameren ENERGY RESOURCES

Rate-regulated Operations

Ameren Missouri
- Generation, transmission and delivery business
- Serves 1.2 million electric and 127,000 gas customers
- 10,300 MW of total generation capacity
  - 6,600 MW baseload coal-fired and nuclear fleet

Ameren Illinois
- Transmission and delivery business
- Serves 1.2 million electric and 806,000 gas customers

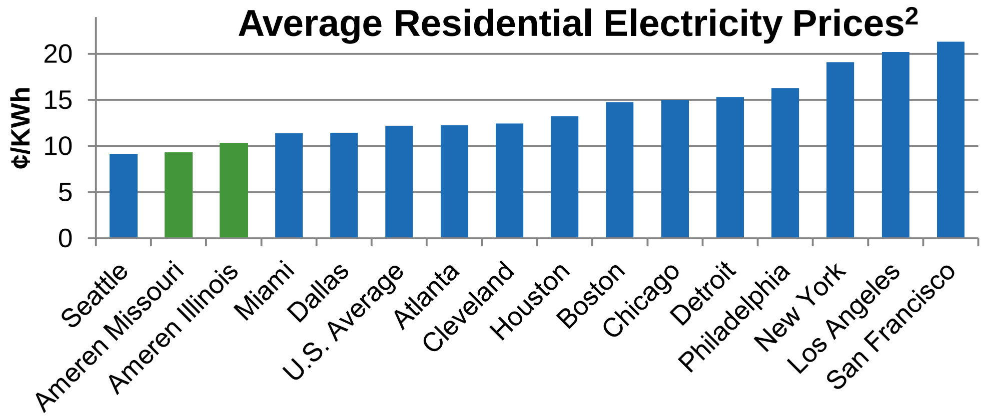
Transmission Investment
- FERC-regulated
- Three MISO-approved multi-value projects totaling >$1.3 billion (through 2019)
- Additional projects totaling ~$1.0 billion (2013-2017) at Ameren Illinois

Merchant Generation

Ameren Energy Resources
- Divesting business to affiliate of Dynegy Inc.
- Removal of $825 million principal amount of Genco debt
- Estimated $180 million net present value of tax benefits expected to be substantially realized in 2015
- Expect Q4 2013 closing of divestiture

REGULATED UTILITY OPERATIONS

- Low-cost utility operations
  - Missouri residential electric rates 24% below national average[1]
  - Illinois residential electric rates 15% below national average[1]



- Strong reliability and operating performance
  - Achieved best electric distribution reliability in company history[3] in 2012
  - Ameren Missouri baseload energy center equivalent availability 84% for 12 months ended March 31, 2013

[1] Source: "2013 EEI Typical Bills and Average Rates" report for 12 month period ending Dec. 31, 2012.
[2] Source: Bureau of Labor Statistics and "2013 EEI Typical Bills and Average Rates" report.
[3] As measured by System Average Interruption Frequency Index (SAIFI), which measures total number of interruptions per customer served.

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CHALLENGES FOR COAL PLANT OPERATIONS - TODAY

- Production Cost
  - Fuel price
  - O&M
- Market Forces
  - Natural gas prices
  - Power prices
  - Renewables i.e. wind
  - ISO's
- Environmental Issues
  - Air
  - Water & Solid waste
  - Multi-Media Impacts – undesirable consequences

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PRODUCTION COST

- Fuel dominates production cost
  - Accounts for 70-80% of production cost on PRB Units
  - Price Drivers:
    - Mine operations cost
    - Railroad costs
    - Diesel fuel
  - Mitigation
    - Fuel adjustment clause in rates
    - Term contracts to reduce volatility
    - Hedge diesel/fuel exposure (for the railroad fuel surcharge)
- Operations & Maintenance
  - Account for 20-30% of Production Cost
  - Unenviable position of having to reduce costs as units get older
  - Priorities must be established – business as usual no longer applies

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MARKET FORCES

- Natural Gas
  - Fracking is truly a game changer and gas supplies are increasing to the point FERC is approving ***export*** licenses for LNG
  - Providing true economic competition to coal in terms of pricing – especially for eastern fired units
- Power Prices
  - Demand & load are down due to economic conditions
  - Additional resources, both gas & wind, coming on line
  - Limits and changes in transmission – LMP pricing
- Renewable energy
  - Wind
  - Solar
  - Energy Efficiency

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MARKET FORCES – GENERATION MIX IS CHANGING

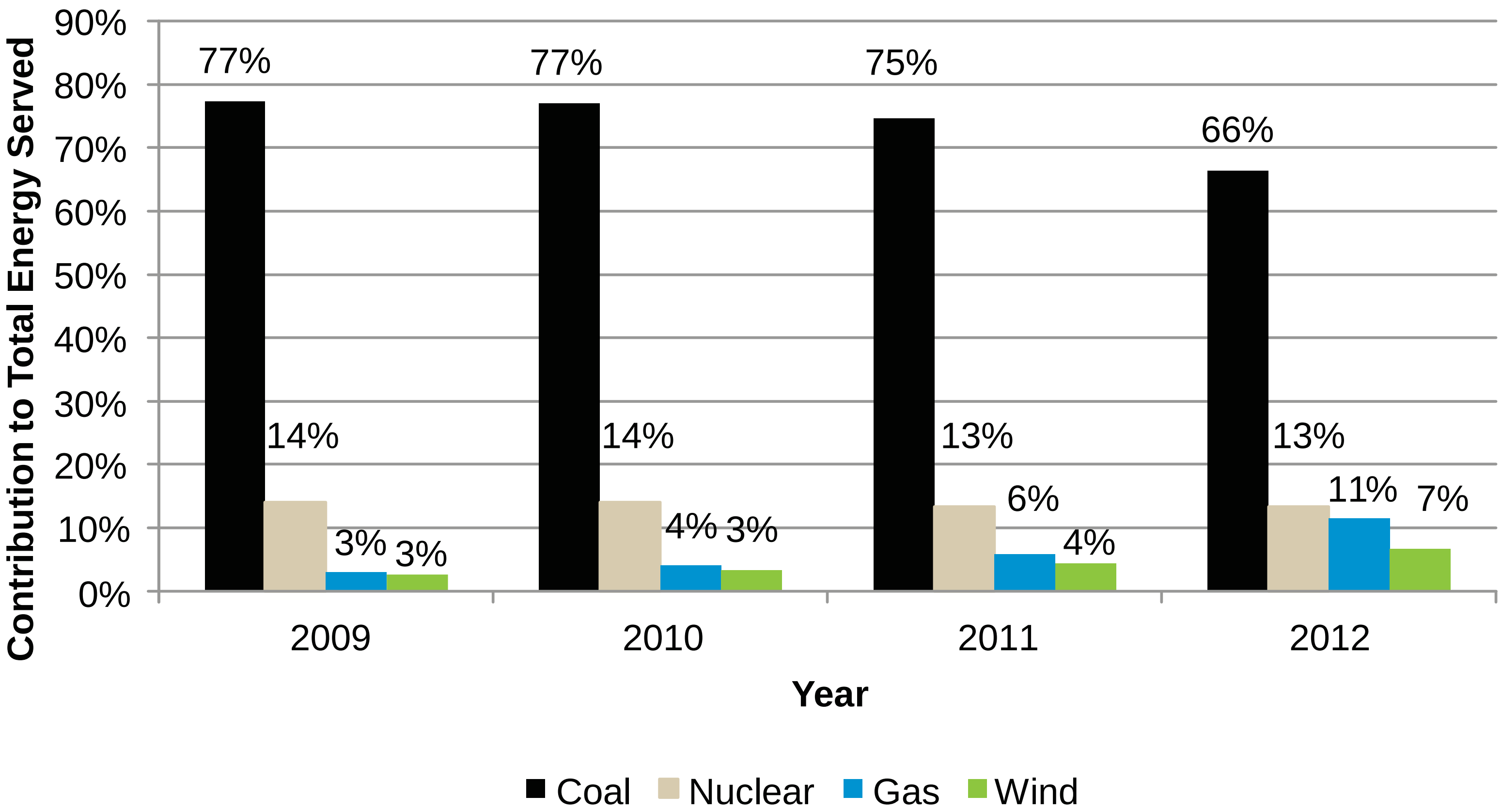

Figure 7.1-1: January through August energy contribution by fuel source

Data from MISO 2012 Transmission Expansion Plan

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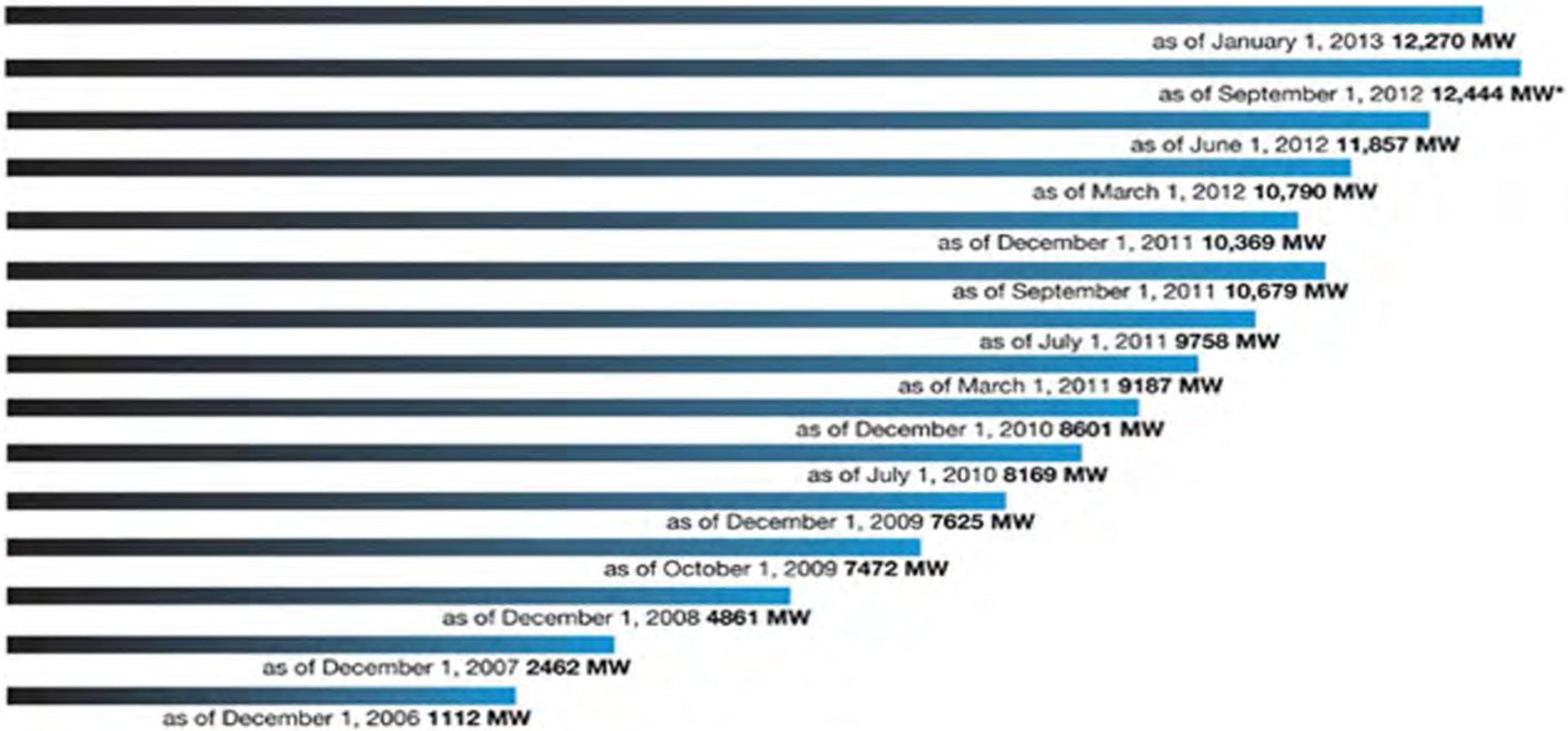
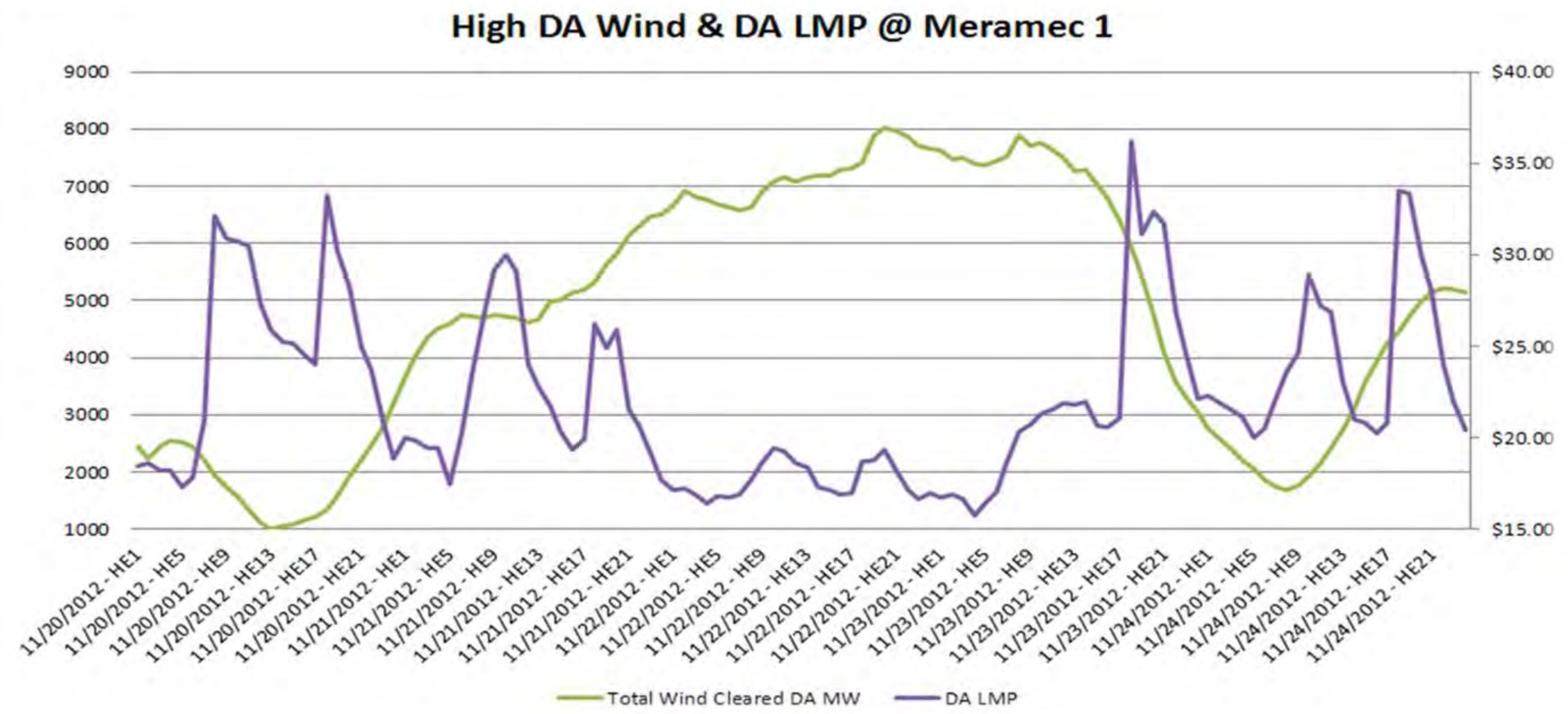
MARKET FORCES - WIND

Source: Registered wind farms in the MISO Commercial Model. In-service status subject to unit availability.



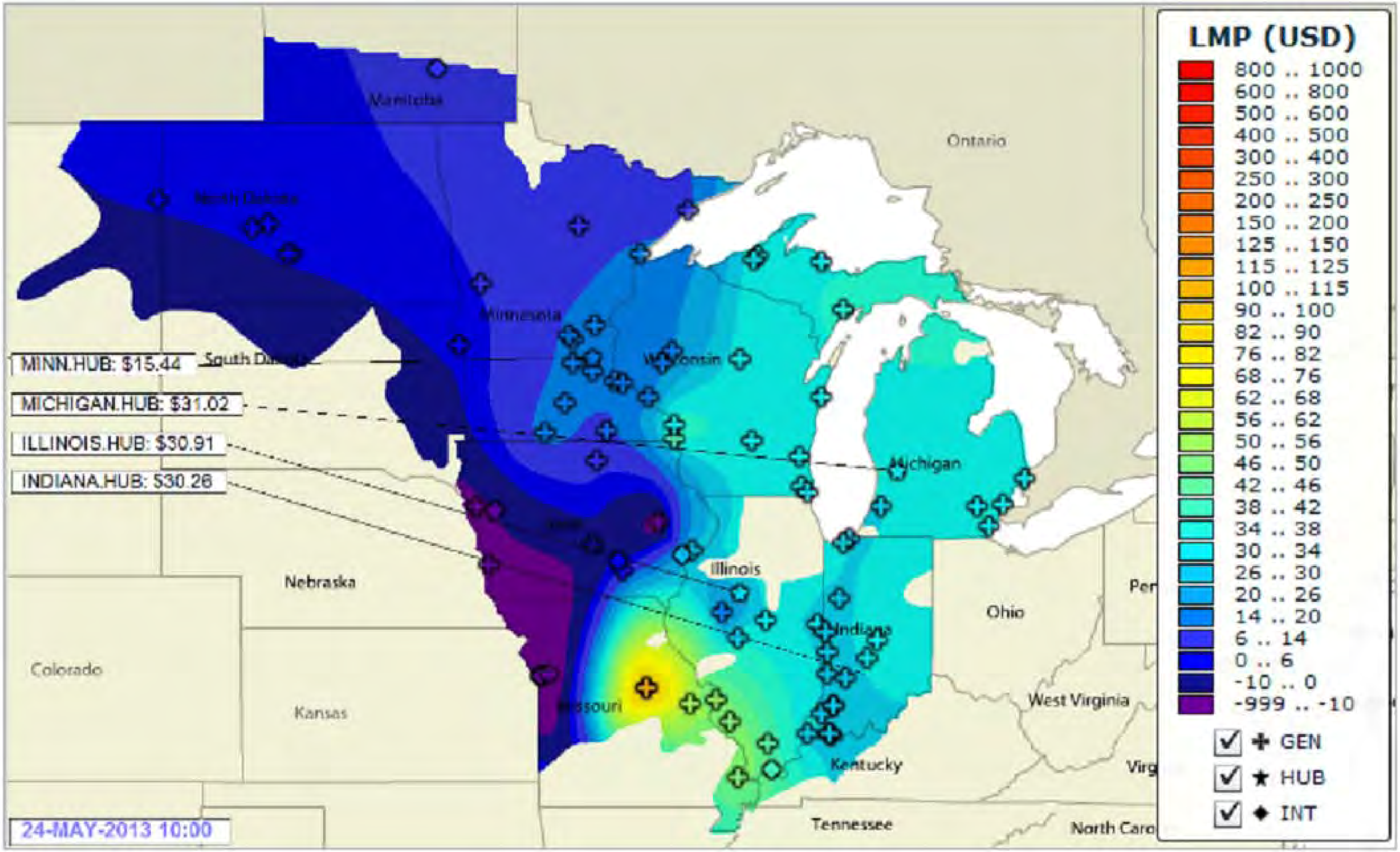
**Projected value subject to changes in federal tax credits, turbine availability, project financing*

MARKET FORCES – WIND & LMP'S



- Wind generation has a negative correlation to LMPs.

MARKET FORCES – ISO LMP PRICING



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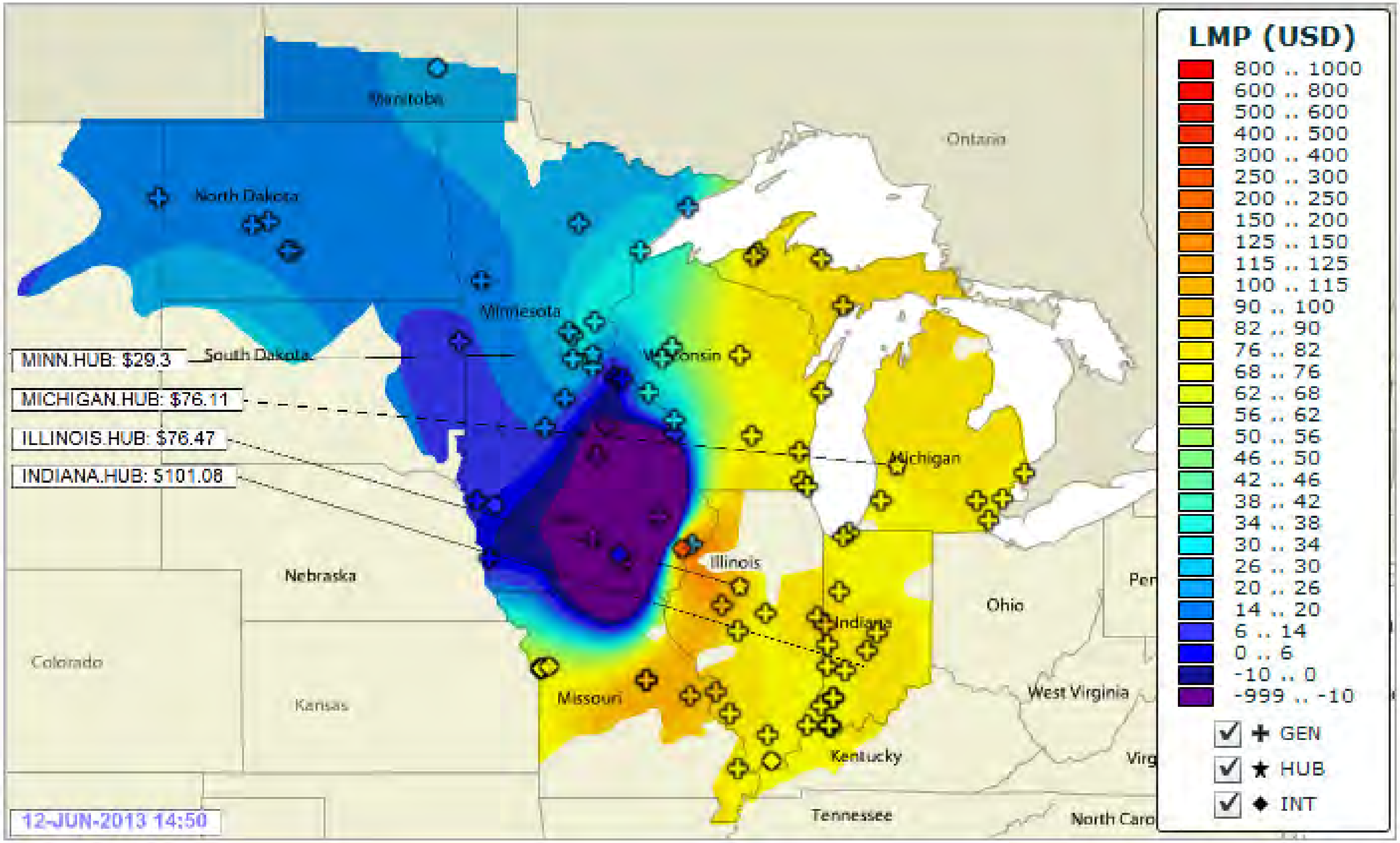

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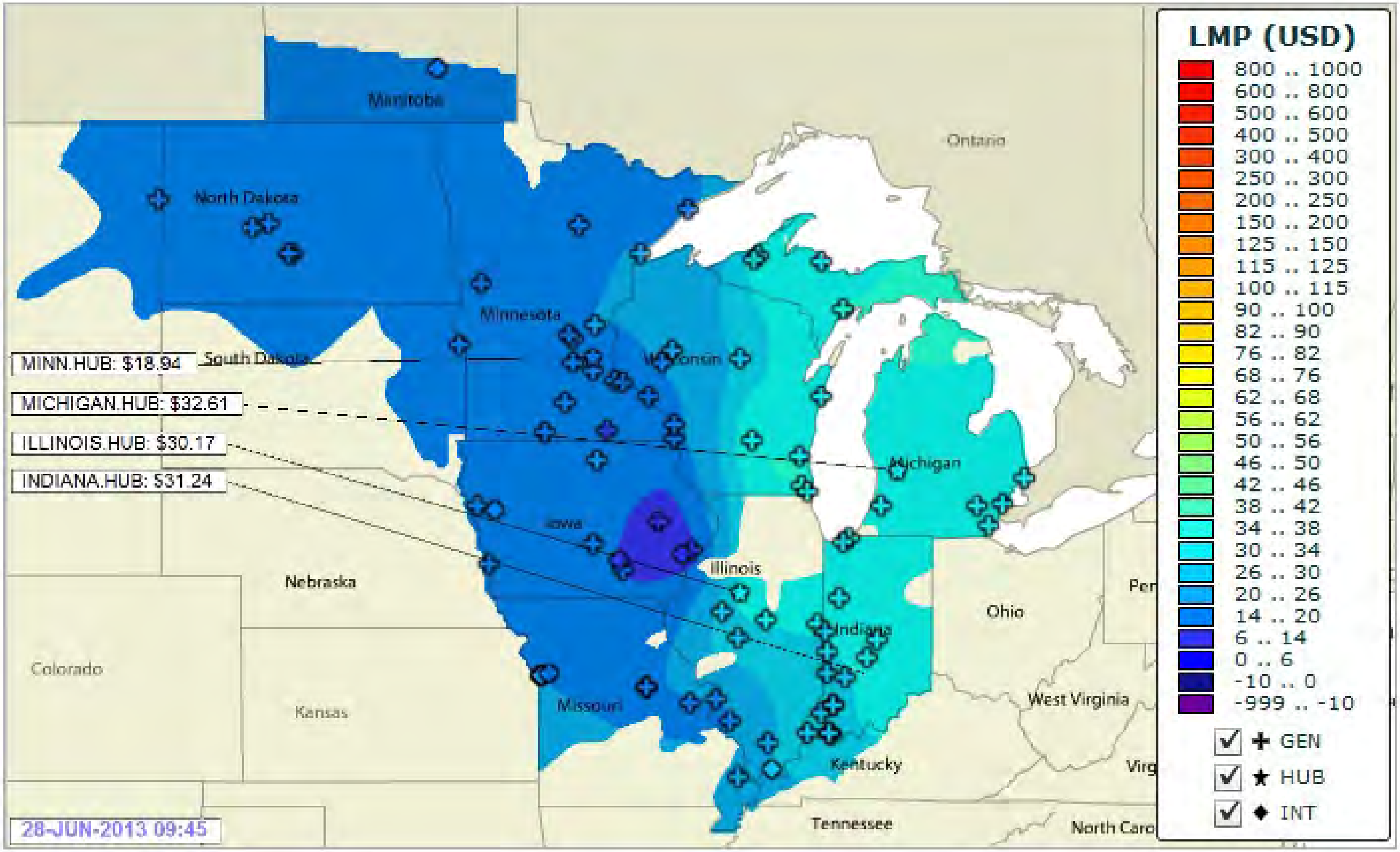

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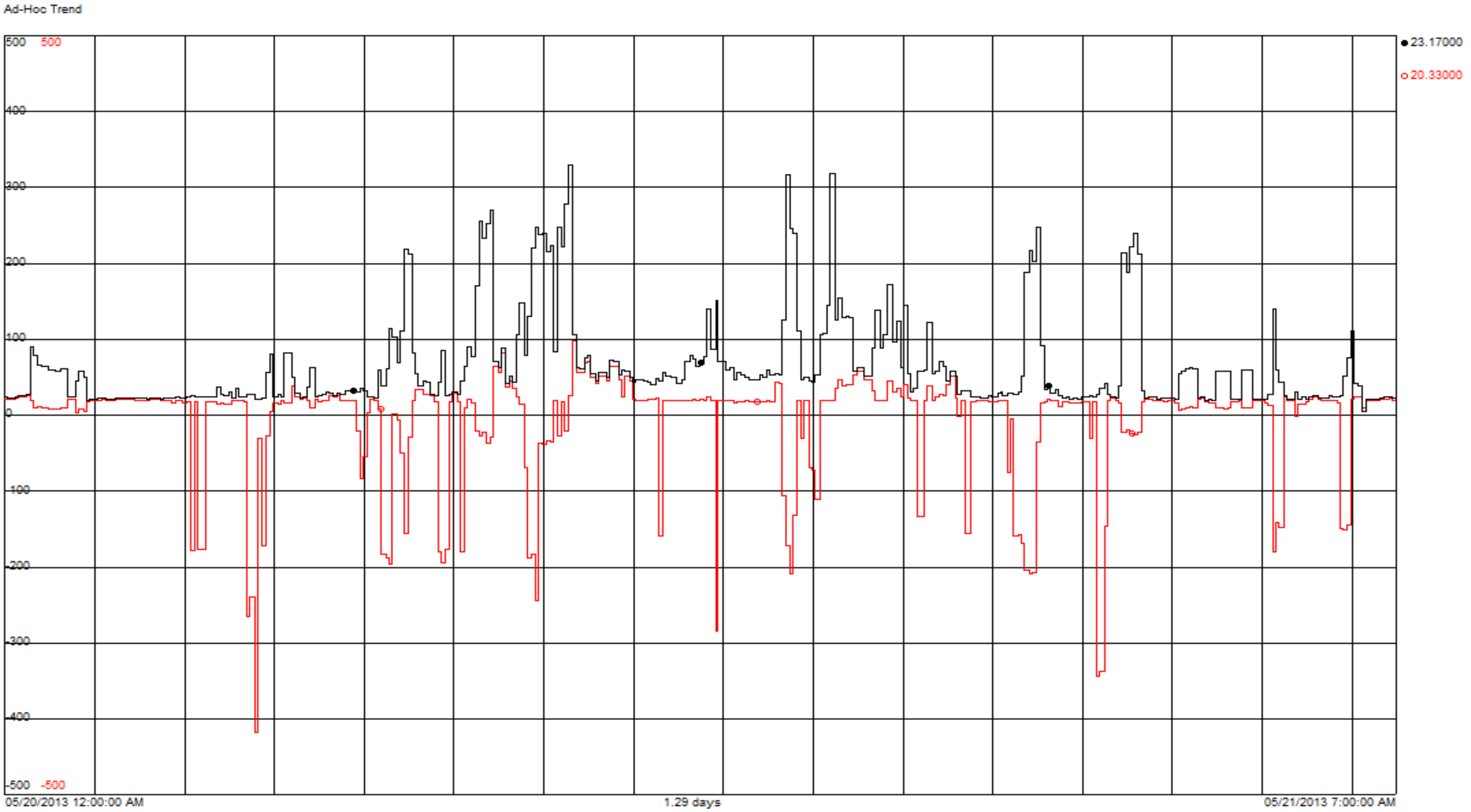
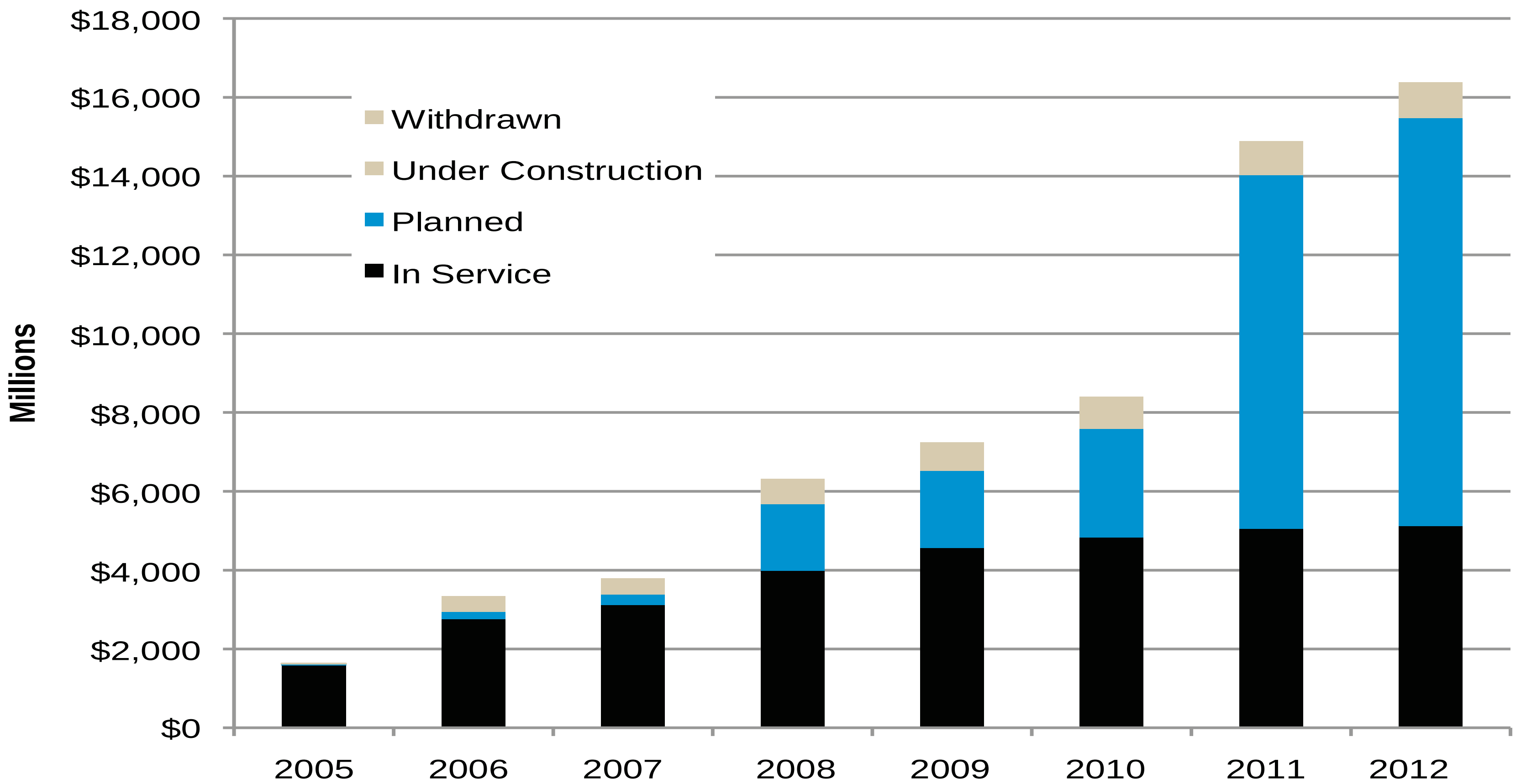
MARKET FORCES – ISO - MISO EXAMPLE

- MISO prices at Duck Creek and Edwards, 2 energy centers near Peoria Illinois.
- Transmission line OOS - prices appear to be fighting each other.



MARKET FORCES – ISO - NEW TRANSMISSION

Question 1: will new planned transmission help LMP differences?
Question 2: is this where all the cap-ex dollars are going?



MISO Transmission Expansion Plan over the last 8 years

ENVIRONMENTAL ISSUES

- Why are you here today at an Air Pollution Control conference?
  - Good food?
  - Socialize with friends?
  - Cardinal baseball?
  - Always wanted to ride up Gateway Arch?
  - Great key note speaker on agenda?
- Answer – to better understand environmental issues and impacts on your facilities.
- Areas to consider:
  - Air
  - Water & Solid Waste

ENVIRONMENTAL ISSUES - AIR

EPA Regulation	Impact	Impact
Utility MATS	NERA Analysis - $10.4B annually, $94.8B total cost, 23,000 MW retired	Cap-EX $$ O&M $$
CSAPR	Unknown at this time due to rules legal issues	Cap-EX $$ O&M $$
NAAQS	PM 2.5, Ozone, SO2, NO2 – all on varying timelines	Cap-EX $$ O&M $$
Regional Haze	Does “CSAPR = BART” exist with CSAPR legal questions?	Cap-EX $$ O&M $$
CO2 for New Units	Unknown following new Presidential Climate Action Plan.	?????????
CO2 for Existing Units	Unknown but not likely to be good	Cap-EX $$ O&M $$
BACT for GHG	Will “major modifications” trigger BACT requirements?	Cap-EX $$ O&M $$

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ENVIRONMENTAL ISSUES – WATER & SOLID WASTE

EPA Regulation	Impact	Impact
Section 316(b)	Cooling intake upgrades or cooling towers	Cap-EX $$ O&M $$
Section 316(a)	Potential for cooling towers	Cap-EX $$ O&M $$
Effluent Limitations Guidelines	Dry flyash and bottom ash conversions, WWT	Cap-EX $$ O&M $$
CCR	Pond closures, new landfills	Cap-EX $$ O&M $$

COMMON THEME SIGNIFICANT COST IMPACTS

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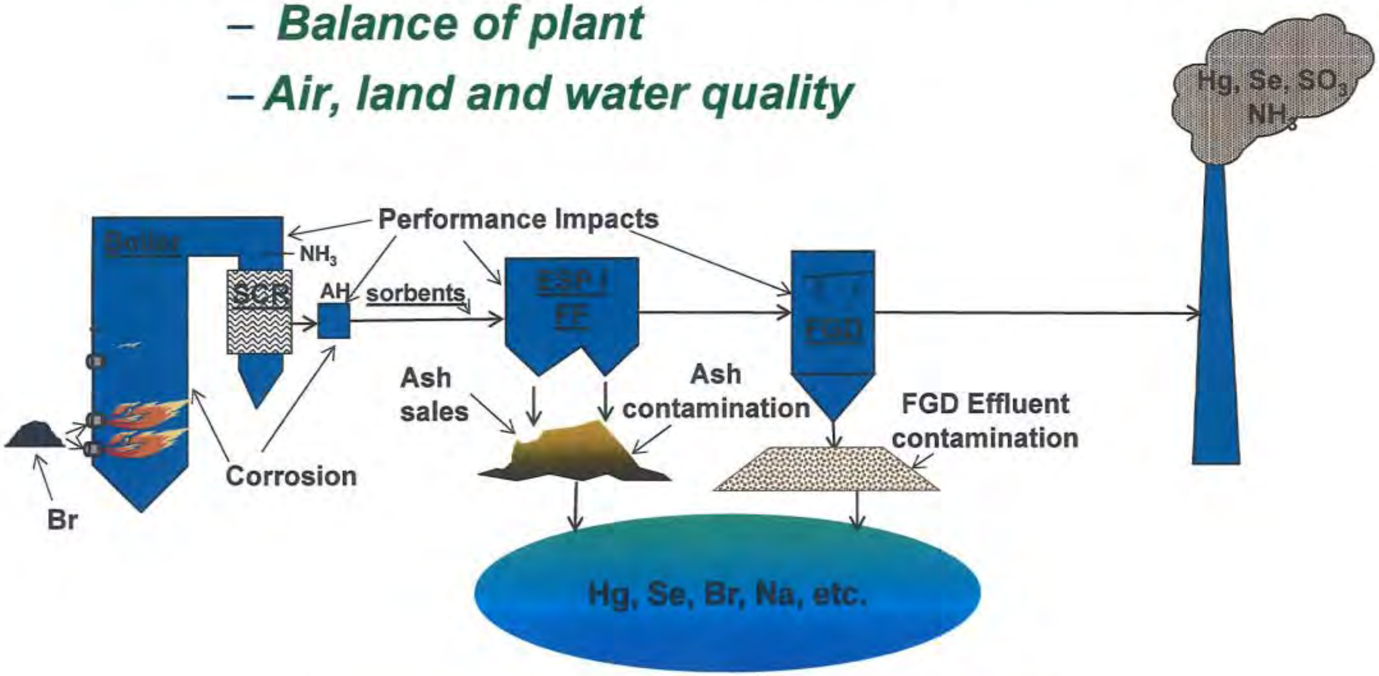
ENVIRONMENTAL ISSUES – MULTI-MEDIA IMPACTS

What Are Multi-Media Impacts?

Undesirable consequences of environmental controls

- ***Balance of plant***
- ***Air, land and water quality***



Holistic Solutions Will Be Needed!

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

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ENVIRONMENTAL ISSUES – MULTI-MEDIA IMPACTS

- SCR
  - Increased SO2 to SO3 conversion
  - Increased CPM emissions from ammonia slip
- Boiler bromine injection
  - Boiler & FGD corrosion issues
  - Increase in selenium in FGD slurry impacts water discharges
- Activated Carbon
  - Loss of ash sales
  - Potential increase in particulate emissions
- Trona & SBC
  - Loss of ash sales
  - Leachate issues with ponds & landfills
  - Potential increase in particulate emissions

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CHALLENGES FOR COAL PLANTS
FUTURE SCENARIO #1

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CHALLENGES FOR COAL PLANTS
FUTURE SCENARIO #2

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CHALLENGES FOR COAL PLANTS
FUTURE SCENARIO #2

AMEREN POINT OF VIEW - CHALLENGES FOR COAL PLANTS

- Advances in horizontal drilling and extraction will continue
  - Abundant natural gas supply
  - Low prices continue
- Coal-fired generation is being impacted
  - Changes coming faster than previously expected
  - Driven by combination of environmental and gas prices
- Technology innovations on grid side will grow
  - Enhanced operation and control of grid
  - Could significantly alter utility business model
- Electric Demand will continue to grow
  - Pace will be more modest than in the past
  - Slower growth limits needed investments while keeping rates low

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AMEREN POV - FUTURE OF COAL

- Coal will continue to fuel a major part of America’s electric generation but the existing fleet could experience 50-65 GW of retirements in the next 20 years.
- Few units currently in permitting will be completed, remaining units will be well controlled including FGD and SCR.
- No new coal units will be initiated due to environmental uncertainty and lack of proven, cost effective CCS technology
- Minimal coal and transportation price increases due to lower coal demand and the need to be competitive with natural gas
- Additional federal regulations for air, water and combustion by-products.
- GHG reduction requirements will primarily focus on coal but in the long run will also impact natural gas.

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AMEREN POV - WHAT DOES THIS MEAN TO YOU??

- The Good News
  - Coal will continue to provide a significant portion of the electricity in the US.
  - Coal prices will likely increase at a slower rate than natural gas.
  - Technologies to control environmental emissions are improving as are O&M cost projections. A good example here is the improved carbons being developed for mercury control.
  - Engineering and operating staffs are becoming smarter and adapting to be more competitive – learning to do more with less
- The Bad News
  - Fleets are aging, the "average" coal unit is now over 40 years old
  - Coal perceived by public and investment community as "old school technology" – little new investment likely
  - Little to no new coal construction
  - Continued pressure to reduce costs
  - Continued pressure from Environmental Groups and EPA

RETIREMENT IMPACTS

- Job loss
- Loss of rate base (regulated utilities)
- Out of business (merchant)
- Transmission system impacts
- Environmental clean-up
- Plant demolition
- Replacement cost (i.e. CT or CCCT Plant)

KEY TAKEAWAY’S

- ***Generation is in business to make money***
- ***Your role is to turn black stuff into green***
- ***Environmental costs are significant, both in capital and O&M. Your role is to keep these to a minimum***
- ***Optimize maintenance costs with limited funds***
- ***Coal may be down but is far from being dead***
- ***Quote from the movie Jerry McGuire:***

SHOW ME THE MONEY

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FOCUSED ENERGY. For Life.