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MANAGEMENT CONSULTANTS

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# Coal's Twilight Gets Expensive

July 2014

# Non-Fuel O&M per MWh Cost Trend for Coal Generators

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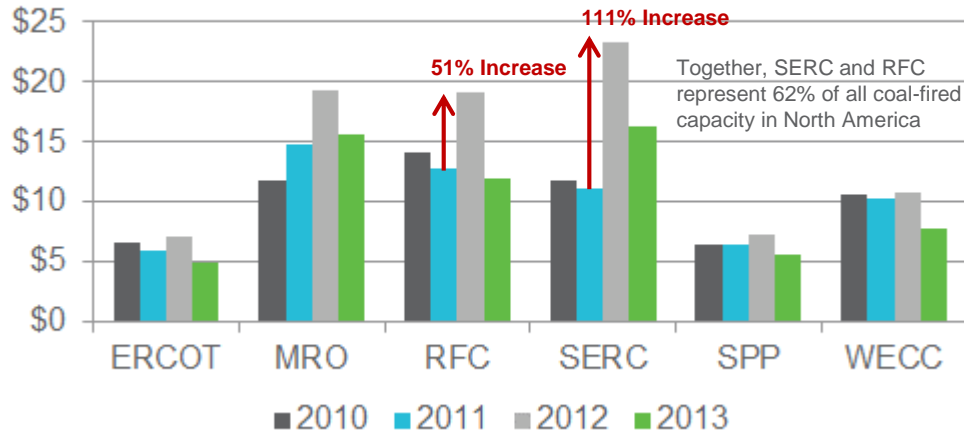
**With all the discussion about the death of “king coal,” retirements, and fuel switching, we wondered:**

- What is the overall trend for non-fuel costs for coal plants?
- Are there regional differences in non-fuel O&M costs?
- Do units slated for retirement have a different non-fuel O&M trend than those planned to continue running?

# Cost Trends in the Largest Six NERC Regions

## 2012 Was an Unusual Year

Average Non-Fuel O&M per MWh

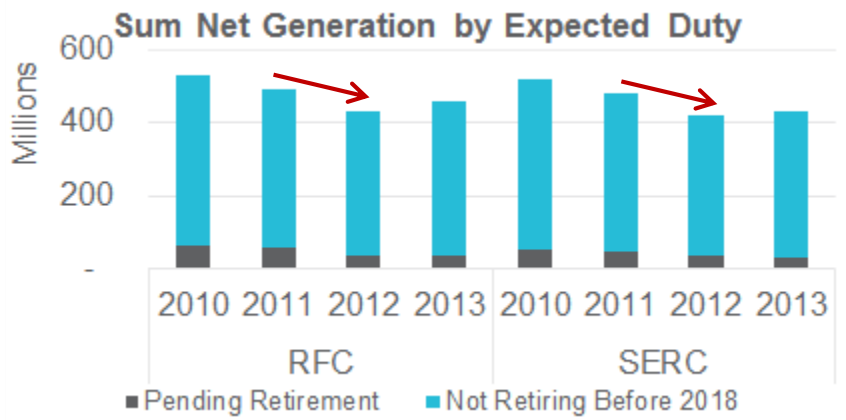


Non-fuel costs spiked in all regions in 2012 compared to 2011 and 2013, and some spiked much more than others...

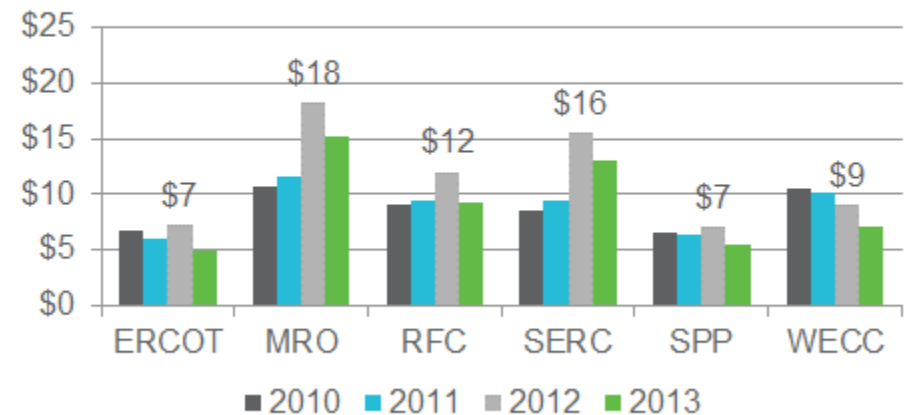
- Low gas prices (more combined-cycle dispatch and subsequently less dispatching of coal units) explains some of the difference but not the dramatic cost increases in regions with significant coal capacity (RFC and SERC)

When we look at non-fuel O&M for units not scheduled for retirement, the 2012 spike pattern remains but is much lower than the total fleet, suggesting that a lot of O&M was spent in 2012 on units slated for retirement

- 2012 cost spikes appear driven partly by fixed costs spread over fewer MWhs



Average Non-Fuel O&M per MWh (Only Units Planned for Duty Beyond 2017)

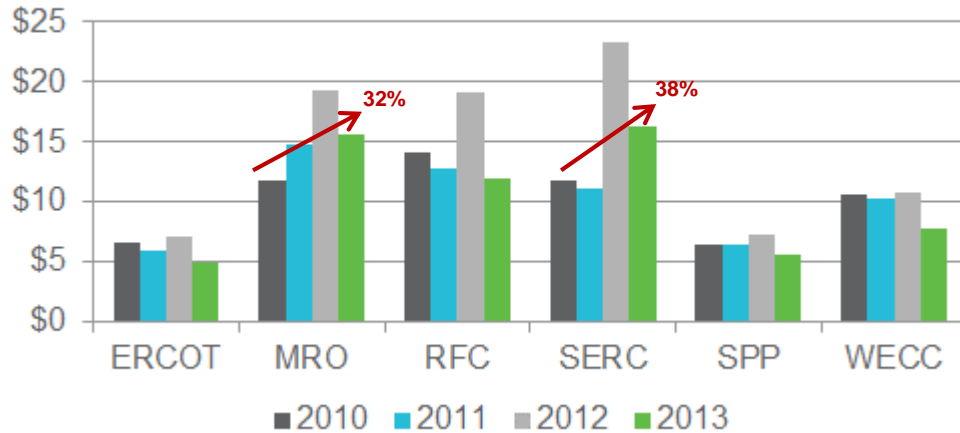


Notes: Includes all coal-fired steam turbine generating units except pet coke and waste coal-fired units; co-generating units less than 25 MWs which are not subject to EPA CEMS reporting were excluded  
Sources: Ventyx Energy Velocity Suite; ScottMadden analysis

# Cost Trends in the Largest Six NERC Regions

## Costs Decreased in 2013, Some Less Than Others

Average Non-Fuel O&M per MWh



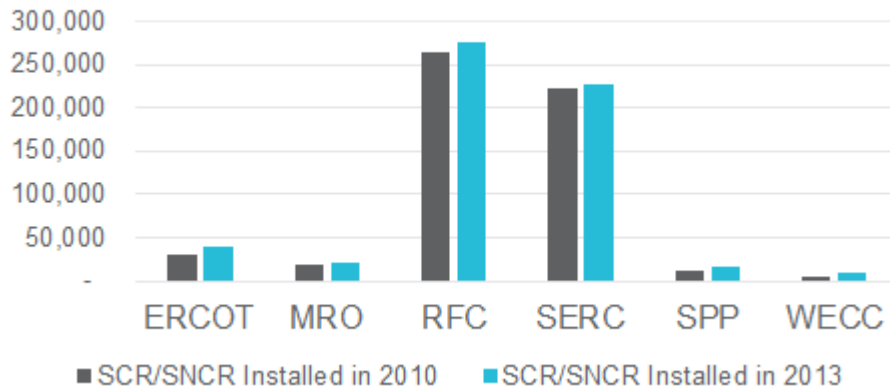
While costs for MRO and SERC were lower in 2013 than 2012, they are up substantially since 2010, unlike the other four regions we examined. Could installation of advanced air quality control systems be responsible?

- Installed NOx equipment has been stable since 2010 for all regions, so it is unlikely this is the cost driver
- Installed SO<sub>2</sub> equipment is up substantially in SERC and RFC but not MRO

If advanced air quality control controls are not causing the cost increases in MRO and SERC, then a continued reliance on units slated for harvest is a likely explanation

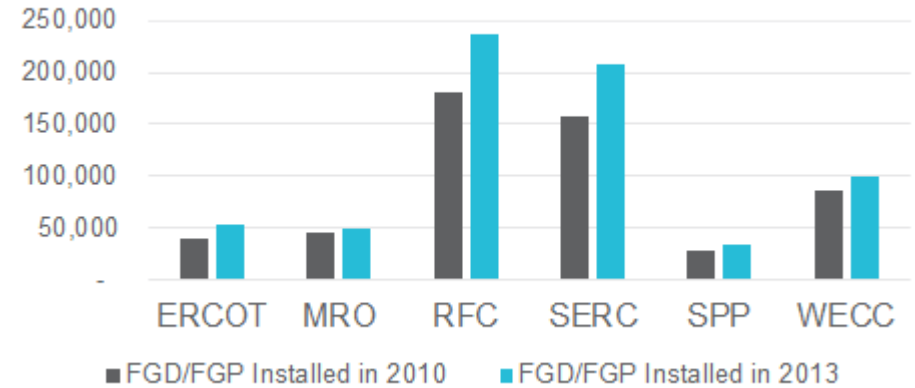
NOx Control Equipment Installed by Capacity

Latest Technology NOx Controls (MWs) - 2010 vs. 2013



SO<sub>2</sub> Control Equipment Installed by Capacity

Latest Technology SO<sub>2</sub> Controls (MWs) - 2010 vs. 2013



Notes: Includes all coal-fired steam turbine generating units except pet coke and waste coal-fired units; co-generating units less than 25 MWs which are not subject to EPA CEMS reporting were excluded  
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