Implications of EPA Policy

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Power Generation Mix – 1980
- Coal: 51%
- Natural Gas: 15%
- Nuclear: 11%
- Hydro: 12%

Power Generation Mix – 1990
- Coal: 52%
- Natural Gas: 12%
- Nuclear: 19%
- Hydro: 10%

Power Generation Mix – 2000
- Coal: 52%
- Natural Gas: 16%
- Nuclear: 20%
- Hydro: 7%

Power Generation Mix – 2009
- Coal: 45%
- Natural Gas: 23%
- Nuclear: 20%
- Wind: 2%

Source: EIA, Credit Suisse Estimates

Source: Credit Suisse estimates, EIA Data
Half of U.S. Generation capacity is 30 years old with over 63% of coal and nuclear generation at least 30 years old

Source: EnergyVelocity, Company Data, Credit Suisse Estimates
### EPA Calendar

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<td>7/10/2010 CATR proposed</td>
<td>2Q 2011 Final Rule</td>
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<td>Potential Delayed HAPs MACT</td>
<td>2011 Draft Rule 2012 Final Rule</td>
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- We assume a 2 year “grace” period for compliance with new EPA rules, largely to support system reliability and logistical timing challenges of retrofit and newbuild programs.

- Compliance delay arguments are heavy on ‘myth’ – Presidential 2-year delay, Congressional action, EPA discretion.
Of the 340 GW US coal fleet:

- 168 GW lack scrubbers (of which 103 GW lack any controls)
- 70% of coal fleet (238 GW) is over 30 years old and 33% (114 GW) is over 40 years old
More than 70% of small coal plants (72 GW) were built over 40 years ago and should be mostly depreciated

- 50% lack any control equipment (50 GW) versus 30% for all US coal plants

- 19 GW lack scrubbers leaving even more exposure to mercury
Our Coal Plant Closure Assumptions

- **60 GW**: Our Base Case of closures, equating to all of the <300 MW coal plants lacking any environmental controls and half of the <300 MW just lacking a scrubber.
- **35 GW**: Our Low Case assumes half of all small plants lacking scrubbers (69 GW) are closed.
- **100 GW**: Our High Case assumes all plants lacking any control equipment (scrubbers and SCR) are closed.

For earnings estimates we also ran a 60 GW closure scenario that used mark-to-market (MTM) commodity prices to put impact into today’s context.

**We should note our closure assumptions will still require a significant portion of the US Coal fleet to require environmental capex to meet EPA emissions targets.**
Coal-Gas Parity: 2012 Forwards

On an electricity equivalent basis, looking out the forward curve coal prices at a premium to natural gas for the first sustained period in time.
EPA Implied Utilization Rates and Capacity / Generation

Utilization Rates: 2015 vs 2010

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<tr>
<th>Year</th>
<th>Coal Utilization</th>
<th>Gas Utilization</th>
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<tbody>
<tr>
<td>2010</td>
<td>63%</td>
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<tr>
<td>2015</td>
<td>74%</td>
<td>52%</td>
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</table>

% Capacity and Output Changes: 2015 from 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal Capacity Change</th>
<th>Gas Capacity Change</th>
<th>Coal Gen Output Change</th>
<th>Gas Gen Output Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>-35%</td>
<td>-14%</td>
<td>-5%</td>
<td>-25%</td>
</tr>
<tr>
<td>2015</td>
<td>35%</td>
<td>14%</td>
<td>5%</td>
<td>15%</td>
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Source: Credit Suisse estimates, EPA
Coal to Power Economics vs Fwd Power Curve

Source: Credit Suisse estimates, Factset
Newbuild Generation Forecast (2013 – 17)

- We forecast new generation construction to meet some lost capacity needs, although replacements will likely be well below retirements as 20%+ reserve margins are inevitably tightened.
- Our 60 GW retirement scenario would require 24 GW of newbuild to support regional reserve margins at 15%.
- Incremental newbuild will be required for demand growth.

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<tr>
<td>MW to Retire</td>
<td>60 GW</td>
<td>35 GW</td>
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<tr>
<td>PMJ</td>
<td>24</td>
<td>12</td>
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<tr>
<td>ERCOT</td>
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<td>ISO New England</td>
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<tr>
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<td>SERC</td>
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<tr>
<td>SPP</td>
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<td>2</td>
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<tr>
<td>US</td>
<td>60</td>
<td>30</td>
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Source: Credit Suisse estimates, Factset
Putting in Context: Newbuild Needs vs. History

- Newbuild requirements to support 15% reserve margins after EPA impacted plant closures looks manageable over the next 5-7 years after huge construction programs throughout the last decade.
Emission Control Construction Activity

- Active construction cycle for environmental equipment before ramping to address the remaining uncontrolled US generation fleet

**Source:** Credit Suisse estimates, EnergyVelocity
Steam coal demand could fall by 157-324 MM tons annually (15-31%) depending on retirement assumptions.
Natural gas demand could grow by 5.0-10.2 Bcf/d to replace electricity produced from retiring coal plants.
Layering a reasonable coal plant closure scenario with sustained power demand growth served by gas generation could see growth of 11.8 Bcf / d.

Source: Credit Suisse estimates, Factset
Analyst Profile

Daniel L. Eggers is a Managing Director of Credit Suisse in the Investment Banking division, based in New York. He is a member of the Equity Research department and leads the US Electric Utilities team, covering a universe of thirty Regulated Utility, Integrated Power and Independent Power Producer stocks. In addition, Mr. Eggers has macro coverage responsibilities for the Power sector as well as wind energy and carbon policy.

Mr. Eggers was ranked number three in the 2009 Institutional Investor Poll, first in Earnings Estimation and second in Stock Picking in the 2010 Starmine Awards in his sector, and in previous years, has received multiple top three rankings in the Starmine analyst surveys. In 2008, he was awarded the Farsight Award for outstanding Long-term and Extra Financial Investment Research.

Prior to his current responsibilities, Mr. Eggers covered fifteen companies within the Institutional Investor and Greenwich ranked Oil Service and Equipment team. Mr. Eggers joined Credit Suisse in 1997 as an Associate on the top ranked Integrated Oils and Independent Refiners group.

Mr. Eggers received his BBA in Finance with Honors from Texas Christian University and was awarded the Chartered Financial Analyst designation in 2000.
Disclosures
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Companies Mentioned (Price as of 19 Apr 11)

Alliant Energy Corp. (LNT, $38.11) 
Ameren Corp. (AEE, $28.28) 
American Electric Power Co., Inc. (AEP, $35.13, OUTPERFORM, TP $40.00) 
Black Hills Corporation (BHK, $32.64, NEUTRAL, TP $33.00) 
CenterPoint Energy, Inc. (CNP, $17.61, OUTPERFORM, TP $20.00) 
Central Vermont Pub Serv (CV, $22.97) 
CMS Energy (CMS, $19.94, OUTPERFORM [V], TP $21.00) 
Con Edison (ED, $50.15, NEUTRAL, TP $48.00) 
Constellation Energy Group Inc. (CEG, $32.99, RESTRICTED) 
Dominion Resources (D, $44.31, NEUTRAL, TP $39.00) 
DPL (DPL, $27.59) 
DTE Energy (DTE, $48.70, NEUTRAL, TP $47.00) 
Duke Energy (DUK, $18.22, NEUTRAL, TP $17.00) 
Edison International (EIX, $38.18, NEUTRAL, TP $37.00) 
El Paso Electric Co (EE, $29.79) 
Entergy Corporation (ETR, $67.13, NEUTRAL, TP $77.00) 
Exelon Corporation (EXC, $40.29, NEUTRAL, TP $47.00) 
FirstEnergy (FE, $38.52, OUTPERFORM, TP $43.00) 
Great Plains Energy (GXP, $19.73) 
Integris Energy Group Inc (TEG, $49.68) 
ITC Holdings Corp (ITC, $67.75, OUTPERFORM, TP $72.00) 
Minnesota Power Inc. (ALE, $38.76) 
NextEra Energy Inc. (NKE, $54.89, OUTPERFORM, TP $58.00) 
Northeast Util (NU, $33.65) 
NSTAR (NST, $43.97) 
NV Energy Inc (NVE, $14.67, NEUTRAL, TP $15.00) 
OGE (OGE, $50.61) 
Pepco Holdings Inc. (POM, $18.16, RESTRICTED) 
PG&E Corporation (PCG, $44.74, OUTPERFORM, TP $50.00) 
Pinnacle West Capital Corp. (PNW, $42.40, OUTPERFORM, TP $47.00) 
Progress Energy (PGN, $46.00, NEUTRAL, TP $40.00) 
Public Services New Mexico (PNM, $14.59) 
PSE & Clouds (PSE, $50.52, OUTPERFORM, TP $36.00) 
RR Energy Inc. (RR) 
SCANA Corporation (SCG, $39.08) 
Sempra Energy (SRE, $52.96) 
Southern Company (SO, $38.19, NEUTRAL, TP $39.00) 
TECO Energy (TE, $18.46, NEUTRAL, TP $16.00) 
Unisource Energy Corp (UNS, $35.48, NEUTRAL, TP $34.00) 
Wisconsin Energy (WEC, $29.70)

Disclosure Appendix

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**An analyst’s coverage universe consists of all companies covered by the analyst within the relevant sector.

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Underweight: Industry expected to underperform the relevant broad market benchmark over the next 12 months.

*An analyst’s coverage universe consists of all companies covered by the analyst within the relevant sector.

**The broad market benchmark is based on the expected return of the local market index (e.g., the S&P 500 in the U.S.) over the next 12 months.

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