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## CAPITOL ANALYSTS NETWORK, INC.

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Stuart J. Sweet, President

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### EXPLODING ENERGY REGULATION CAN BE PROFITABLE

"I have a pen," declared President Obama, "and a phone." When he uttered this phrase, the President made clear his intention to use his discretionary regulatory powers to advance his goals. Inside player John Podesta, President Clinton's former chief of staff, has returned to the White House to help him do precisely that.

There are numerous fields where Obama can act, including health care, education, telecommunications, and trade. Today, we discuss the Obama Administration's regulatory approach towards energy generation. Whether you agree or disagree with these regulations -- and advocates point to the advantages of cleaner air and reduced reliance on foreign oil imports -- there are many ways investors can take advantage of these changes. It is an ill regulation that blows no good. We discuss tighter air pollution controls which will help considerably air pollution control specialists, the rapid build out of wind and solar power that is putting wind in the sails and sunshine in the faces of renewable energy producers, and upcoming drilling opportunities off the eastern seaboard.

#### Air Pollution Control

EPA's clean air rules and their implementation have faced numerous delays, due to challenges to agency rules brought by both environmentalists and industry groups. Recent court decisions finally have provided clarity to the industry and investors.

On April 15, 2014, the Supreme Court upheld the Mercury and Air Toxics Standards (MATS). America has 1,400 coal-fired plants. Just under 900 will be unaffected because they already use "fuel gas desulphurization" which removes mercury. MATS requires approximately 400 remaining plants to remove 90 percent of mercury emissions when they generate electricity. The estimated annual compliance cost is \$9.6 billion. Full compliance must begin by April 15, 2016. EPA believes its MATS rule will produce \$37 billion to \$90 billion annually in health benefits, including the prevention of up to 11,000 premature deaths, presented in its [EPA mercury rule fact sheet](#).

Babcock and Wilcox (BWC), Calgon Carbon (CCC), and ADA-ES (ADES), specialize in highly efficient technologies that use activated carbon to bind gaseous mercury when injected into coal-fired utility flue gas exhaust for subsequent capture in fine woven fabric "baghouses." Midwest Energy Emissions (MEEC) offers a competing, highly efficient injection technology before full combustion. All should be very busy between now and April 2016, installing their systems in coal plants. Combined with other pollution control companies, these firms should receive approximately \$10 billion annually in sustainable revenue until these 400 coal plants close, in many cases, decades from now.

Two weeks after the Supreme Court confirmed the MATS rule, the judiciary spoke again. On April 29, 2014, federal judge Yvonne Gonzalez Rogers ruled the Environmental Protection

Agency shall issue new draft standards for ground-level ozone no later than December 1, 2014, and promulgate a final rule by October 1, 2015. The judge acted because EPA must update its Ozone National Ambient Air Quality Standard every five years under the Clean Air Act. It last acted in March 2008, during the Bush Administration, when it lowered the ozone standard from 84 parts per million to 75 parts per million. Therefore, EPA is overdue and violating the Act.

Despite being late, it is clear EPA plans to tighten the standard more. On February 3, 2014, the EPA issued a draft policy assessment that recommends lowering the ozone standard to between 60 and 70 parts per million. Depending on whether the ozone standard ultimately is set at 70 ppm or 60 ppm, the EPA estimates that the cost of complying will be \$12 billion or \$80 billion above the current 75 ppm standard. EPA also calculates that implementing this standard will save \$10 billion to \$83 billion annually in the form of reduced mortality and morbidity, including prevention of 1,000 to 5,000 premature deaths annually. A [summary of proposed tighter EPA ozone rules](#) offers data on these points at Tables S1.1 and S1.2

Ground level ozone forms in unhealthy amounts when ultraviolet radiation and hot weather cook an atmospheric stew of nitrous oxides (NO<sub>x</sub>), Volatile Organic Compounds (VOCs), and carbon monoxide. Motor vehicles produce half of these ozone precursors. Reducing sulfur in gasoline is the leading approach for reducing non-stationary sources. Sulfur coats catalytic converters, destroying their effectiveness. Refiners do not like to hear this, but EPA is likely to tighten gasoline sulfur-content rules to reduce ozone.

The EPA's primary targets for ozone enforcement of stationary sources are electric utilities, industrial boilers, miners, and heavy manufacturers. They emit 70 percent of NO<sub>x</sub> stationary source gases. NO<sub>x</sub> reduction is possible by injecting water prior to combustion but to meet EPA's target, numerous entities will have to install selective catalytic reducers (SCRs) after combustion. SCRs release ammonia into 600 degree to 700 degree flue gas, changing up to 90 percent of nitrogen oxide or nitrogen dioxide present into harmless nitrogen gas and water. Some NO<sub>x</sub> emitters will have to buy larger SCRs while many of the others will have to install them for the first time. By this December, investors will know the size of the ozone prevention bonanza.

Babcock and Wilcox (**BWC**), Calgon Carbon (**CCC**), Ceko Environmental (**CECE**) and Fuel Tech (**FTEK**) are best positioned to capitalize on these EPA clean air mandates.

### **Wind and Solar Electric Energy Generation**

Reflecting expanded mercury and ozone pollution control costs, the Energy Information Agency (EIA), housed inside the Department of Energy, forecasts that 60 Gigawatts of coal-fired electric generation will be retired by 2016, 5 percent of overall electric generation. How will this hole be plugged? Expect 25 Gigawatts in net additional natural gas production and surprisingly, 35 GigaWatts of “renewable energy,” consisting of 25 in wind and 10 in solar installations.

The driving force for this mixture is not price. Except for occasional geothermal hotspots, natural gas-fired generation is the cheapest method, despite engineering advances driving down the cost of solar and wind power. The Energy Information Agency makes this point clear in its most

recent regional estimate on "levelized costs" of new generation. Levelized cost measures "all in" cost throughout the lifecycle of generation, which varies by method used to produce electricity.

**Estimated Regional Levelized Cost of Electricity (LCOE) for New Generation Resources, 2019**  
(U.S. average levelized costs in 2012 \$/MWh for plants entering service in 2019)

Plant Type	Total System LCOE	Plant Type	Total System LCOE
<b>Geothermal</b>	47.9	<b>Coal</b>	95.6
<b>Conventional Natural Gas</b>	66.3	<b>Advanced Nuclear</b>	96.1
<b>Wind</b>	80.3	<b>Solar</b>	130.0
<b>Hydro</b>	84.5		

The reason wind and solar will be built is state law. Twenty-nine states have ordered their utilities to produce renewable energy, with typical requirements of 20 percent by 2020. Hydropower is considered renewable, but, alas, there are very few meaningful places left to dam in the U.S., and so few new dams can be built to meet aggressive renewable energy targets. Therefore, drivers will see an increasing number of wind turbine farms as they ride through these 29 states over the next few years as utilities comply with state mandates. In very sunny but not windy states, solar will be built to meet the mandates because it will be cheaper. These state "renewable portfolio standards" can be found [here](#).

There are several ways for investors to invest in renewable energy. Diversified ETFs with shareholdings of both wind and solar companies, "clean" utilities, and technology include Market Vectors Global Alternative Energy ETF (**GEX**), First Trust Nasdaq Clean Energy Green Energy Index (**QCLN**), and Guggenheim Solar ETF (**TAN**). Investors can participate in wind energy pure-plays with First Trust Global Wind (**FAN**), tower and gearings manufacturer Broadwind Energy (**BWEN**), wind turbine manufacturer Vestas (**VWDRY**), and wind power project owner Pattern Energy Group (**PEGI**). Solar energy companies with significant exposure to utility-scale installations include First Solar (**FSLR**), Sunedison (**SUNE**), and Sunpower (**SPWR**).

Next, there are the "yieldcos," gaining in popularity because they own operating wind, solar or hydroelectric assets and pay above-average dividend yields. This group includes NextEra Energy Partners (**NEP**) and Brookfield Renewable Energy Partners (**BEP**). Finally, utility investors can migrate away from coal by choosing "clean" utilities such as NextEra Energy (**NEE**), which has a mix of energy that is 52% gas, 27% nuclear, 16% wind, and only 3% coal.

**Natural Gas Exploration, Development, and Exporting Companies**

Domestic production of natural gas continues to set records, with production growing 34 percent since 2004, from 18.1 trillion cubic feet to 24.3 trillion cubic feet in 2013. Government officials ([http://www.eia.gov/forecasts/aeo/pdf/0383\(2014\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2014).pdf) at page MT-24) and industry experts agree that the natural gas production surge will continue for at least three decades and outpace modest growth in consumption. More output should help Range Resources (**RRC**), Exco Resources (**XCO**), Cabot Oil and Gas (**COG**), Chesapeake (**CHK**), and Southwestern Energy (**SWN**).

It also means the U.S. will be a natural gas exporter, probably as early as 2016. By 2020, production will equal 110 percent of consumption, with the excess 10 percent being exported. The percentage exported will rise further from there. While a minor amount will be transmitted to Mexico by pipeline, the bulk of it will be liquefied and shipped to Asia or possibly Europe.

To date, thirteen U.S. and three Canadian [LNG export projects are under development](#) . Both [Cheniere and Sempra](#) have received approval by the Federal Energy Regulatory Commission (FERC) and the Department of Energy to proceed. Cheniere's LNG Sabine Pass plant, on the Texas and Louisiana border, is expected to become operational in early 2016. Strategically located near both major shale gas plays and a spider web of gas pipelines, this location also offers a secure deep water channel to the Gulf. Their facility can process for export 2.7 billion cubic feet per day of natural gas. This represents 3.6 percent of U.S. consumption. Cheniere has final approval to export 2.2 billion bcf/d and awaits final approval for the remaining 0.5 bcf/d. Two weeks ago, FERC approved Sempra's 1.7 bcf/d LNG export terminal planned for Hackberry, Louisiana. Expect more FERC LNG export approvals. Otherwise, there will be a large glut of U.S. gas later this decade with nowhere to go.

Europe imports 5.7 trillion cubic feet annually from Russia, and geostrategists are weighing the merits of committing the coming U.S. 2.5 trillion cubic feet annual surplus to Europe to ease Putin's grip. Unless Europe ups its bid, however, U.S. exporters will send their LNG to Asia where prices are higher. Either way, companies that gather, store, process and transport LNG such as Targa Resource Partners (**NGLS**), Enterprise Products (**EPD**), Oneok (**OKS**), Enbridge Inc. (**ENB**), and Williams Companies (**WMB**) should prosper.

Specialized LNG shippers such as Gaslog (**GLOG**) and Golar (**GLNG**) also will benefit. Much larger LNG carriers will be able to fit through the wider Panama Canal that goes live early next year, padding margins.

### **Offshore Oil Developers**

There two ways to boost American oil production: increase the amount that is lifted economically from known pools or develop new profitable pools. The U.S. relies primarily on the first approach, and the fracking and horizontal drilling boom has made it the largest oil producer in the world, at 11 million barrels per day. It would be higher, and imports would be lower than 7.5 million barrels per day, if the federal government would permit more vigorous development of the outer continental shelf. But according to the [American Petroleum Institute](#), drilling is not allowed in 87 percent of federal waters! This policy is especially damaging in underdeveloped offshore Alaska, which has larger untapped reserves than the Gulf of Mexico.

Another underdeveloped area is offshore the eastern seaboard. Experts believe there also are large commercial oil and gas deposits off the Atlantic coasts of Florida, Georgia, North and South Carolina, Virginia, Maryland, and Delaware. Unfortunately, none of it has been surveyed using modern techniques. Government Atlantic estimates of \$340 billion in oil and \$90 billion in gas rely on two-dimensional surveys from the late 1970s and early 1980s, which modern practice has shown missed a lot. The Interior Department has finally agreed to modern surveys, and the surveying will

begin within a year. This should be good news for Schlumberger, (**SLB**), Ion Geophysical (**IO**), and CGG (**CGG**) who specialize in performing and analyzing underwater seismic surveys.

Expect actual Atlantic lease sales in 2018, as part of the Department of Ocean Energy Management's 2017-2022 five year plan.

### **The Result: More Wind and Solar, But Less Oil and Coal**

Without the intervention of Obama and state governments, America's future energy mix would be different; we would use more coal and natural gas and almost no wind or solar power. But Obama and state governments have intervened to:

- force coal-fired utilities to capture pollutants at large cost for important health benefits
- order the build out of wind and solar capacity
- allow the export of natural gas
- open up the Atlantic seaboard to offshore drilling

As citizens, we may agree or disagree. As investors, we should take advantage of the opportunities these energetic moves create.

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**For further analysis or information, contact Capitol Analysts Network, Inc. at:**

2230 Decatur Place, N.W.  
Washington, D.C. 20008  
(202) 223-4014

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