



ENERGY MATTERS

The trusted source for objective sound-bite summaries of the energy news you need to know

Volume 19(2); September 19, 2016

Table of Contents:

[Headline News](#)

Conventional, Renewables (and Energy Quiz), Policy, Climate, Electricity and Power

[Features](#)

NRG and America's voracious appetite for power

— HEADLINE NEWS —

Conventional

Petroleum

- A massive [new oil and gas field](#) (called "Alpine High") has been discovered in the Permian Basin (West Texas) by Apache Company. It contains 75 trillion cubic feet of natural gas and more than 3 billion barrels of oil — nearly the equivalent of an entire year of US crude production.

- *Energy Matters* (vol. 10/2) previously reported that the [drop in the price of oil has harmed the financial strength of ISIS](#). Now it appears that without sufficient revenues, the militant group is becoming increasingly unpredictable. For instance, in Nineveh, Iraq, **ISIS militants recently set fire to five oil wells, while a nearby faction is digging pits in oil fields to use as storage wells** and constructing makeshift teapot refineries to process the crude.

Gas

- The US shipped 50 Bcf of liquid natural gas (LNG) in the first half of 2016, [a significant amount for a first-time world exporter](#). Large amounts went to South America (14.5 Bcf to Argentina, 10.9 Bcf to Chile and 6.5 Bcf to Brazil). The US moved a total of 1.05 Tcf of gas out of the country.

Coal

- The number of [coal-fired power plants under development dropped](#) from 1,090 gigawatts (GW) in January 2016 to 932 GW in July. To put that into perspective, the reduction is approximately the amount of the entire coal-generating capacity of the EU.

- [A surge in metallurgical coal prices \(up 80% in 2016\)](#) has revived some US coal companies. Note: the steel industry typically uses higher quality "met-coal."

Nuclear

- [Nuclear power plant outages](#) have been higher this summer. The high-point of operating nuclear production reached 98.31%, and the season low was 89.29%. (For a comparison, the seasonal high in

2015 was 99.93% and the low was 92.74%). Nineteen plants were taken offline at some point this summer: Alabama, Pennsylvania and Florida all had two plants go offline.

Renewables

- **Featured story:** RobecoSAM, an investment specialist focused exclusively on sustainability investing, has announced the "**top 24 companies**" for sustainability investing (one winner/sector). Visit your [American Energy Society account](#) to see the top rankings. (Note: of the 24 leaders, just two are headquartered in the US.)

- To pump oil out of the deserts of Oman, some oil and gas companies are experimenting with "**enhanced oil recovery**" - a process that uses solar energy to heat steam necessary to extract crude oil from the ground.

- **Top renewable plus hydro electricity producing states**, as a percent of the total in the first half of 2016: Iowa (48%), Vermont (44%), Kansas (39%), Oklahoma (39%), California (36%). The most underperforming states, which generate 2% or less of their electricity from renewables, are: Ohio, Missouri, Delaware, Kentucky, Tennessee, New Jersey, Rhode Island, and Sunshine State Florida.

- **Solar manufacturers are bracing for a downturn.** About 15,000 MW of new solar cell and module capacity are about to flood an already oversupplied market. That, coupled with flat or negative growth in solar installations, will start pushing prices down. Morgan Stanley says it's going to get "ugly" for manufacturers and "beneficial" for consumers.

- Maybe this time, **Massachusetts will get its offshore wind-farm**? (Its failures are well documented; see for instance the award-winning documentary, [Cape Spin](#)). About **\$11 million** has been set aside to build a staging and development farm on 26-acres just off the coast of the Commonwealth.

- **There are now 3,400 wind turbines in Scotland**, up from 1,657 in 2012. That's an increase of 1,743 – an average of more than one new turbine every day. An additional 1,547 have planning approval and are under construction.

- **Morocco is converting six hundred "green mosques"** in a national clean energy initiative. The revamp will rely on LED lighting, solar thermal water heaters and photovoltaic systems.

Policy

- **Breaking news:** Both the US Senate and the House are [investigating a handful of companies](#), including SolarCity Corp., SunEdison Inc. and NextEra Energy Inc., to determine whether they "**improperly**" benefited from **\$25 billion in federal tax incentives** provided to solar and other renewable energy firms.

- Inside the Beltway I: **Congress continues to work on a bill to rewrite federal energy policy.** Many hope this session will produce the first major overhaul of federal energy laws in a decade — but there is a long way to go to actually pass a final energy bill.

- Inside the Beltway II: **The Obama Administration is working on a few last-minute regulatory policies.** The White House and the DoE have proposed:

* **Regulations for walk-in coolers and freezers** to improve energy efficiency and reduce greenhouse gases. The industry is not aggressively opposed to these regulations. AES Premium Members have access to the true and correct copy of the proposed "[Energy Conservation Standards](#) for Walk-In Cooler and Freezers." (Note: the document is 267 pages long)

* **Greenhouse gas and [fuel efficiency regulatory standards](#) for medium- and heavy-duty engines and vehicles.** Many of the industry's largest players, like Waste Management and FedEx, support new fuel economy standards for trucks.

* New (and controversial) [efficiency standards](#) for residential gas furnaces. Unlike the other proposed rules, this one does not have broad support. The DoE admits that the new rule could drive up sulfur dioxide and mercury emissions as it reduces CO2 and NOx. Furthermore, the market for furnaces that will be regulated is quite small - about 8% of all furnaces in this country.

- As reported in *Energy Matters* (vol. 17 and 18 / 2), there is a big push in the US and Europe to regulate the emissions of the airline industry. Governments have proposed voluntary limits on airline emissions between 2021 and 2026 and mandatory limits from 2027. **The airlines would prefer a "[more ambitious](#)" timeline;** they are ready and have everything in place.

- **[Arguments about the Clean Power Plan](#) begin September 27;** but, inside the Beltway, the rumor is that this legal fight will never return to the US Supreme Court, which makes the pending lower court decision potentially binding.

Climate

- Many AES experts consider Oahu the [extinction capital of the world](#).

- India is investing Rs19,762 (\$2.95 billion) to [bring down traffic congestion](#) in its capital city, New Delhi, the world's most polluted city. If this pilot project works, the government will apply the program throughout the Indo-Gangetic plain, which stretches across northern India from eastern Pakistan on one side to Bangladesh on the other and has the [worst smog haze in the world](#).

- A magnitude 5.6 [earthquake struck Oklahoma](#) on the morning of Sept. 3 and was felt across several states. **The US EPA ordered the [closure of wastewater disposal wells](#) near the epicenter of the quake** as well as the suspension of 37 wells.

- The earth continues to warm at a rate unprecedented in the last 1,000 years. This year, [average global temperatures peaked](#) at 1.38C above levels experienced in the 19th century, just below the 1.5C limit agreed in the landmark Paris climate accord.

- **Indoor-grown [marijuana is an energy-hungry leviathan](#)** - a full one percent of the U.S. electric grid is now dedicated to growing cannabis (about the same amount of energy that is used by 1.7 million American homes). It is now the country's most energy-intensive crop. The DoE is considering a program to promote LED lighting as an alternative light/energy source.

Electricity, Utilities and Power

- Just one generation ago, utilities employed meter-readers to walk neighborhoods and read customer meters 12 times a year. Now, utilities rely on [advanced meter infrastructure](#) (AMI), which automatically reports energy usage in near real-time. It is a massive amount of data, and that does not include even more information about billing, grid operations and maintenance, system planning, SCADA systems, sensors.... **The modern utility is drowning in a deluge of data.** AES Premium Members have access to a Navigant [study](#) on utility analytics.

- **Minnesota is encouraging utilities to "[decouple](#)" energy sales from profits.** Like most other states, Minnesota used to tie a utility's revenues to total energy sold, which meant that utilities would profit when energy consumption increased. CenterPoint, a Minnesota gas-utility, is the first to test "decoupling" - so far, customers are paying slightly more than they had before the policy change, but they are using less

energy.

- Now that the world is paying more attention to global energy and power, there is new information about extraordinary amounts of “[nontechnical losses](#)” (aka, theft) among utilities/power markets in the **developing world**. AES Premium Members have access to an early [case study](#) about this problem that takes place in India during each election cycle.

- An appeals court has [upheld FERC's decision](#) to impose a **\$200 million penalty on energy companies that manipulated California's energy markets** during the 2001 energy crisis. AES Premium Members have access to the [brief](#) of the respondents.

From Basic Research to Technologies and Markets

- **Featured story:** In terms of gross population, **millennials have overtaken the baby boomers** in many countries. For instance, by 2020, they will make up 1 in 3 US adults. Though they are not anti-oil, they would rather not drive cars; the energy they consume tends to produce fewer greenhouse gases; and when (if) they vote they tend to prefer candidates who support renewable energy. [What does this demographic event mean for the energy industry?](#)

- ARPA-e has funded 475 total projects; so far, 45 have gone on to attract private capital. Some of the **most successful were for storage applications**. AES Premium Members have access to the ARPA-e "Impact" [study](#) (Note: it is 139 pages long).

- BlackRock Asset Management has urged investors to "**adapt portfolios to risk and opportunities ... related to climate change**, regardless of personal beliefs on the topic." AES Members have access to the 16-page BlackRock [report](#).

- Microsoft, NRG Energy, and the University of Texas at San Antonio (the Sustainable Energy Research Institute) have formed a **partnership to conduct research on flow batteries**, with an emphasis on easing the transition to a grid increasingly powered by renewables.

- Danish wind energy giant **DONG Energy has installed [the world's largest wind turbines](#)** at the Burbo Bank Extension offshore wind farm in England. The 8 MW wind turbines are the largest in the world - 195 meters, or larger than two Big Bens.

- This year, **90 oil and gas operators have filed for bankruptcy**. Producers and debt-holders continue to [have a sober view](#) of five-year and longer-term strategies.

— FEATURES —

Featured

NRG Energy Inc. has acquired bankrupt SunEdison Inc.'s portfolio. NRG Energy ultimately won the auction for approximately 2,100 MW of SunEdison's development stage wind and solar capacity because its initial \$144 million stalking horse bid was the highest.

NRG Energy is the biggest independent power producer in the country. To generate all that power, it burns enormous amounts of natural gas, coal and oil, making NRG one of the country's biggest polluters. It isn't trying to ruin the planet; that's just the nature of the business NRG is in: US consumers demand a *lot* of energy.

The business of providing Americans with electricity hasn't evolved much in a century. But today, growing concerns about climate change, affordable wind and solar power, and the potential for distributed

generation are pressuring utilities and power producers like NRG to adapt ... quickly.

The pressure to adapt quickly has been particularly disruptive for NRG, which has weathered more than its share of mishaps and unintended consequences. In May, for example, a fire knocked out a crucial tower at a cutting-edge but troubled solar power plant in the Southern California desert; big bets on residential solar and on a national charging network for electric vehicles were ahead of their time and fizzled; the shale and fracking booms in the US made natural gas cheap and abundant, and the transition has traded one greenhouse gas for another.

A power-hungry nation needs to change the way it is fueled, but, as the case of NRG demonstrates, transitioning to cleaner power is a difficult business. It is the *urgency to adapt to a new and evolving energy paradigm* that drove the acquisition of SunEdison's portfolio by NRG Energy - that is the real story.

Quotes

"The fundamentals of the power market have had a more significant impact on coal ... than any EPA regulation or any international climate agreement."

- Raymond Gifford, former chairman of the Colorado Public Utilities Commission.

"Coal companies still aren't investing enough in coal. The industry continues to eat itself."

- Hallador Energy Co. President and CEO Brent Bilisland

"We need to stop coal being defined as the 'problem' and make it part of 'the answer' to climate change..., specifically through support for carbon capture and sequestration technology." Colin Marshall, CEO, Powder River Basin coal producer.

"We have a moral commitment, we believe, to help some of these hard-pressed communities that are dealing with the challenges of failing coal mines so that they can have a brighter future."

- U.S. Interior Department Secretary Sally Jewell

American Energy Society, 654 Gilman Street, Palo Alto, CA 94301