

Energy Matters

The energy news you need to know.

February 19, 2019

(Every two weeks)

The official e-newsletter of ...



**AMERICAN
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SOCIETY**

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Headline News

Fossil Fuels

- **Oil: The five most productive and/or most promising offshore oil wells in the world** (Note: the legendary onshore Ghawar oilfield in Saudi Arabia holds about 70 billion barrels of remaining reserves)

1. Peroba Basin	5 billion barrels of oil	Coastal Brazil
2. Brulpadda-1	1 billion barrels of oil	Coastal South Africa
3. Nour-1	860 million barrels of oil	Egypt's Nile Delta
4. Kingsholm-1	300 million barrels	US Gulf of Mexico
5. Jethro	200 million barrels	Orinduik Block, Guyana

Gas: The US has taken command of the global LNG market; meanwhile, **US exports of ethane have increased** from nearly nothing in 2013 to an average of 260,000 barrels per day, which is about one-sixth of total US hydrocarbon gas exports. (Note: ethane is a key feedstock for petrochemical manufacturing.)

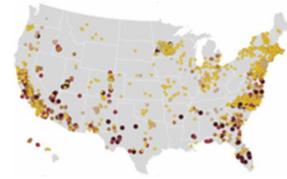
Coal: Total coal consumption in the US has declined since 2008, **but the production of refined coal has reached record highs** (refined coal has lower emissions when burned).

Carbon Capture: In 2015, the Center for Carbon Removal had an educational mission; today, **the CCR has rebranded as Carbon180 and has shifted its focus from education to economics:** "how to create an economy that sequesters more carbon than it emits?"



Low-Carbon Energy

Solar: There are about **2,500 utility-scale solar (PV) electricity generating facilities in the US**; most of these power plants are **small**, accounting for 2.5% of electricity capacity and 1.7% of total generated electricity.



Storage: In the wake of recent hurricanes, **Puerto Rico is adopting more "renewable energy + storage."** AES Premium Members have access to a true and correct copy of the draft version of Puerto Rico's 2019 Integrated Resource [Plan \(IRP\)](#).

Wind: The **7 largest wind-turbine manufacturing companies in the world:**

1. Vestas (Denmark), 13% of all turbines. (Note: Vestas is the only global energy company dedicated entirely to wind power)
2. Goldwind (China), 10% of all turbines
3. Enercon (Germany), 10%
4. Siemens (Germany), 8%
5. Sulzon Group (India), 6.3%
6. GE (U.S.), 4.9%
7. Gamesa (Spain), 4.6%

Nuclear: **South Africa is the only country in Africa that has an operating nuclear power plant.** But at least eight other sub-Saharan African states have signed agreements to build a nuclear power plant with the support of [Russia or China](#): Ethiopia, Sudan, Kenya, Uganda, Nigeria, Rwanda, Zambia and Ghana.

Renewables: China appears to be **more committed** to quickly increasing its production of energy than it is to developing renewable energy:

- Coal provides 60% of its electricity base and renewables provide 20%.
- China has set a cap on coal-fired generation at about 1,100 gigawatts, but it already relies on 1,000 GW of coal power and it has another 250 GW under construction.
- Subsidies for solar manufacturers have been reduced or cut entirely.

Energy Policy

- **DoE Secretary Rick Perry was selected as the "designated survivor" during President Trump's State of the Union address.** Sec. Perry watched the speech from an undisclosed location in the event that there was an attack on the US Capitol that killed or incapacitated the president, vice president, Speaker of the House and Cabinet members, who were all in attendance for the president's annual address. The selection of a "designated survivor," which began during the Cold War, is often the Secretary of Energy.

- The Trump administration has been under fire for not asking the EPA to regulate drinking water; however, **the EPA hasn't regulated any new contaminants in drinking water since 1996**, when Congress passed an amendment to the Safe Drinking Water Act.

- For the first time in eight years, **the US House of Representatives has scheduled a "Climate Panel" and congressional [hearings](#) about climate change.**

- **Construction of a [border wall](#) between the US and Mexico has begun** even though it cuts through and disrupts a monarch butterfly preserve. (Note: Congress approved funding for this section of the wall in last year's federal budget, before the impasse between Democrats and President Donald Trump held up another round of wall funding.)



Beltway Buzz

- The “**Green New Deal**” is not a proposed law, but rather a framework that allows Congress to discuss specifics that may later become legislation. **The resolution does not restrict or limit development of oil, gas or coal.** However, Alexandria Ocasio-Cortez (Rep, NY) was very clear that the Green New Deal would [exclude](#) nuclear power, which irritated some would-be Green New Deal supporters. Ocasio-Cortez’s office has since taken the document down from its website. (Note: nuclear power is the [largest](#) source of carbon-free electricity.) Meanwhile, Senator Mitch McConnell (R- Kentucky) plans to bring the GND to the Senate floor for a vote. What’s *really* going on? The measure is virtually guaranteed to fail in the GOP-controlled chamber, but McConnell wants to use the vote “as a way to rattle” Senate Democrats and force them to go on record.



- The House and Senate both submitted omnibus proposals that will provide moderate [increases](#) for **science-related research** for NASA, the Department of Agriculture and the National Science Foundation.

- Note: *This is a little wonky but really important* - **the DoE has issued a pre-publication proposed rule to streamline and modernize the “Process Rule.”** The proposal would significantly improve the agency’s process for setting energy efficiency standards for residential appliances. (Note: the DOE has a Congressional mandate to set America’s appliance energy efficiency standards.) AES Premium Members have access to the [proposed rule](#) (it is 177 pages long).

Policy around the world

- **Saudi Arabia and its OPEC allies are considering a formal [partnership](#) with Russia that would better manage the global oil market.**

- The Trump Administration generally supports the Saudi-led military coalition that is fighting rebels in Yemen; however, the Republican-led US Senate voted 56-41 [against](#) the White House policy and the House is expected to do the same, a reflection of public opinion. Some AES expert Members believe that **the split between Congress and the White House will push the Middle East closer to Moscow and Beijing.**

- China’s Belt and Road Initiative (BRI) is possibly the most ambitious infrastructure project in history. **Chinese banks have invested in roads, railways, bridges, ports and industrial parks, but [mostly energy](#):** 80% of all funds are going to fossil fuels -- \$54.6 billion to oil, \$43.5 billion to coal, and \$18.8 billion to natural gas, while just 3% to solar and wind and 17% to often-controversial hydro projects.



Climate and Environment

- **The magnetic North Pole is [moving faster](#),** about 9 to about 34 miles per year. The movement is not static or predictable; flows in the Earth’s core are responsible for magnetic north’s unusual behavior.

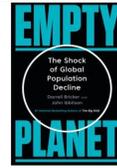
- **The color of the world’s oceans are turning bluer and greener** as a result of a warming planet, due to the growth of phytoplankton. AES Members have access to the peer-reviewed [research](#) that used instrumentation to “see” the color change.

- **Oregonians recycled 2 billion glass bottles** last year, [a per-capita world record](#). The reason is probably because Oregon doubled the payout to \$.10 per glass container.



- About 100 whales (90 belugas, 12 orcas, and 12 baby whales) are being kept in a marine containment facility (aka, a "[chain-link prison](#)") in Srednyaya Bay off the east coast of Russia. **Whales are worth a fortune on the black market** and were probably captured for sale to amusement parks in China.

- While patrolling against illegal nets and protecting the critically endangered vaquita marina porpoise, **the Sea Shepherd environmental group was [attacked](#) with rocks and partly set afire** by a flotilla of about 20 fishing boats in Mexico's Gulf of California. The patrols have drawn the ire of local fishermen because the vaquita swim bladder commands astronomical prices as a delicacy in China.



- A new book, [Empty Planet](#), argues that global over-population projections are **exaggerated**. Not like, off by a rounding error, but like totally and completely.

Electricity and Efficiency

- *Featured story:* **Residential per capita electricity demand in the US has [fallen](#) 7% since 2010**. This is an amazing statistic considering that reduced natural gas prices and declining wind and solar capital costs have caused average electricity prices to fall, which usually leads to *increased* consumption. However, gains in efficiency, building and appliance codes, industrial efficiency standards, behind-the-meter generation, and utility and third party incentives have halted load growth dramatically.

- In the next several decades, **electricity use in emerging markets is expected to rise dramatically**; from 2007 to 2035, electricity consumption is predicted to grow by 84% in non-OECD countries compared to 14% in OECD countries. Furthermore, natural gas, fuel oil, kerosene, and propane constitute the primary sources of power for heating households in the US, and only 10% supplement with electric heating in winter. **These figures are almost entirely the [opposite](#) in developing countries.**

- **Energy consumption in Asia, the Middle East, and Africa is increasing** (a 20% growth rate for each region). Of this increase, [petroleum](#) is the primary source of energy consumed, much of which has come from the Permian Basin in the US.

- A number of utilities and power companies that use the cryptocurrency exchange QuadrigaCX **lost access to \$147 million of customer revenues** when its CEO [died](#) unexpectedly, taking with him the only password able to unlock "cold storage" revenues.

- *Reviewed and recommended:* **The Institute of Public Utilities at Michigan State is offering a [Ratemaking Course](#)**, a concise and comprehensive introduction to public utility accounting, financing, and pricing. The course begins on Monday, April 8 thru Wednesday, April 10, at Michigan State University, and April 29 - May 1 at the IPU Power Grid School.



Research and Markets

- In Q3 2012, Tesla sold and delivered 321 cars; **in Q3 2018, Tesla sold and delivered 80,142 vehicles - 25,913% sales growth** in 6 years. A [comparison](#) of sales between Teslas versus German electric vehicles (EVs):

- BMW sold 34,829 EVs globally, or 14% of all Teslas sold last year (and the difference is increasing)
- VW sold about 33,000 EVs, or 13% of Tesla's total
- Audi sold almost no EVs
- Mercedes-Benz sold no EVs
- Porsche sold no EVs
- Daimler automobile sales grew 2.4%, but only a small percentage were EVs



- The US is a net exporter of natural gas for the first time in 60 years; **prices are low all over the world, except in New England and Southern California**, which have [abnormally high natural gas prices](#): the price for NG in Boston is two to three times that in New York, just 200 miles away; Los Angeles is experiencing prices 50% higher than San Francisco's. In both cases infrastructure constraints are the cause. Pipeline capacity into New England has not kept up with demand, and LA's high prices follow a catastrophic blow-out at the Aliso Canyon gas storage field in 2015 and a pipeline rupture in 2017.

- In urban settings, the space available for solar modules is minimal. One solution is the utilization of high performance quantum dots (QDs) in glass-based luminescent solar concentrators (LSCs) - aka, windows. Partially transparent LSCs provide **a simple method of energy harvesting in which sunlight is effectively redirected (through a down-conversion process) to small solar cells hidden in the [window](#)** .

- **In 2018, the US Department of Interior's Bureau of Land Management (BLM) generated \$1.1 billion from oil and gas lease sales**, an amount nearly equal to the BLM's annual budget - it was the [highest-grossing year on record](#) and triple the previous record. A total of 1,412 parcels, covering almost 1.5 million acres, were leased.

- "[Natural Gas Dynamics](#) " is an online introductory course on natural gas. (Note: there is a fee (\$129/student). *Unreviewed by AES.*

Features

Quotes - The Green New Deal

"Nuclear power has met its maker in the marketplace. We're adding no new nuclear not because of any granola-chomping protesters outside the construction site but because they're not economically viable."

- Senator Ed Markey (D-Mass), on why the GND opposes nuclear power

"We have to be a country that steps up and says 'it has to be new advanced nuclear energy.'"

- Congressman Cory Booker (D-NJ), who supports the GND and nuclear power.

"Everybody wants to get to the same goal."

- New York Gov. Cuomo and apparent support among Democrats for the proposed GND

"I've noted with great interest the Green New Deal. We're going to be voting on that in the Senate. Give everybody an opportunity to go on record."

- Senator Mitch McConnell (R-Kentucky), on using the GND as a political weapon in 2020

"The Green New Deal sounds like a high school term paper that got a low mark - it will take away your car, take away your airplane flights."

- President Donald Trump criticizing the GND again.

What You May Have Missed

- Solar: Since 1975, the cost of photovoltaic solar panels has [declined](#) by roughly 99%, not with a single breakthrough, but with small improvements over time:

- Scientists have made incremental advances in the efficiency of the panels.
- Manufacturers found ways to use less silicon per panel.
- Solar factories got larger and cut costs through automation.

Contacts

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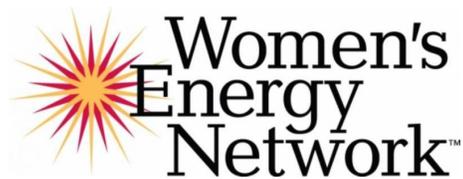
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