

Energy Matters

The energy news you need to know.

July 15, 2019

(Irregular publication schedule in July)

The official e-newsletter of ...



**AMERICAN
ENERGY
SOCIETY**

News from the Society

- AES is co-hosting [CyberCon](#), a solutions-oriented **cybersecurity conference for executives and decision makers in the power and utility industry**, on November 19 – 21, 2019 at the Anaheim Convention Center in California. [Contact us](#) for special registration pricing for AES members or other questions.

- It has been a very busy week in energy (British warships in Iran; Chevron oil spill in California; a good day for storage; a bad day for bees...). **Visit the [AES website for Daily Dose](#) updates on the energy news you need to know.**

- In case you missed it: [Energy Today](#) (vol. 11.3), "The Summer Reads" issue.

- *Thank you for your Premium Membership!* Share this issue with colleagues and encourage them to **join the Society**

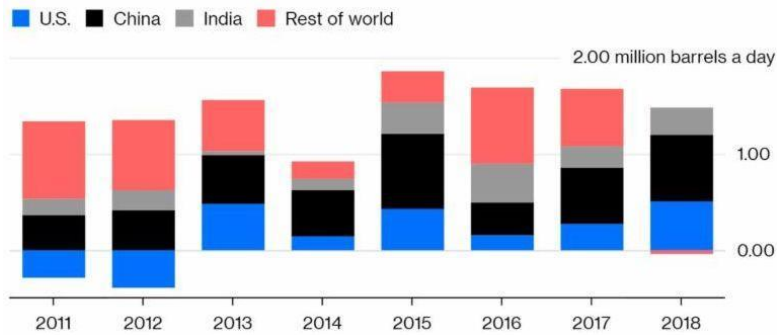
- [Premium Membership](#) is only **\$17/year**
- [Basic Membership](#) is still **free**.

Headline News

Fossil Fuels

Oil: The global petroleum market sets a number of records, a snapshot:

- [Oil supply](#). For the first time ever, US crude oil production surpassed 12 million barrels per day, less than a year after it surpassed a record 11 million b/d in August 2018. Texas, Offshore Gulf of Mexico, and Oklahoma have reached all-time record production levels.
- [Oil demand](#). Meanwhile, China, India, and the US accounted for all the growth in global oil demand last year, while the rest of the world reduced oil consumption.

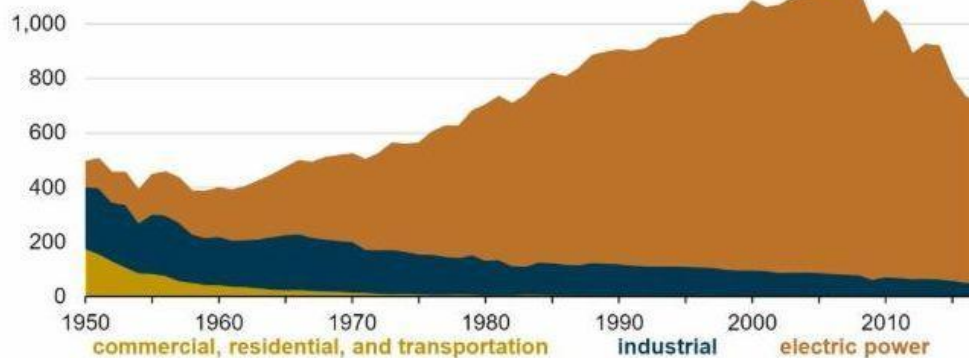


Gas: [Last year](#), 90% of all natural gas used in the US was produced domestically, and natural gas production exceeded consumption for the first time since 1966.

Meanwhile, it's been a **bad few weeks for Nord Stream** (the offshore natural gas pipeline between Russia and Germany and owned by Russia's Gazprom):

- The US is considering controversial sanctions on any trade involving Nord Stream.
- Most of the Nord Stream region remains entirely [unprotected](#) - neither Russia nor Germany patrol the region while Denmark, Norway, Sweden, and Poland have invested nothing in its security even though drones and trespassers are [frequent](#).
- The entire Nord Stream pipeline will be [closed](#) for 2 weeks for repairs.

Coal: [US coal consumption, by sector](#) (Note: in the 1950s, three sectors consumed nearly equal amounts of coal; today, the electric power sector consumes 93% of the total):



Carbon Capture: The European Commission has launched a new program to [fund](#) carbon capture projects that cut emissions in heavy industries such as cement, steel and petrochemicals.

Low-Carbon Energy

Geothermal: [Hydraulic fracturing](#) and horizontal drilling technologies developed by the oil and gas sector are being **applied to geothermal, allowing improved access to higher temperatures and pressures**. (Note: the heat and pressure is used to power electricity generation).

Wind (offshore): Testing of the [Hywind offshore turbines](#) along Scotland's Aberdeenshire coast has been completed and now the Danish energy-trading firm Danske Commodities is buying its power. Meanwhile, **Denmark's Ørsted will build Ocean Wind, New Jersey's first offshore wind farm**. Construction begins in 2020 and finishes in 2024.

Solar (concentrated): The cost of concentrated solar power ([CSP](#)) is competitive again - it declined 26% in the last year and 46% since 2010. Related, CSP deployment is increasing in China. (Note: the price of CSP ranges from \$60 to \$100 per megawatt-hour, or almost the same as offshore wind.)

Hydrogen: According to [a new report](#), hydrogen has enormous potential as a source or bridge fuel; however, a few **obstacles are slowing adoption and deployment**:

- Producing hydrogen from low-carbon energy is costly at the moment.

- The development of hydrogen infrastructure is slow.
 - Hydrogen is almost entirely supplied from natural gas and coal today.
 - Existing regulations currently limit the development of a clean hydrogen industry.
- AES Premium Members have access to a [special report](#) on hydrogen.

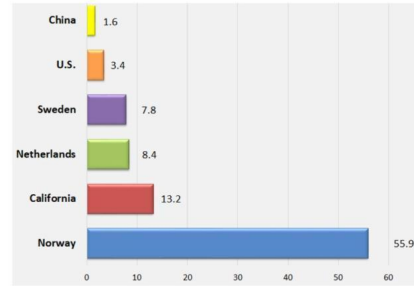
Nuclear: "Project Dilithium" - The US military is looking for **developers of small nuclear reactors** that can be used by forward bases in remote regions (like Iraq, Afghanistan, etc). The DoD is looking to fund three different prototype designs. (Note: In 2008, during the height of combat in Iraq, about 900,000 gallons of fuel was used to power lighting and refrigeration (that does not include the 6.7 million gallons used by US military jets and ground vehicles.) *Requirements of the small modular reactor:*

- Fit on a truck and a C-17 aircraft.
- Generate 1-10 megawatts of power for three years without refueling.
- Can be up and running in 72 hours and taken down in a week.
- Meltdown-proof.

(Note: In *Star Trek*, [dilithium](#) is an invented material which serves as a controlling agent in the faster-than-light warp drive.)

- **EV market share in Norway**, by per capita adoption, five year intervals (insert):

- 2008: 0.22%
- 2013: 5.89%
- 2018: 46.42%



Policy

- Once the EPA finalizes President Trump's Affordable Clean Energy (ACE) rule, which replaces President Obama's Clean Power Plan, about one in five coal-fired power plants in the US will be allowed to [increase](#) carbon emissions. **Allowable CO₂, SO₂, and/or NO_x emissions as per ACE**, by state:



Beltway Buzz

- [Atlantic Richfield v. Christian](#). **At issue in the controversial US Supreme Court case is who has jurisdiction over Superfund sites.** The EPA has been overseeing the cleanup of the Anaconda Copper Mine Superfund Site in Montana since 1983. Soil, groundwater and surface waters around the old mine contain arsenic and other hazardous substances. Land-owners and neighbors who live nearby accuse the EPA of dragging its feet and are pursuing their own course of action with other federal and state agencies and private firms to take over restoration work beyond what the EPA has so far achieved.

- *Recommended resource:* The [OurEnergyLibrary](#) aggregates and indexes publicly available fact sheets, journal articles, reports, studies, and other publications on US energy topics. It is updated every week to include the most recent energy resources from academia, government, industry, non-profits, think tanks, and trade associations.

Policy around the world

- **India has ceased its oil trade with Iran.** Throughout 2018, Iran sold 620,000 barrels of oil per day to India, worth almost \$48 million; meanwhile, Iran relied on India for gasoline because it had limited refining capabilities. The terms were more favorable to both than those offered by any other nation. Trade was continuing in 2019 until [May 23 when India stopped its oil trade with Iran](#). Current India Ambassador to the US, Harsh Vardhan Shringla: "We understand that US trade sanctions are a priority for the US administration. But it comes at a cost to us."

- **Australia is experiencing an energy crisis** so severe that its Federal Parliament is relaxing natural gas [import rules](#) even though the country is the third biggest exporter of liquefied natural gas.

Climate and Sustainability

- *Featured story I:* Google Street View cars travel public roads to build accurate and comprehensive web-based maps. While driving around fertilizer plants in Kansas, Nevada and Oklahoma, the Googlers smelled strange "fugitive emissions" that had carried downwind. They attached gas sensors to the cars and started collecting air quality measurements around the facilities. **The team discovered that the fertilizer plants were emitting significant amounts of natural gas.** Scaling their data, it appears that the fertilizer industry in these regions have annual fugitive methane emissions of 29,000 metric tons per year - more than 100 times the fertilizer industry's self-reported estimate of 200 metric tons, and far more than the EPA's estimate for the entire US fertilizer industrial sector. AES Premium Members have access to the non-peer-reviewed [paper](#).

- *Featured story II.* **The Taylor Energy oil-production platform in the Gulf of Mexico has been leaking since 2004.** The company says three gallons of oil are being released into the Gulf each day; however, NOAA and Florida State scientists have determined that about 108 barrels of oil are leaking each day. AES Members have access to the NOAA [report](#).

- *Featured resource:* **The United Nations Sustainable Development Solutions Network has published its comprehensive "US Cities Report."** *Summary:* None of the major metropolitan regions in the US are on track to meet the UN's Sustainable Development Goals. The 3 most sustainable regions in the US, and the least:

1. San Francisco-Oakland-Hayward, California
2. San Jose-Sunnyvale-Santa Clara, California
3. Washington-Arlington-Alexandria, Washington, DC

Last: Jackson, Mississippi

- **Spotlight Mississippi, a bad week...**

- Heavy snow in the winter and rain in the spring throughout the Midwest is causing horrific flooding in Mississippi this summer.
- All 21 of Mississippi's Gulf Coast beaches have been closed as an expanding bloom of toxic blue-green algae covers the state's waters (*insert*).
- Runoff from farms along the Mississippi River has contributed to one of the world's worst ecological disasters. AES recommends the interactive graphic that maps the harm to the [Mississippi River](#).



- **The Summer of 2019 heat wave:**

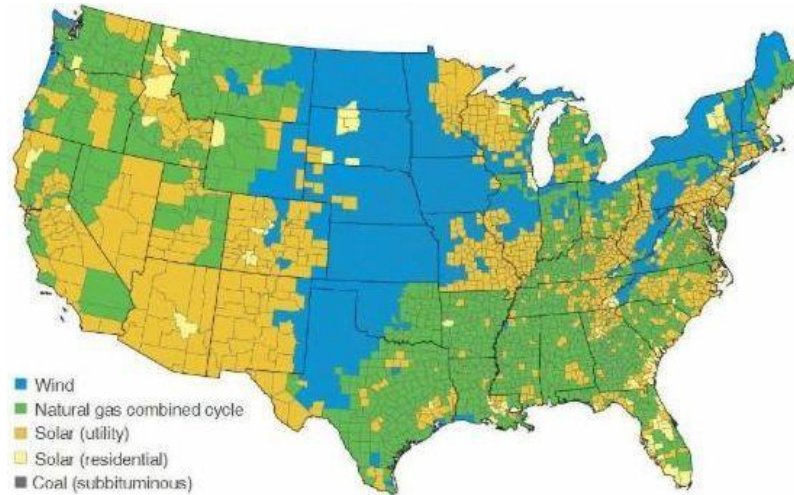
- France: 45.9 degrees Celsius or nearly 115 degrees Fahrenheit (a record high)
 - Alaska: 85 degrees (a record high, several consecutive days)
 - Greenland: 40 degrees above normal.
 - And here comes a season of hurricanes, starting with Barry, the eye of which is aimed at ... Mississippi.
-

Electricity, Power and Efficiency

- [Demand charges](#) (electricity fees paid by customers based on their highest usage in any 15-minute interval of the billing period) are being re-instituted by **utilities trying to generate more revenues from customers who install solar**.

- Recommended resource: [Cross-border electricity infrastructure in Europe](#) (an interactive map), by the European Union.

- **The least expensive method for generating electricity in the US**, by region:



Cyber-Security Threat Post

- **The US has deployed American code into Russia's electric power grid** in an offensive demonstration of its willingness to defend itself from cyber-attack. Advocates of the more aggressive strategy said it was long overdue after years of public warnings from the Department of Homeland Security and the FBI that Russia has inserted malware that sabotaged American power plants, oil and gas pipelines, and water supplies. But the new strategy carries significant risk of escalating the digital Cold War between Washington and Moscow.

Research and Markets

- The structures of individual molecules in crude oil is so complex it is extremely difficult to separate crude oil into individual compounds or interpret their structure. In a recent study, **scientists reported a new approach to oil composition analysis** using high temperature and pressure to dissolve crude oil in water. The strategy conforms to green chemistry standards as it obviates the requirement for naturally dangerous solvents. AES Premium Members have [access](#) to this report.

- New research suggests that **increasing the world's forest land** by a third (the size of the US or Brazil) could store 205 billion tons of carbon (or 2/3rds of the excess carbon in the atmosphere). AES Members have access to the peer-reviewed [research](#).

- The US DoE and NREL are seeking teams for Round 2 of the American-Made Solar Prize, a \$3 million competition focused on [new technologies](#) to improve the solar market.

- Saudi Arabia's King Salman bin Abdulaziz Al-Saud has committed \$500 billion (USD) to develop **Neom**, a futuristic city between Saudi Arabia, Egypt and Jordan. A key feature of this mega-economic zone will be the deployment of cutting-edge smart city technologies. AES Members in the "smart-city" space should [contact AES](#) to learn more about Neom and its opportunities.

- Initial public offerings are hot right now in the US, but **not for clean energy**. Rumor is that only two companies are considering an IPO: fuel-cell specialist Bloom Energy and Sunnova, a Houston-based residential solar and storage provider.

- Recommended [resource](#): "**Advancing the Landscape of Clean Energy Innovation**," by Breakthrough Energy.

Features

Spotlight: The Competitive Enterprise Institute

The CEI is a research organization in Washington, DC, that disputes that climate change is a problem. The institute recently hosted a Game of Thrones-themed gala. Sponsors included the Charles Koch Institute, the American Fuel and Petrochemical Manufacturers, and Myron Ebell, who led the Trump administration's transition team at the EPA and spearheaded White House opposition to the Paris Agreement. Other sponsors included major corporations, like Google and Amazon, that have made addressing climate change a key part of their corporate public relations strategies. Amazon gave a \$15,000 contribution to the event because CEI "helps advance policy objectives aligned with our interests." AES Members have access to the [event program](#).

Quotes: California vs. President Trump -- the auto-emissions controversy

The background: EPA Administrator Andrew Wheeler and California Air Resources Board Chair Mary Nichols are leading conversations about California's Clean Air Act waiver, which allows the state to set its own (higher than federal) emission limits. As per White House instruction, the EPA wants California to adopt the nation's more relaxed emission limits. Rather than compromise, however, 23 other states and Puerto Rico recently agreed to abide by California's standards rather than the nation's.

"Mary Nichols is a 'bad faith' negotiator." - EPA Administrator Andrew Wheeler, claiming Nichols recruited allies and split the nation

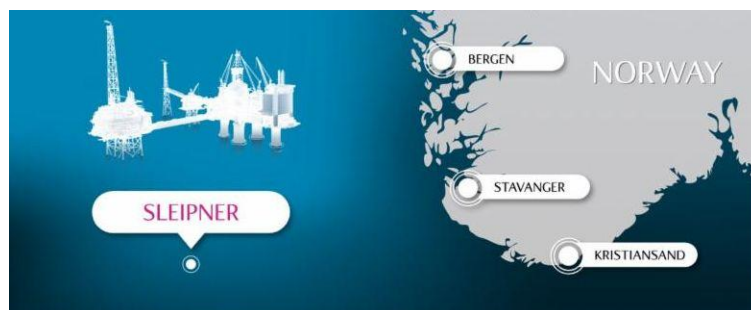
"I'm shocked." - CARB Chair Mary Nichols, responding to Wheeler's accusation, noting that the states acted on their own volition

"This sounds like 'he said, she said.'" - Rep. John Shimkus (R-Ill.)

"I'm really not interested in a pissing contest between California and this administration, to be perfectly blunt." - Rep. Debbie Dingell (D-Mich.)

In case you missed it - Energy Matters, vol. 13.6

- [Carbon capture](#), *featured resource*. Since 1996, the Sleipner field in the North Sea has been used for carbon capture and storage. This is the longest ongoing CO2 storage project in the world with about 1 million tons of CO2 captured and stored each year. The scope and scale of CO2 capture and storage in Sleipner provides unique insight into what happens when carbon is stored underground over a long period of time. The operators of the field have taken the unprecedented step of releasing the data. **Please contact AES if you are a Premium Member and would like exclusive access to this privileged data set** when it is released next month.



- **Start-up CleanTech Pitch-fest at [ConFusion](#), Skelleftea, Sweden** . For an introduction to any of the participants, please **contact AES**. (Note: the winning pitch: **Smart Climate** - environmentally friendly heating and cooling units for parked commercial aircraft.

Contacts

- [The American Energy Society](#)
- American Energy Society [LinkedIn Group](#)
- American Energy Society introductory [video](#)
- [Contact us](#) with comments about the Society or this issue of *Energy Matters*.

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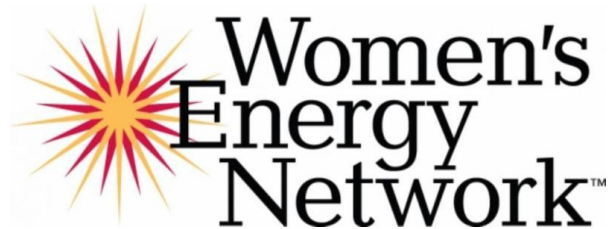
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