

# Energy Matters

*The energy news you need to know.*

**March 18, 2019**

*(Every two weeks)*

The official e-newsletter of ...



**AMERICAN  
ENERGY  
SOCIETY**

*Thank you for your Premium Membership in the American Energy Society.*

## **AES Updates**

**- AES recommends:**

- [POWER Conference](#) on Energy Research and Policy, UC Berkeley, March 22.
- [CMU Energy Week 2019](#) is March 25-28.
- MIT 2019 Energy Conference: [Tough Tech & The 2040 Grid](#), April 4 and 5 at the Boston Marriott, Cambridge.
- Generous research opportunities ... [in Europe](#).
- [Energy ConFusion, in Skellefteå Sweden](#) on June 3-5. Contact AES if interested.

**- Please share this issue with colleagues and encourage them to [join the Society](#) :**

- [Premium Membership is still \\$17/year](#)
- [Lifetime Membership is only \\$99](#) (a one-time fee)
- Basic Membership is [free](#).

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## **Headline News**

### ***Fossil Fuels***

**Oil: The Permian Basin (considered by many the most productive hydrocarbon region in the world), by the numbers:**

- In [2018](#), the Basin produced more than 3.7 million barrels of oil per day.
- In 2017, the region produced about 2.7 million bpd.
- In 2016, it produced about 1.7 million bpd.
- Oil has been extracted from the Permian Basin for nearly [100 consecutive years](#).
- The Permian produces [20%](#) of the lower 48's total, and 68% of Texas total.

- The [top 3 producers](#) in the Permian:
  1. Pioneer Natural Resources 59,359,738
  2. Occidental 42,697,587
  3. Apache 30,098,087



**Gas:** For the second year in a row, the US [exported](#) more natural gas than it imported. *Note:* The Permian produces about 4 billion cubic feet of natural gas per day.

- AES Members have access to a [summary](#) of the 2019 IEA Oil Forecast.

- Stanford University is offering two *free* online [Unconventional Geomechanics](#) courses - both start April 1.



**Coal:** The [first](#) coal-fired power plant to open in the US since 2015 is at the University of Alaska, Fairbanks. The University has no access to oil or natural gas pipelines, the region is not particularly windy, and it's dark most of the year ... but it is near the state's only coal seam.



- The 847-megawatt coal-fired San Juan Generating Station in New Mexico is for sale. The price tag? [\\$1](#)



**Carbon Capture:** The [USE IT Act](#) is being reintroduced in the Senate with bipartisan support. If passed, it will streamline the [carbon dioxide pipelines permitting process](#) and modify the [48A tax credit](#) to encourage more carbon capture at coal facilities.

## Low-Carbon Energy

- *Featured story - P2G.* Hydrogen as a source of power has many advantages. For instance, the gas has enormous energy density and there are multiple ways it can be captured, isolated, or created. The problem is that hydrogen is an extremely expensive fuel source. However, **a hydrogen P2G facility may now be economical when combined with renewable energy, especially wind or solar.** AES is pleased to provide Premium Members with access to the exclusive peer-reviewed [study](#). (If unable to view the article, please see the [abstract](#).)

**Solar:** Researchers have created a solar panel that uses sunlight to make hydrogen from the moisture in the air. The amount of hydrogen produced was minuscule in the first demonstrations, but the process now produces [larger quantities](#). (Note: The panels are not economical ... yet.)

**Storage:** The [top energy storage countries](#) ... *it depends:*

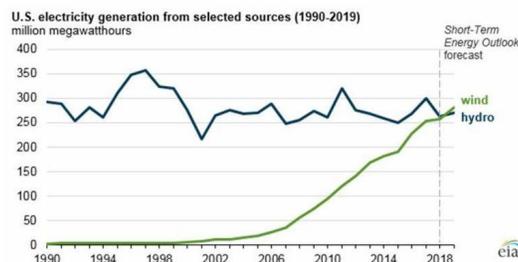
- Based on total storage, Australia stores the most amount of energy at any given time (246 megawatts) - Tesla's record-setting Hornsdale project plays a pivotal role.
- Based on capacity, the US can store up to 431 megawatt-hours (Australia is second, followed by Germany, China and Japan).
- Canada, the UK, South Korea and India also have significant totals and capacity.

Spotlight, [Wind power in 2018, by the numbers:](#)

- The wind industry installed 51.3 GW of new capacity in 2018, a decrease of 3.6% compared to 2017.
- Onshore wind capacity fell 3.9% in 2018, compared to 2017.
- Offshore wind capacity grew 0.5% in 2018.



- Related, **wind power just passed hydroelectric power as the [most](#) prominent source of renewable energy in the US** (thank you AES expert Member, [Matt Chester](#)).



# Energy Policy

## Beltway Buzz

- **Featured story: The US Supreme Court calendar is filled with cases related to energy and the environment.** So far, the justices have decided only one - a November ruling that remanded a case involving the Endangered Species Act to a lower court. What makes the upcoming session compelling is the uncertainty surrounding Justice Kavanaugh, who will break the 4-4 split between sympathetic and skeptical judges. Most of the upcoming cases involve questions about federalism (disputes between states and the federal government and its agencies) and environmental regulation. **The [AES website](#) summarizes all the upcoming cases and links to SCOTUS briefs.**

- The White House has submitted to the EPA its proposed rule that would expand the mandate of 15% ethanol blended in gasoline from six months (during winter) to year-round sale. If the White House commits by the end of March, it will be in time for the summer driving season. **AES Members have access to the [EPA proposal](#) .**

- The White House disagrees with the US Congress (both parties) on how much of the nation's budget should support energy-related research. Thus far, Congress has rebuffed the administration's attempts to scale back funding of energy-related RD&D and have increased energy budgets. **The White House has resubmitted a series of proposed cuts:**

- A 12% cut in the National Science Foundation budget.
- Large cuts for many DoE programs, including the basic sciences as well as the elimination of the Advanced Research Projects Agency–Energy (ARPA-E).
- A 2.3% reduction for NASA, though the lunar exploration program would increase.
- USDA competitive grants would see a sizable boost of 20% (to \$500 million) but all other research programs would be cut back.
- All energy-related education programs (NASA, NOAA, DoE, etc.) would be eliminated entirely.

- **The Trump administration has said that it will [not negotiate](#) with California and will roll back Obama-era fuel efficiency standards. California is preparing to sue.**

## Policy around the world

- **As a result of US sanctions**, Citgo and Valero Energy are trying to [return](#) 2 million barrels of crude to Venezuela that were loaded before US sanctions went into effect; Chevron is trying to buy the 4.3 million barrels that are currently loaded and en route.

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## Climate and Environment

- **Climate-themed documentaries receiving acclaim at the [D.C. Film Festival](#) :**

- [Thirst for Power](#) - a documentary on water-energy conflict.
- [Hostile Planet](#) - a six part series by National Geographic; *the images in the 1.5 minute [YouTube](#) trailer are spectacular.*
- [Epic Yellowstone](#), by the National Museum of Natural History.
- [Cooked: Survival by Zip Code](#), produced and directed by E Street Cinema.
- [The Green Lie](#), a German documentary, by the Carnegie Institution for Science.

- **Featured story:** "[Yang Laji](#)" noun (Chinese philosophy). Formal definition: the active male principle of the universe. Mandarin slang: "foreign garbage." In response to the US/Chinese trade war, China has banned the import of all recycling items from the US and has formally established with the World Trade Organization that **it will no longer be the end point for yang laji, or foreign garbage.** Consequently, many American domestic landfill sites are overflowing and are burning massive amounts of garbage, which releases toxic pollution. For instance, every day about 200 tons of recycling material is being sent to the huge Covanta incinerator in Philadelphia; the facility is struggling to burn so much trash.

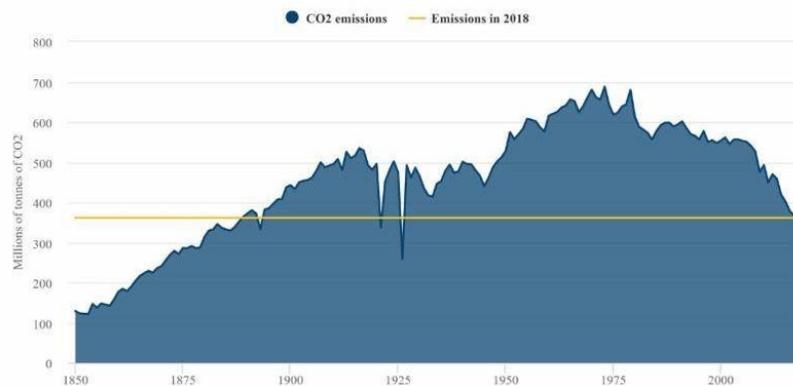


- **The "#trashtag" challenge by Facebook is calling on "bored teens" to pick up garbage in public spaces.** The post, which features a "before" image of a man surrounded by trash and an "after" image of the man in the same area with the trash bagged up.



- Cyclone Idai (and flooding) [cut off power](#) in parts of Mozambique and Zaire.

- In 2018, CO2 emissions in the UK [fell](#) for the sixth consecutive year and have reached the lowest levels since 1888.



- Researchers are studying how [solar geoengineering](#) - dispersing tiny particles into the upper atmosphere - can reflect incoming solar radiation and offset global warming. There is concern about unintended consequences of geoengineering, such as potentially causing drought.

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## Electricity and Efficiency

- A private developer (DC DevCo) has proposed a 349-mile, 2.1 GW, high voltage direct current (HVDC) [transmission line that will connect wind-power sites in Iowa to the PJM \(Atlantic coast\) and MISO \(Chicago\) wholesale power markets](#) - the two largest markets in the US. The project will cost \$2.5 billion and could be operational by 2024. To bypass the permitting process, DevCo proposes to bore the lines underground and alongside existing railroad tracks rather than build overhead transmission lines that upset ecologically sensitive areas.



- **Alabama Power charges customers \$5 per kilowatt per month if they have rooftop solar panels and are still connected to the power grid. This is the [highest](#) tax-rate on rooftop solar in the country.**

- **Transmission is a desperate issue.** FERC is planning to refocus on the 40,000 pages of complicated applications on its queue. AES Members have access to the FERC upcoming [agenda](#).

- **[Request for Proposal \(RFP\)](#): provide training** on national load flow modeling, advanced contingency analyses, and reactive power for Burundi's utility REGIDESO, the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) and the Eastern Africa Power Pool (EAPP). Questions due by March 19; applications due April 2.

## Cyber-security

- A comparison of the 2019 Venezuela and 2017 Triton cyber-attacks:

- **Most of Venezuela is still without power due to the shutdown of Guri Dam** (formerly the Simón Bolívar Hydroelectric Plant, and before that the Central Hidroeléctrica Raúl Leoni). It is the fourth largest hydroelectric complex in the world. Typically, a cyberattack directed at a hydro-electric power-plant tries to harm the computer system that operates the dam. However, AES expert Members generally agree: "[knowing Venezuela](#), it was likely an internal failure." And another: "it is politically expedient for current Venezuela leaders to blame an external cyber-attack, though no evidence confirms it."
- **The Triton cyberattack that shut down a Saudi Arabia petrochemical plant in 2017 was [more widespread and more damaging](#) than reported.** The initial phase of the attack took place three months before the full-scale assault, and then the attack shut down plant operations for about one week, cost the company hundreds of millions of dollars, and released toxic hydrogen sulfide gases into the atmosphere. (Note: The bad-actors were probably located somewhere in Russia.)

## Research and Markets

### - [BP 2019 Energy Outlook](#) , a summary:

- By 2040, the world will consume between 80 million barrels per day (low-end) to 130 million bpd (high-end). *Editor's note:* history has shown how hard it is for societies to move from one form of power to another - typically about four or five decades.
- Renewables have penetrated the global energy system faster than any fuel in history, from 1% to 10% in just 15 years.
- Overall, global energy demand will grow by around a third by 2040, slower than the previous 20 years but still enough to make it difficult to lower greenhouse gas emissions as needed.
- Around 80% of future demand will come from the developing world; yet, the developing world will consume significantly less energy than the developed world (2/3rds of the population uses less than 1/3 of its energy).

### - [Best funded](#) autonomous vehicle companies to date:

- |                     |                      |
|---------------------|----------------------|
| 1. Zoox             | 5. Cyngyn            |
| 2. Nauto            | 6. Pony.ai           |
| 3. Velodyne LiDAR   | 7. Aurora Innovation |
| 4. Quanergy Systems | 8. Drive.ai          |

### - The [top-12](#) venture capital firms investing in cleantech, by number of deals

- |                           |                                 |
|---------------------------|---------------------------------|
| 1. Kleiner Perkins (99)   | T-7. VantagePoint (33)          |
| 2. Khosla Ventures (70)   | T-7. RockPort Capital (33)      |
| T-3. NEA (56)             | T-7. Foundation Capital (33)    |
| T-3. DFJ (56)             | T-7. Clean Energy Ventures (33) |
| 5. E8 (47)                | 11. DBL Partners (30)           |
| 6. Investors' Circle (34) | 12. Applied Ventures (29)       |

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## [Features](#)

### Quotes - More in common than we think

"All the climate arguments are real, urgent and important. The longer we wait to make changes, the more 'draconian' the changes will have to be."

- Spencer Dale, Chief Economist for BP.

"Climate change is a man-made problem that requires a feminist solution."

- The tag-line for "[Mothers of Invention](#)", a new podcast that address any issue related to climate change

"It (the US Department of Interior) has been badly neglected for far too long. And when its leaders aren't seeking ethics counsel, why should anyone else?"

- David Bernhardt, President Trump's pick to replace Ryan Zinke and lead the US Dept. of the Interior.

"While this is not the finest hour for EPA, the EPA was always bad on drinking water."

- Ronnie Levin, former EPA staffer, current head of water and health at Harvard

### What you may have missed

- See the [AES website](#) for a summary of all upcoming SCOTUS cases (and links to briefs) related to energy and the environment.

## 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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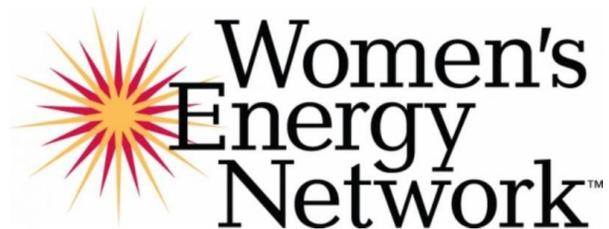
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