

Energy Matters

Trusted soundbite summaries of the energy news you need to know.

March 16, 2020.

An official publication of



Thank you for your Basic Membership in the American Energy Society. Please share this newsletter with colleagues and encourage them to [join](#).

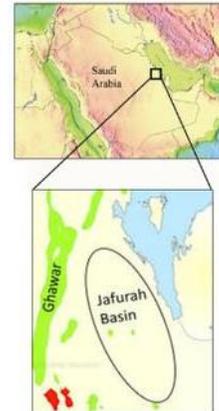
Editor's Note: Coronavirus and energy update...

- *Oil:* Due to the COVID-19 outbreak, Barclays projects that global oil consumption will decline by approximately 200,000 bpd; International Energy Agency (IEA) revised its projected oil consumption downward by 365,000 bpd.
- *Solar:* Developers waiting for module delivery from mainland China in April will not see the orders delivered on time; solar project construction schedules with Q3 and Q4 2020 placed-in-service dates will also be hit particularly hard.
- *Wind:* Supply of key components such as turbine blades and main bearings have already been reduced by about 15%+.
- *Battery storage:* China's production capacity of battery-storage components has already dropped 10%.
- *Energy-tech:* Investors at Sequoia Ventures warned start-ups seeking seed capital that the current epidemic might have "black swan" potential.
- *Sustainability:* Welcome to first true test of the corporate purpose movement. After more than a year of corporations looking beyond revenues, efforts to improve everything from sustainability to environmental standards to satisfy more stakeholders could be in jeopardy. With business flailing, energy companies from generation to transmission to retail are focused on keeping operations going.

For more insights into the impact of the coronavirus on the energy sector, see the most recent issue of [Energy Today](#) as well as the [AES newsfeed](#).

Fossil Fuels

Oil: The uneasy alliance between the Saudis and Russians has broken down, and now [oil prices](#) are racing to the bottom (i.e. 22% decline on March 9). Saudi Arabia increased production (thereby cutting prices) because Russia refused to restrict how much oil it would produce; Russia, on the other hand, is upset because the Saudi's are asking OPEC+ for production cuts yet gave Aramco the go-ahead to begin production in the [Jafurah shale gas field](#).



Natural Gas: [There are currently 88 proposed gas-fired generation projects in the US.](#) (construction has not yet begun) totaling 68 GW of capacity. Visit the [AES website](#) for a map of project locations.

Coal: Globally, power from [coal plants](#) fell by 3% last year, though China increased its reliance on coal plants and now consumes half the world's coal.

Carbon Capture: [The oceans contain more carbon than soil, plants, animals and the atmosphere combined.](#) The ocean "carbon pool" was created naturally over millions of years. AES Premium Members have access to [peer-reviewed](#) research that explores the possibility of artificially accelerating carbon sequestration in oceans.

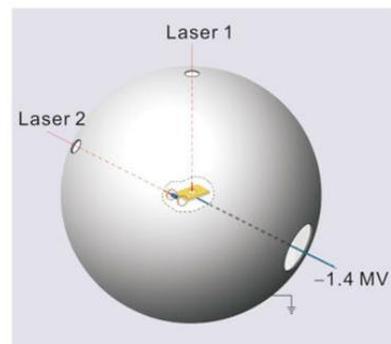
Low-Carbon Energy

[Wind](#) surpassed hydro as the most-used renewable energy source in the US.

There are two giant "pumped storage" [hydropower](#) plants just outside of Joshua Tree National Park in California - originally, both were mines that had been abandoned.

[Biofuel](#) consumption in the US has gradually increased each year since 2010. Higher global crude oil prices usually lead to increased consumption of biofuels (such as fuel ethanol and biodiesel) as substitutes for petroleum products; lower crude prices tend to reduce biofuel consumption.

[Fusion](#) has always been 20 years away from being 20 years away. Yet, both Max Planck Institute's Wendelstein 7-X stellarator and the ITER Tokamak projects continue to work on deuterium-tritium thermonuclear fusion - which requires temperatures hotter than the surface of the Sun, at up to 15 million degrees Celsius (27 million degrees F). "HB11" takes a simpler approach: an empty metal sphere filled with fuel pellets are targeted with lasers that trigger an 'avalanche' fusion chain reaction.



Policy

Beltway buzz: Senate Energy Chair Lisa Murkowski and ranking Democrat Joe Manchin introduced energy legislation that appeared ready for passage; however, at the last minute **the Senate voted against the bill because it did not phase out hydrofluorocarbons (HFCs)**. *Editor's note:* FreedomWorks lobbying group sent a letter to Senate leaders *opposing* the HFC phasedown; however, they previously sent a letter *supporting* an HFC phasedown. In other words, FreedomWorks was **FOR** the HFC phasedown before they were **AGAINST** it.

President Donald Trump's **2020 budget proposal to Congress includes [complete elimination](#) of ARPA-E** (the agency focused on researching and developing future energy technology) and a 70% reduction of funding for the Office of Energy Efficiency and Renewable Energy (EERE).

The DoE **[suspended its planned sale of crude oil](#) from the Strategic Petroleum Reserve**. Oil price declines of up to 30% were precipitated by concerns that the coronavirus would tamp down demand and after Saudi Arabia and Russia failed to reach a deal to cut their oil production. (Note: The DoE sold about 10 million barrels in the fall of 2019, which increased supply and kept prices down.)

States and districts with **[100% commitments](#)** to clean energy power grids, by year:

Washington, D.C. (by 2032)
New York (2040)

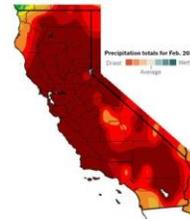
Hawaii (by 2045)
California (2045)
Washington (2045)
New Mexico (2045)

Maine (by 2050)
Puerto Rico (2050)
Nevada (2050)

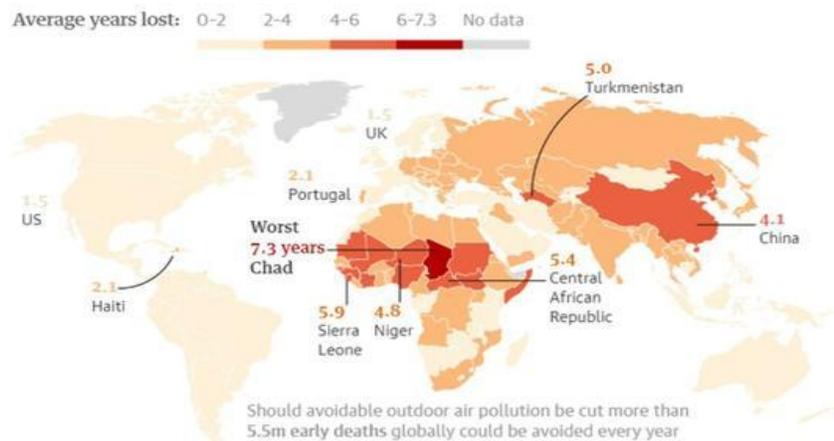
Climate and Sustainability

It appears that **the rate of carbon processed by photosynthesis is estimated to have risen by about 30% since 1900**, but the causes for this increase are not well known. According to peer-reviewed research, it is possible that rising atmospheric CO₂ concentration is the dominant driver. AES Premium Members have access to the research on [CO₂](#) photosynthesis rates.

California had its driest February on record. Ordinarily, 90% of California's rain falls during the seven-month period between Oct. 1 and April 30, with half of the state's total precipitation falling during December, January and February.



Globally, **2.9 years of life expectancy on average are lost due to outdoor air pollution** - a bigger toll than tobacco smoking (*insert*).



Research and Markets

Due to the oil-price wars, [gas prices will probably drop](#) about 25¢/gallon.

Researchers have demonstrated that **they can overcome a persistent challenge known as "dendrites" to create a battery that performs nearly as well as a lithium-ion battery** but relies on potassium—a much more abundant and less expensive element. AES Premium Members have access to the [peer-reviewed research](#). **The Chinese airline industry collapsed**, dropping from about 13,000 flights/day, to less than 2,000. The air travel slowdown has spread to other countries.

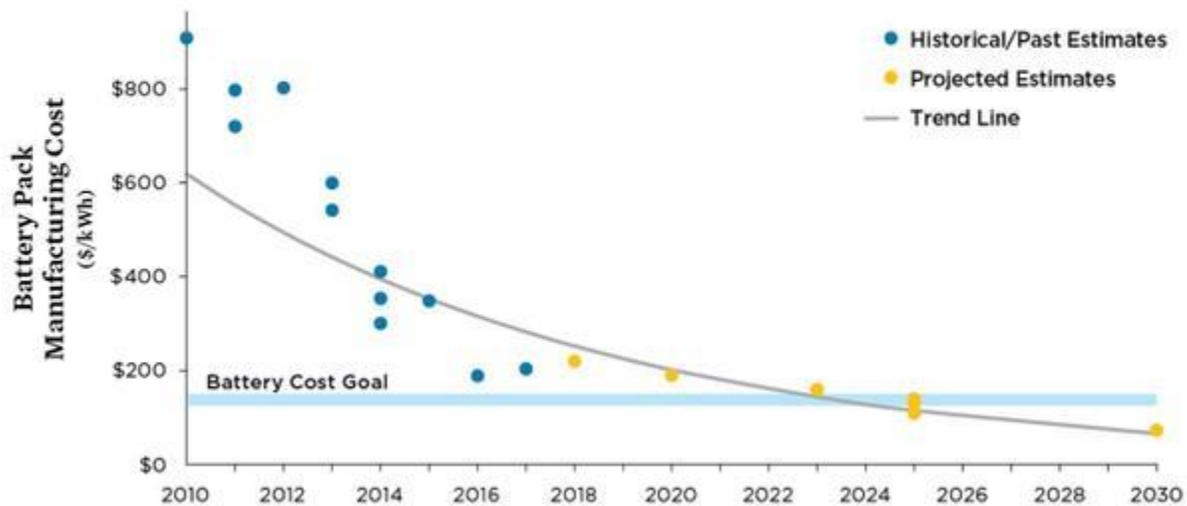
Carbon180 has a new program that helps entrepreneurs develop "moonshot" carbon removal businesses. Each [Fellow](#) receives a \$100,000 grant to develop a detailed strategic plan for a billion-ton CO2 removal/year business.

Stanford University is offering "Understanding Energy" online this spring quarter ("[CEE 207A: Understanding Energy](#)", March 30 - June 3).

Featured program: **Solar Ready Vets Network is participating in the Hiring Our Heroes [Corporate Fellowship Program](#)**, which connects businesses with transitioning service members - businesses gain access to a recruiting pipeline of military talent. The first cohorts of 2020 will be located at:

- Camp Pendleton (San Diego, CA)
- Fort Hood (Killeen, TX)
- MacDill Air Force Base (Tampa, FL)

First-gen EV auto-batteries cost about \$2,500/kilowatt-hour; now, the cost is [\\$400](#). (*Insert: manufacturing costs of batteries, by year and forecast.*)



Electricity, Power and Efficiency

Featured story: On the one hand ... **consumption of electricity in the US declined in 2019 by 2.8%** (despite 2.3% GDP growth). Sales across all categories (residential, commercial and industrial) all fell. Further, electricity sales have fallen in five of the past ten years. On the other hand, ... the following sectors are consuming more electricity:

- Data technologies - data and predictive analytics, machine learning and AI.
- The internet, cell phones and social media.
- Smart appliances and home solutions.
- Almost all technology manufacturing centers in China, marijuana growers outside of California, and bitcoin miners worldwide.
- Data centers (use 10X the amount of electricity of office buildings per square foot).

Note: 62.7% of the world's grids are powered by coal and natural gas; renewables and hydropower contribute 17.5%. AES Premium Members have access to a peer-reviewed study of [power consumed by data centers and other technologies](#).

The 52 largest US electric utilities have been ranked according to "efficiency." (The metrics fall into three categories: (1) energy efficiency program performance, (2) program offerings and portfolio comprehensiveness, and (3) enabling mechanisms for efficiency. **The top-7 most efficient electric utilities are:**

1. (tie) Eversource MA and National Grid MA
2. San Diego Gas & Electric
3. Commonwealth Edison
4. Baltimore Gas & Electric
5. Pacific Gas & Electric
6. Los Angeles Department of Water and Power

The US National Energy Technology Laboratory (NETL) [reports](#) that **the Eastern Interconnection desperately needs about \$1 billion in additional natural gas pipeline capacity and baseload generation units** (such as coal or nuclear) to provide reliable and affordable electricity during extreme weather events.

The Vogtle nuclear power plant in Georgia, the first nuclear reactor in the US in 30 years, is now 84% complete. (Note: construction is two years behind schedule and \$1.1 billion over budget.)



Quotes: "To be clear ..."

"To be clear, after like two years of doing nothing, Treasury (the IRS) put out some guidance for 45Q (carbon capture tax credits) ... [pause] ... it's totally inadequate. It's like they didn't answer the mail."

- Ernie Moniz, former US Secretary of Energy

"To be clear, all we ask for is assurance ... [pause] ... *certainty* - that the EPA will follow the law.... But it appears they've missed the mark ... again."

- Joni Ernst, Senator Iowa, on the Agency changing the renewable fuel standard ... again.

"To be clear, I don't want to prescribe what the president would or shouldn't do. He's very capable of handling this situation. But to be clear, we are looking for targeted assistance."

- Harold Hamm, founder of Continental Resources, on federal aid for the oil industry that has been affected by the coronavirus.