

# Energy Matters

August 31, 2020

Soundbite summaries of the energy news you need to know.

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## Fossil Fuels

### Oil: Terrorism and disruption in the oil & gas sector:

- [Syria](#). The Arab Gas Pipeline between the Syrian towns of Ad Dumayr and Adra exploded, and the attack has been attributed “almost certainly” to ISIS.
- [Saudi Arabia](#). Saudi Aramco is preparing for another attack on its oil production facilities by Houthi rebels, especially within 50 miles of the border of Yemen.
- [-Mozambique](#). A terrorist organization probably aligned with the Islamic State has claimed responsibility for dozens of attacks in the supergiant Rovuma Basin, a 180 trillion cubic feet natural gas reserve (or, 29 billion barrels of oil) offshore of Mozambique. (*Editor's note*: the identity of the terrorists responsible for the attacks have not been confirmed, but locals call them al-Shabaab or al Sunna wa Jumah.)



**Natural Gas:** Natural gas produces about 28% [less](#) CO2 emissions than heating oil and 50% less than coal for the same amount of energy when burned; however, this data does not include flaring.

**Coal:** In a NETL-supported project with Virginia Tech, researchers developed technology that can [extract rare earth elements \(REE\) from coal refuse](#) in shales and clays. The project successfully produced a solution containing a final REE concentrate of 15% - 18% by weight, exceeding the objective of 2% REE by weight.



**Carbon Capture:** Occidental Petroleum has formed a company called [1PointFive](#) to build and deploy direct air carbon capture plants. The first facility will be deployed in the Permian, Texas.



## Low Carbon Energy

### - A comparison of non-carbon sources of electricity:

- In 2019, there were 38 days when US utilities got [more electricity](#) from hydroelectric, wind and solar generation than from coal.
- Through June 2020, there were 122 days when hydro, wind and solar out-produced coal, including every day in the month of [April](#) and 28 days in May.
- Non-carbon sources of renewable energy will produce more electricity than coal in 2020 — the [EIA did not anticipate](#) this would happen until 2031.

### - Spotlight, [nuclear fusion](#). There are two leaders racing to achieve energy's most elusive prize:

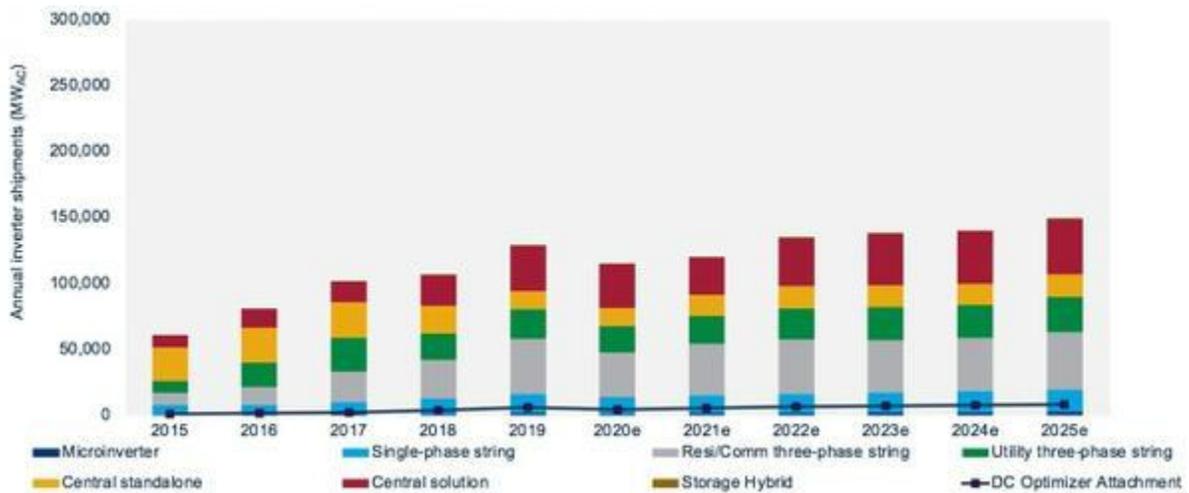
- European ITER in France, a collaborative project between 35 nations, anticipates their large-scale tokamak reactor will produce plasma in 2025, and commercial-grade some years later.
- Joint European Torus (JET) in the UK, a smaller fusion reactor (insert), promises to produce its first plasma in 2021.



- **Solar PV inverters** are used to convert variable direct current (DC) output of a photovoltaic (PV) solar panel into alternating current (AC) fed directly into a commercial electrical grid or used by a local, off-grid electrical network.

- In 2019, the global PV inverter market was about \$9 billion (or, about 130 GW).
- The pandemic will cause the global PV inverter market to decline 14% (Y/Y).
- The top three vendors of solar PV inverters have held the same positions from 2015 to 2019: Huawei, Sungrow and SMA.

*Insert.* Global annual PV inverter shipments, 2015 - 2025e (MW):



## Policy

- Poorer neighborhoods in large US cities like Baltimore, Portland and New York are sometimes 10 degrees [hotter](#) during the summer than wealthier neighborhoods, all other things being equal.
- Considering such factors as terrain, temperature, the price of electricity, demand and especially regulatory policy, **the most promising states to adopt widespread EV trucking are, in order: California, Pennsylvania, Texas, Washington, Maryland and New York.** AES Friends have access to the report on "[High Potential Regions for EV Truck Adoption.](#)"

## Beltway Buzz

**The ethanol RFS controversy continues to burn**, with the ethanol lobby demanding an increase in the standard while 16 refinery CEOs sent a letter to Trump asking for reductions or waivers. AES Friends have access to a true and correct PDF copy of the [letter](#).

- President Trump announced final plans to [open ANWR](#) to oil and gas companies. The Department of Interior said it completed its required reviews, and the auction of leases in the refuge's coastal plain will take place later this year. Of course, legal battles will ensue.

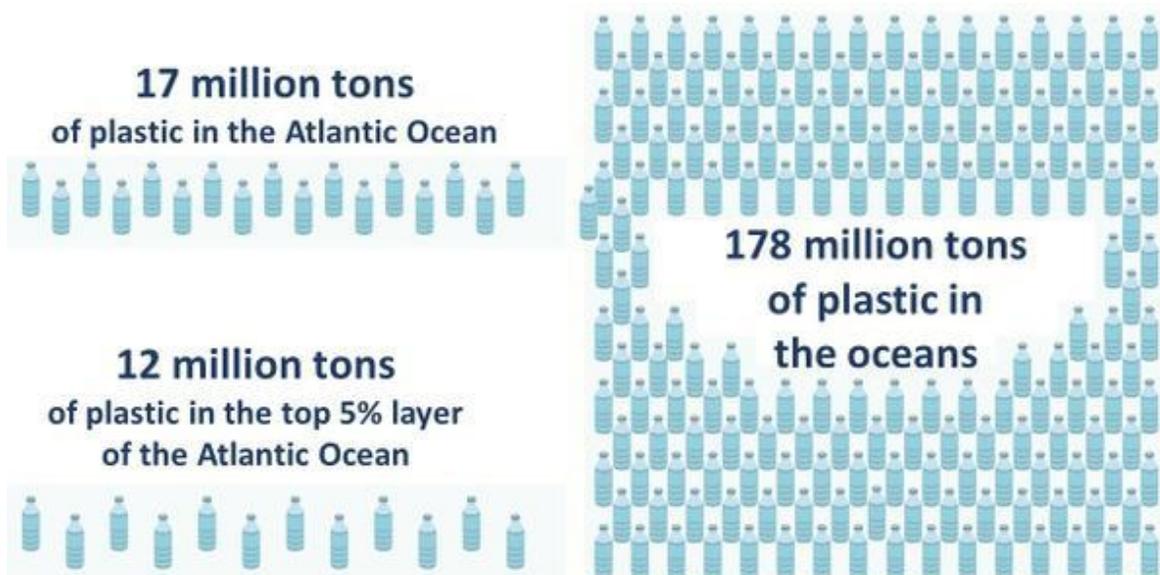
## Policy Around the World

- Natural gas and nuclear industries have asked to be included as "Green Energy" by the EU's Sustainable Finance Taxonomy. By forcing investors to disclose which investments meet climate criteria, the new EU green finance rules will incentivize funding of projects that support the bloc's climate goals.



## Climate and Sustainability

- When Hurricane Laura hit landfall in Texas and Louisiana, it took eight refiners that make diesel fuel and gasoline offline - about 2.78 million barrels a day of processing, or close to 15% of US capacity. In addition, there were about 800,000 outages across the states of Louisiana, Texas, Arkansas and Mississippi.
- Special report - [plastic in the oceans](#). It appears that **ocean plastic levels are at least three times higher** than previously thought. Scientists sampled water from the upper areas of the Atlantic Ocean and found about 12- 21 million tons of microplastic in the top 200-meter layer.



- **Earth Overshoot Day** marks the date when humanity's demand for ecological resources and services in a given year exceeds what

**Earth can regenerate in that year**; for the rest of the year, there is an ecological deficit.

- 2006: October 15
- 2015: August 13
- 2019: July 29

(Note: not all AES experts agree with this statistic. It doesn't distinguish between sustainable and unsustainable uses of crop and grazing land and doesn't account for all methods of carbon sequestration, like ocean and soil.)



- **There are about 40,000 chemicals on the market today, and only a few hundred are regulated.** Most are undetectable and unsafe in drinking the water. AES Friend Erin Brockovich invites AES Friends and Members to participate in the first-ever national self-reporting toxin registry ([beta](#)), a crowd-sourced map that allows users to report and review unsafe issues.



## Research to Markets

- *CVC trend-spotting.* Corporate venture capital investment in healthcare and biotech companies is on pace to set new records in 2020, but [CVC investment in energy will not](#). **The lessons of the 2008 recession seem to have had a greater influence on energy-related CVCs.** For instance, Toyota's AI Ventures (TAIV) formed well after the Great Recession but the risk-averse structure and level of independence of the fund is designed to withstand a recession and avoid the trap that befell many CVCs in 2008: borrowing heavily on institutional venture capital funds that prioritize financial return above strategic return.

- In 2019, **1% of all airline passengers participated in voluntary carbon offsetting**; [fewer](#) travelers are contributing a carbon offset fee during virus-induced travel restrictions.

- ESG investing refers to three factors used to measure the sustainability and societal impact of an investment: Environmental, Social, and (Corporate) Governance. Some believe these criteria help better determine the future financial performance of an investment. **A brief survey of the ESG financial market:**

- The rapid development of the "COVID [bond](#)" market, with \$236 billion (USD) issued globally during the five month peak of the pandemic, suggests that capital is being directed towards ESG objectives.
- The UBS investment bank saw \$71 billion invested in its [ESG bonds](#) in Q2 2020, bringing its ESG assets under management to \$1 trillion for the first time.
- Since 2019 to the present, ESG risks generally have not had a direct impact on credit ratings (less than 3%), while the impact is most significant on the downside.
- Of all the companies on the "[Top Concern](#)" Fitch Ratings list (total valuation \$26 billion), 54% are energy companies.

- S&P Dow Jones Indices (a benchmark index of 30 stocks) added Salesforce and Honeywell to **the Dow** and [cut ExxonMobil](#) and Raytheon Technologies. (The decision balances the disruption of Apple's 4-to-1 stock split.) Chevron is now the Dow's only oil and gas company.



## Electricity, Power and Efficiency

### - Spotlight, California wildfires and interrupted electricity supply.

- From August 14 - 17, there were 367 unique wildfires throughout California, most of which were caused by lightning; many are still burning. As of the 17th they had burned 350,000 acres and 900 structures; at least five people died, and a few thousand evacuated their homes. As a precautionary measure, utilities responded by implementing rotating power outages, which led to insufficient electricity supplies.



### Background

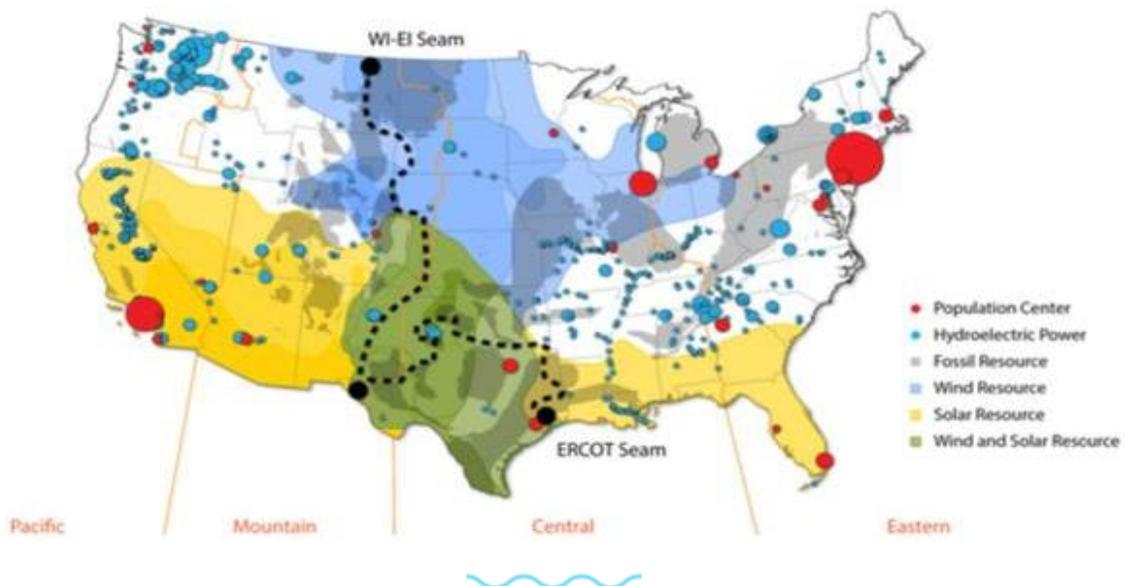
- Outages were about 1000 MW when demand was over 40,000 MW and lasted 1-3 hours.
- California ISO wholesale power prices spiked near [\\$600/MWh](#) on August 17.
- Demand on the hottest days of the year is about 50% higher than on a typical summer day, and that difference is virtually all cooling. (Note: if the outdoor temperature is 95° degrees, it takes about 20% more electricity to keep a building at 74° rather than 78°.)
- With so much solar generation now on California's grid, the biggest supply crunch comes later in the evening as the sun is setting, typically between 6 pm and 8 pm in the most challenging months, July through September.

### Solutions

To ensure there is sufficient capacity on the grid (known as “resource adequacy”) during wildfire season, California has three methods of response:

- Rotating power outages (see above).
- Flex Alerts, in which the state puts out a public request for voluntary conservation.
- Critical peak pricing (CPP) - lower prices throughout most of the year but higher price when supply is tight.

- A nearly impermeable electrical “[seam](#)” divides the US eastern and western power grids. These giant pools of alternating current on either side of the Rockies contain a total of 950 gigawatts of power generation by thousands of power plants. (A third grid serves Texas.) But only a little over one gigawatt can cross between them. (For instance, western-grid power plants in Colorado can send bulk power 1,000 miles to California, but not to its border-state Nebraska.)



## Quotes

### Public-Private Partnership "Problem-ship"

"We have seen these threats before."

- Illinois Gov. JB Pritzker on Exelon's plan to shut down two nuclear reactors because they are uneconomical without state funds. Exelon also notes that 1,500 jobs and 4,300 MW of clean electricity will be lost when the two nuclear plants shut down.

"I have noticed the changes that Jeff has been able to work in this organization, and I have been impressed."

- TVA Board Chair John Ryder, defending the \$8 million/year salary of CEO Jeff Lyash. At \$8 million/year, Jeff Lyash is the highest paid federal employee in the country; however, his salary is also in the bottom quartile of peer utility CEOs.