

Energy Matters

November 9, 2020

Soundbite summaries of the energy news you need to know

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News from the Society

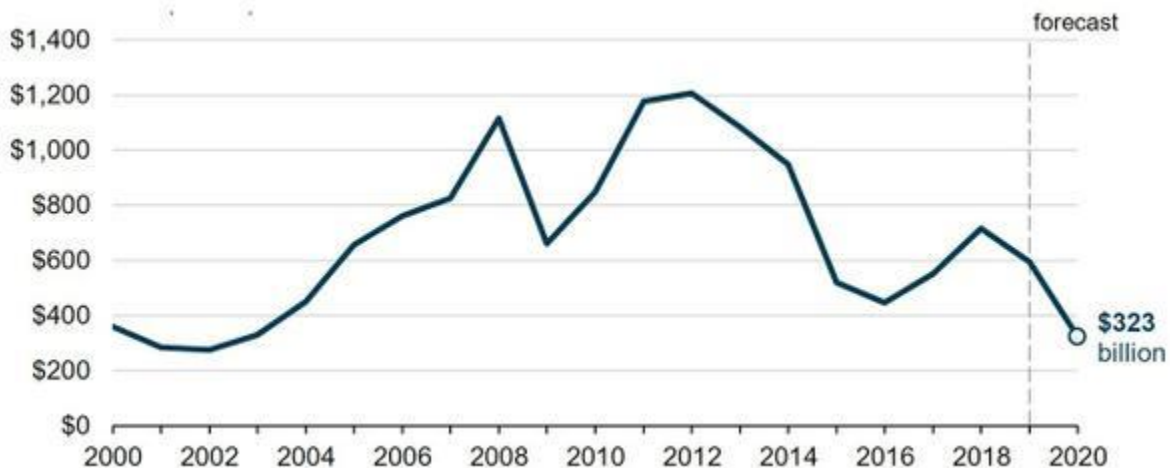
Forthcoming special end-of-the-year publications:

- *November 17: Energy Writer of the Year 2020* - the premier literary award for energy.
- The Energy Awards: Energy Person of the Year, Energy-Tech of the Year, Energy Movie of the Year, and more....
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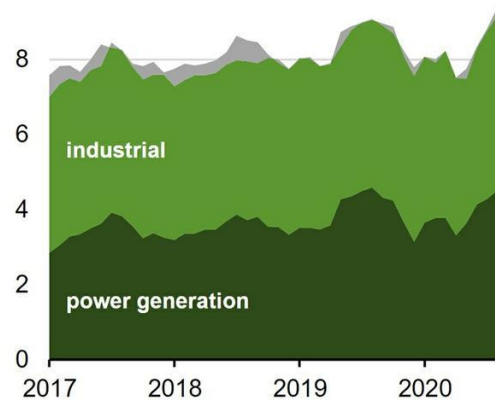
Fossil Fuels

Oil: OPEC's declining net oil export revenues 2000-2020, in billion USD (*insert*)

- 2012: OPEC earned \$1.2 trillion in net export revenues
- 2019: OPEC generated \$595 billion in net export revenues
- 2020: OPEC will generate \$323 billion in net oil export revenues



Natural Gas: In the past few months, **Mexico has had a voracious appetite for natural gas from the US**, probably because a new segment on the Wahalajara pipeline was completed in June 2020. (*Insert: Mexico's monthly consumption of natural gas imported from the US, in billion cubic feet per day.*)



Coal: Emission intensity increases exponentially the bigger the open pit. In other words, open-pit mining benefits from economies of scale, but [emissions are exponential the larger the pit](#).

Carbon Capture: L'Oréal, Total, and Lanzatch have produced a cosmetic plastic bottle made from industrial carbon emissions.



Low Carbon Energy

- [Utility-scale battery storage costs](#) decreased nearly 70% between 2015 and 2018, and a new [report](#) suggests that prices continue to fall.

- **Prices for glass that coats photovoltaic panels have risen 71% in the past few months.** The solar industry is turning toward bifacial panels, which increase both power output and glass requirements. Solar panel producers in China have asked the government, home to most solar manufacturing, to build new factories. Until then, prices will continue to increase and solar project development will slow.



- **Eight of the 36 public utilities in the Utah Municipal Power System have [backed out](#) of a deal to deploy NuScale small modular reactors.** The SMR deployment project has been delayed 3 years to 2030 and costs will increase from \$4.2 billion to \$6.1 billion. Related, the US DoE announced that it would award NuScale \$1.4 billion for the next ten years to support RD&D.

- South of Salt Lake City, there is a geological formation known as a [salt dome](#), a column of salt surrounded by sedimentary layers. If filled with hydrogen, **this salt dome could become a renewable energy reservoir.**

Around the World

- The European Commission is offering [financial support](#) for qualified projects that support cleantech and climate resilience.



Policy

- US elections 2020, a few energy insights from AES:

1. **Oil yawns.** Oil markets are actually more interested in COVID developments and OPEC+ promises than the election. (US rig counts for oil and gas did not change significantly pre- and post- election: +9 to 296; in contrast, one year ago there were 822 total rigs.)
2. **The “green wave” fades.** Environmentalists' ambitions failed to materialize nationally. (In the Senate, only two Democrats - John Hickenlooper in Colorado and Mark Kelly in Arizona - pushed environmental policy, and it is not yet clear if the issue had a neutral or negative impact on any electoral outcomes).
3. **Strategy strikes out.** Neither party made a convincing case that their energy policies would result in what American voters want most of all: *jobs*.
4. **Look ahead by looking back at history.** If the US federal government is split or rendered ineffective (aka, when the two party's split leadership of the bicameral legislature and the executive branch), the states with more legislatures and governors always fill the void. (If this happens, *AES will track formative energy and environment policies that will undoubtedly emerge in states such as California, Texas, New York, Pennsylvania, Colorado, and Massachusetts.*)

- *The election you need to know about but may have missed:* The Texas Railroad Commission might be the most powerful governmental agency that no one knows. Established by the Texas Legislature in 1891, the TRC largely set world oil prices until 1973 when OPEC formed. Today, the TRC focuses entirely on setting monthly production rates for oil, gas, mining, propane, and pipelines in Texas - one of the most consequential hydrocarbon regions in the world. **The Republican candidate, Jim Wright appears to have defeated the Democrat candidate, Chrysta Castañeda, by nearly 10 percentage points.**

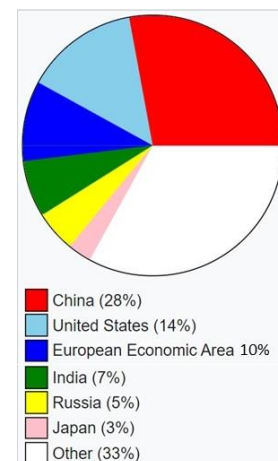
- *On the other hand ... the election you may have wanted to miss:* Nevada voters approved Question 6 on their ballot, which mandates that Nevada utilities shift to at least 50% renewable energy by 2030. The initiative is less about voters changing where their electricity comes from than confirming a decision they already made — **Nevadans passed the exact same initiative in 2018.** To amend the state constitution, Nevada voters must always pass an initiative twice, which landed the issue back on the ballot this year.

- **Trump surprisingly named James Danly to replace Neil Chatterjee as chairman of FERC,** the influential federal panel that oversees natural gas pipeline approvals and wholesale electricity markets. Chatterjee, a former staffer for Republican Senate Majority Leader Mitch McConnell, has sometimes strayed away from the Trump administration's efforts to promote fossil fuels like coal. Under Chatterjee, FERC approved an order to allow energy storage to participate in wholesale markets, distributed energy resources to contribute to local markets, and opined that the commission would be open to allowing carbon pricing in the nation's power markets.

Policy Around the World

- An update on the 2015 Paris Climate Accord:

- The agreement's language was negotiated by representatives of 196 state parties at the 21st Conference of the Parties (COP21).
- The goal of the Accord is to keep the increase in global average temperature to below 2 °C (3.6 °F) above pre-industrial levels in order to reduce the risks and impacts of climate change. ([Article 6](#): "This should be done ... as soon as possible.")
- Every nation that joins the Accord has committed to an emission reduction target (insert: global CO2 targets, by region).
- Any nation can choose to exit or join the accord at any time.
- The US is the only country to exit from the agreement so far.



Climate and Sustainability

- [The changing climate's obituaries](#), a sample:

- Burrwood, Louisiana: cause of death, erosion and subsidence
- Holland Island, Maryland: cause of death, erosion and sea-level rise (*insert*)
- Valmeyer, Illinois: cause of death, river flooding
- Shasta City, California: cause of death, wildfires
- Cumberland Island, Georgia: cause of (possible) death, hurricanes and sea-level rise



- A network of seismic stations throughout the Western US feeds data into [ShakeAlert](#), an earthquake early-warning system designed to give people enough time to drop, cover, and hold before an earthquake's waves roll through. **Recent wildfires destroyed many of these stations, which breaks the "telemetry" (interconnectedness) of the system.** In other words, when one tower goes out, the feed between all the towers in the region is broken.

- Nearly 1 ton of CO2 is [emitted](#) per ounce of gold produced.

Around the World

- Over 90% of the energy trapped by greenhouse gases ends up warming the ocean. **The Indian Ocean is heating [faster](#) than any other ocean** (+0.044 K per decade).

- Between 2011-2013, **China poured more concrete** than the US did in the entire 20th century.



Research and Markets

- **Rare Earth Minerals:** NETL is sponsoring a new [FOA: "Carbon Ore, Rare Earth and Critical Minerals"](#) that will expand the **potential value of coal basins** in the US, including but not limited to: the extraction of critical minerals (CM), the promotion of nonfuel carbon-based products (CBP), and the sequestration of carbon ores. Closing date: January 5, 2021.



- Looking ahead, **the California Energy Commission will announce in late December a \$14 million solicitation for [mobile microgrids](#)** that will provide resilience during grid outages related to public safety power shutoffs.

- **Energy stocks:** With only a few weeks remaining in the year, energy sector stocks have [declined](#) 52.5% this year. (Note: the second worst-performing sector, financials, lost 22.5% this year.) The drawdown exceeds the relative losses in tech after the internet bubble burst in 2000, and in financials following the 2008 Great Financial Crisis.

- **ESG:** No one knows how much the three factors - Environmental, Social, and Corporate Governance - have influenced investing, but it is a lot:

- Bloomberg: \$12 trillion is committed to sustainable investing.
- Fish, Kim and Venkataraman: \$30 trillion in sustainable assets under management.
- Matos: \$80 trillion worldwide.

- **Circular economy:** The cost to develop [lab-grown meat](#) is about \$100 to \$150 per pound. Scientists must isolate stem cells from an animal and allow them to multiply in a lab, regenerating muscle, fat and tissues.

Around the World

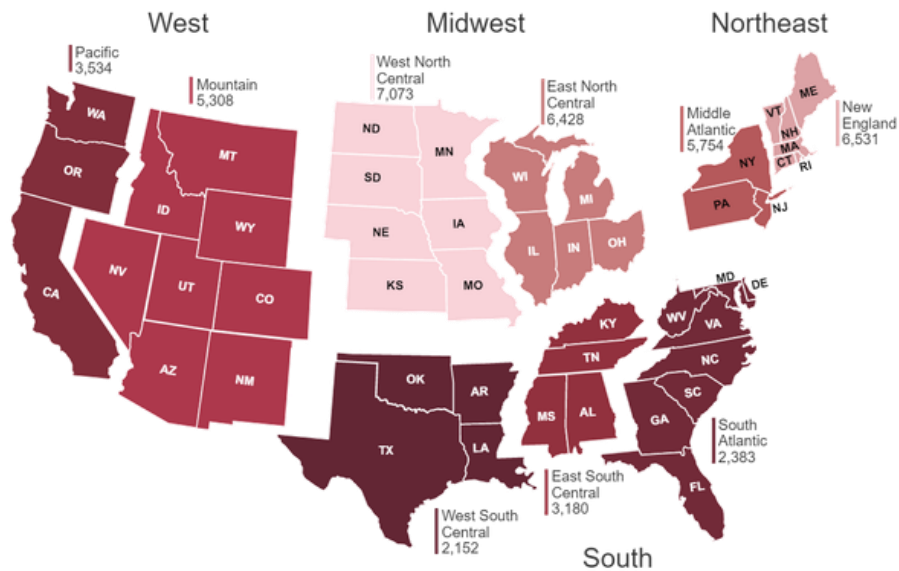
- Scientists at the University of Cambridge created a "[photocatalyst sheet](#)" that converts carbon dioxide and water into formic acid that can be used as a carbon-free fuel. The findings represent an important **advance in artificial photosynthesis**, which mimics the process in nature where plants use light energy to convert CO₂ and water into sugar and oxygen.

- The European Commission will provide [financial support](#) for qualified projects that support preparedness and enhance resilience caused by the changing climate, with special emphasis on clean energy technologies.

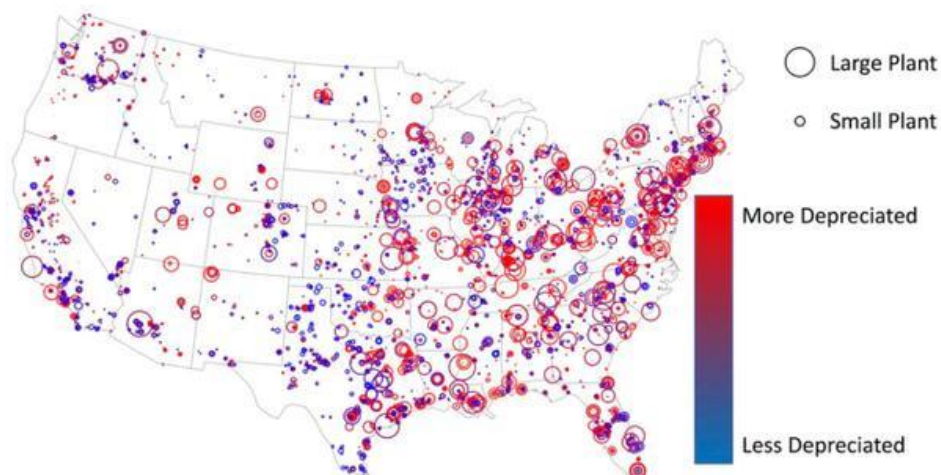


Electricity, Power and Efficiency

- *Featured insight:* Utilities often use "heating degree days" as a unit to measure the anticipated demand for energy needed to heat a building, where standard temperature is 65° Fahrenheit (F). For example, a day with a mean temperature of 40°F has 25 HDD; two such cold days in a row have a total of 50 HDD for the two-day period. ("Cooling degree days" are the opposite unit for air conditioning.) **The anticipated HDD for the entire 2020–21 winter is 602**, which is 5% more HDDs than last winter. (*Insert:* heating degree days by census division.)



- Location and depreciated status of all power plants in the US (*insert*):



- Demand for [distributed resources](#) in California is starting to surge. Spurred in part by Pacific Gas and Electric's public safety power shutoffs to prevent sparking wildfires, which have left millions of residents in the area without power, demand for distributed energy solutions this year has already surpassed demand for the prior three years combined.

Around the world

- **Hydropower accounts for 91% of electricity production in Norway**, followed by wind power (7% share) and thermal power (1.5%). (Note: recently, [electricity prices](#) in parts of Norway fell below zero again, which meant that residents 'got paid' for using electricity.)



Quotes: The future will be ... interesting.

- "Climate change is a serious existential threat. We cannot afford to miss out on this one." - Rep. Kurt Schrader (D-Oregon) on the need for the next president to aggressively promote long-term climate legislation

"If Democrats adhere blindly to Ecotopian absolutism, glasses may clink at Davos, on Wall Street, and in San Francisco, but 'the party of the people' will surrender its historic legacy." - Chapman University's Joel Kotkin