

# Energy Matters

October 12, 2020

Soundbite summaries of the energy news you need to know

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## News from the Society

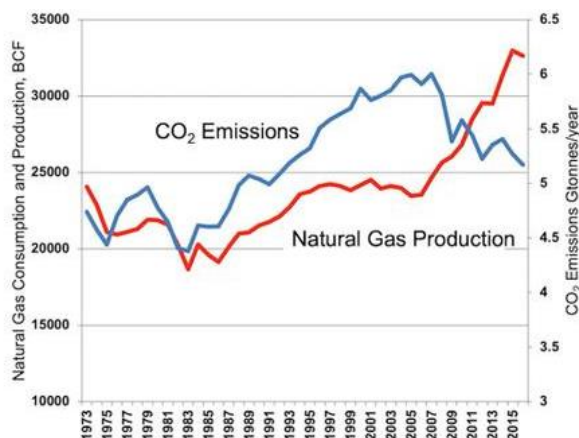
- **Silicon Valley Energy Ecosystem** (release date: October 19): a comprehensive review and report that includes a list of the top 253 influencers, analysis, and more
- In case you missed it: [Top US Energy Universities 2020](#)
- Encourage your colleagues to [join AES](#). (\$129/year; Friends are free.) [Contact us](#) for information about organizational membership discounts.

## Fossil Fuels

### Oil: Oil exploration and production activities in Africa, a survey:

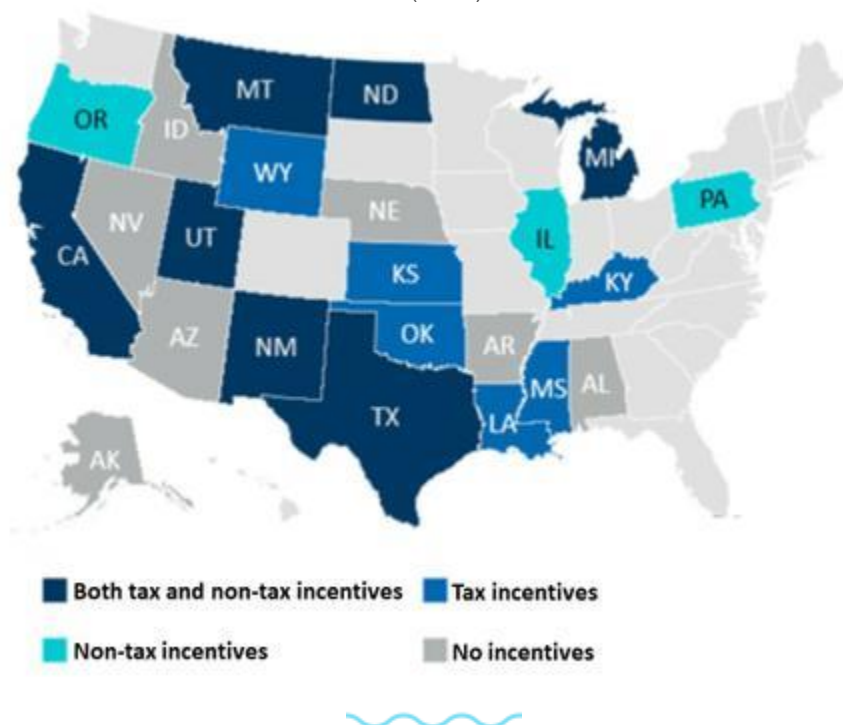
- [Uganda, Kenya](#) and Total are building a pipeline to carry Ugandan oil to the Kenya coast.
- [South Africa's](#) offshore Luiperd Block might be larger than 500 million barrels.
- [Zimbabwe](#) is expected to approve drilling of its first exploration well.
- [Gambia](#) granted PetroNor a 30-year drilling license.
- [Mozambique's](#) entire inventory of offshore oil blocks are fully subscribed (though exploratory drilling has been temporarily suspended due to the pandemic).
- [Angola](#) has approved plans to expand exploration activities to 1 million bpd.

### Natural Gas: Natural gas and emissions - correlation, causation, or coincidence?



**Coal:** China [added](#) 11.4 gigawatts of coal-fired capacity in the first six months of 2020, more than half the amount built worldwide during the same period; moreover, nearly 250 GW of coal-fired plants are under development in China (for perspective, the equivalent amount of power consumed by Germany in 2019).

**Carbon Capture:** States active in CCUS incentives (insert):



## Low Carbon Energy

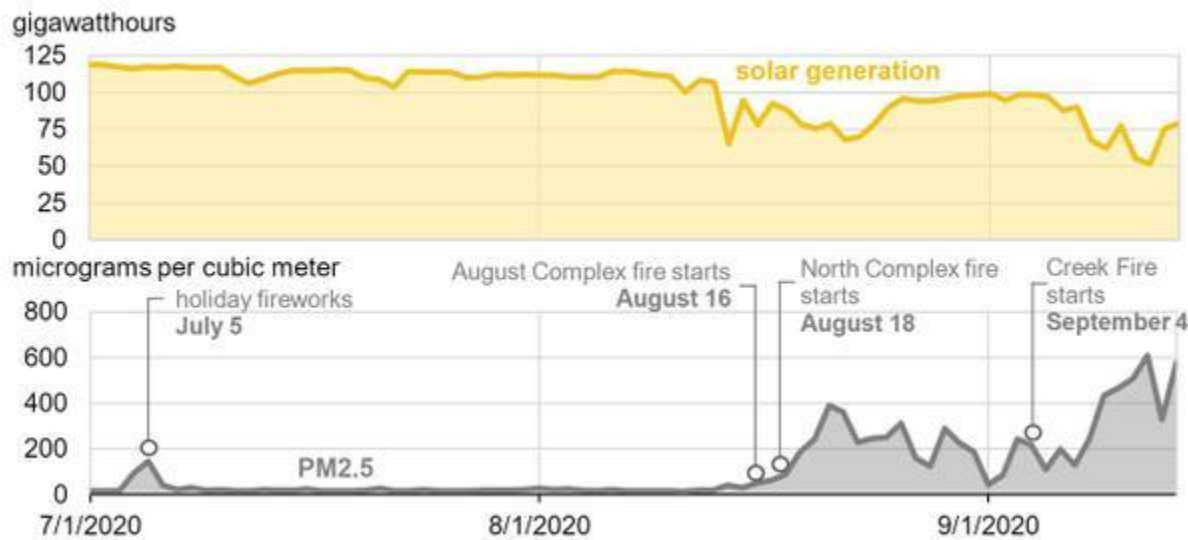
- *Spotlight - [Hydrogen](#)* (currently the hottest topic in energy; last month - electric vehicles):

- **Grey hydrogen:** made using fossil fuels like oil and coal, and emits CO<sub>2</sub> into the air as it combusts; mainly used in oil refining and the production of fertilizer, it is the largest hydrogen market in the US by a significant margin.
- **Blue hydrogen:** made in the same way as grey hydrogen, but carbon capture technologies prevent CO<sub>2</sub> being released.
- **Green hydrogen:** produced using electrolysis powered by renewable energy, like offshore wind, to produce a clean and sustainable fuel.
- **Price comparisons:** the price for grey hydrogen is €1.5/kg; the price for green hydrogen is about €3.50 to €5/kg.

AES Members have access to a PDF of both the [Executive Summary](#) (20 pages) and the "[Road Map to a Hydrogen Economy](#)" full report (96 pages).

- *Spotlight. [“ZELFR”](#), a zero-emitting load-following resource.* Traditional geothermal energy production can be enhanced by applying oil and gas technologies. An underground aquifer that produces hot water is "augmented" by frac'ing the large underground "radiator" and then connecting it to the surface with 50 km of wellbores pipelines. At the surface, the geothermally heated water is used either for direct heat or converted to electricity. [Eavor](#) (pronounced "ever"), with funding from Duke Energy, is testing its newly developed geothermal ZELFR techniques.

- Smoke from the California fires decreased solar generation (*insert*):



## Policy

- The Supreme Court has decided to hear in its next session at least one energy related case and maybe two others:

1. The Court will address the issue of climate change liability against fossil fuel companies and whether climate torts brought by local governments can be pursued (e.g. [BP and petitioners v. Baltimore](#)) - AES Members have access to a PDF copy of the *Petition for a Writ of Certiorari*, US Supreme Court.
2. *Pending*: A petition asking whether a state's sovereign immunity can thwart a \$1 billion gas pipeline (e.g. [New Jersey v. PennEast Pipeline](#)).
3. *Pending*: A battle between the biofuels and petroleum industries over federally mandated renewable fuel standards (e.g. [Renewable Fuels Assoc. v. E.P.A.](#)).

- Current [subsidies](#) for the hydrogen economy, a world-wide comparison:

- \$5 USD per capita (or about €4) in China
- \$3.50 per capita (or about €3) in Japan
- \$1 per capita (or about €0.75) in the United States
- \$.50 per capita (or €0.60) in the European Union

- California passed a law that will **allow dead/burned trees to be harvested as biomethane and turned into [renewable natural gas \(RNG\)](#)**. *Note*: there are nearly 150 million dead trees in California's forests; harvesting dead trees and converting them to renewable natural gas can remove deadly fuel for wildfires and help reduce greenhouse gas emissions. CalFire as well as state utilities support the law.

## Policy Around the World

### Trend-spotting "The Shovel Wars"

- There are [17 rare earth minerals](#) used in a variety of energy related devices, such as cobalt for common battery storage. A majority of these minerals are mined in Africa. **The global production of rare earth minerals from Africa has increased from less than 20,000 metric tons in 1970 to about 150,000 metric tons today.**

- Related, **the Russian army (and its private contractors) have [expanded](#) military operations in Africa**, including basing rights in a half dozen countries and military cooperation agreements with 28 individual African

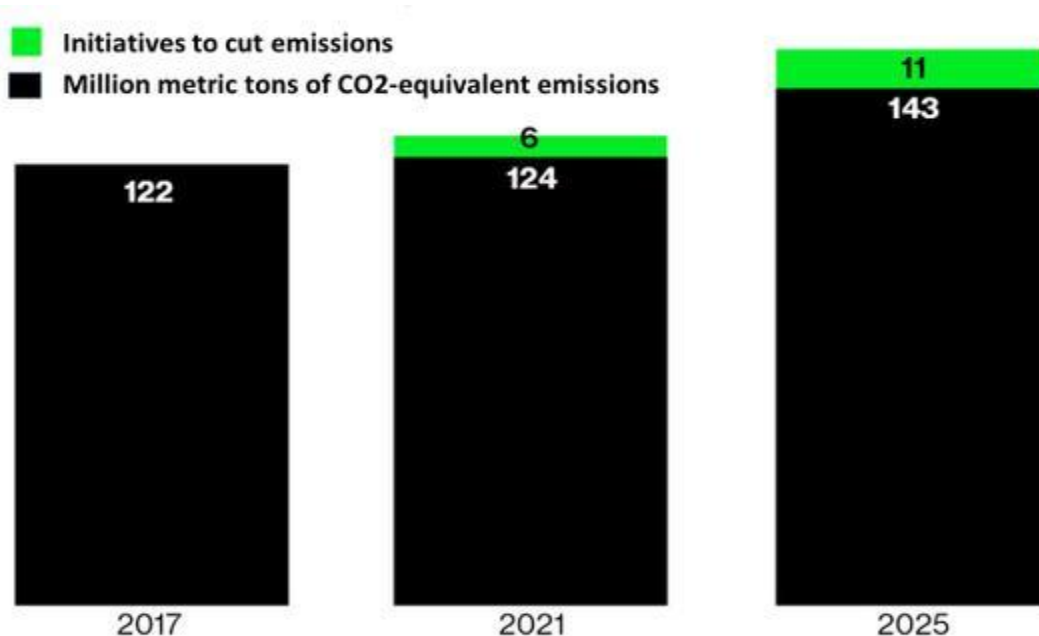
governments (such as Central African Republic, Eritrea, Democratic Republic of Congo, Sudan, Libya, and Mozambique). Russia is also the largest exporter of weapons to Africa.

- Meanwhile, about **50 Chinese state-owned companies are developing hundreds of infrastructure projects all over Africa**, and [trade between China and Africa has increased](#) significantly. Imports of Chinese cement to Kenya increased tenfold in 2016; in 2018, Chinese exports of steel to Nigeria rose 15%; Algeria has tripled its imports of Chinese goods; in 2019, China's global aluminum exports to Africa increased 20%, and China exports about \$46 billion in goods and services to Egypt, Ghana, Kenya, Nigeria, and South Africa.



## Climate and Sustainability

- Special report: Exxon's internal strategic investment plan shows that the company **will increase its net annual emissions from 122 million metric tons of CO<sub>2</sub>e to 143** (*insert*), or about the annual carbon dioxide emissions of Greece. Exxon's expected emissions contrasts with international efforts to reduce emissions and its industry rivals like BP and Royal Dutch Shell. (*Note: Exxon's internal documents are projections rather than measured data, and they pre-date the COVID pandemic; further, the largest US oil producer has never committed to lowering emissions, so its internal report is consistent with its public position.*)



- **Hurricane Sally**, by the numbers:

- The eighth named storm to make landfall this Atlantic hurricane season
- 105 mph winds; 35 inches of rain
- Alabama: 160,000 outages; Mississippi: 41,000 outages
- Spillway gates were opened on the Lay, Jordan, Harris, Turlow, Coosa, Martin and Yates hydropower dams

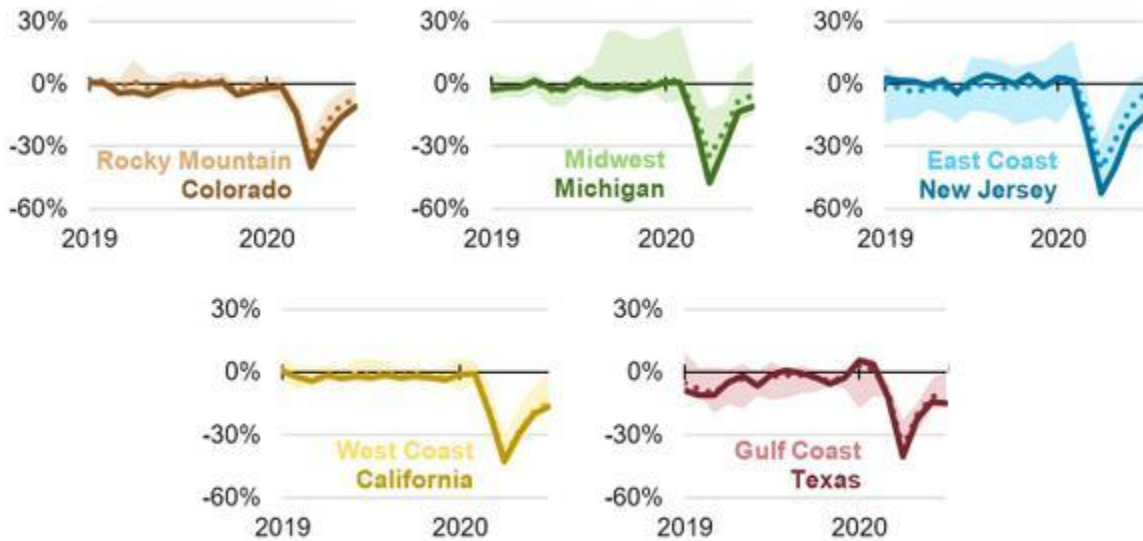
- The August Complex wildfire in California began almost two months ago after lightning strikes ignited 37 fires that merged together; **it was the first [gigafire](#) in recorded history** (a fire that burns seven figures of acreage).



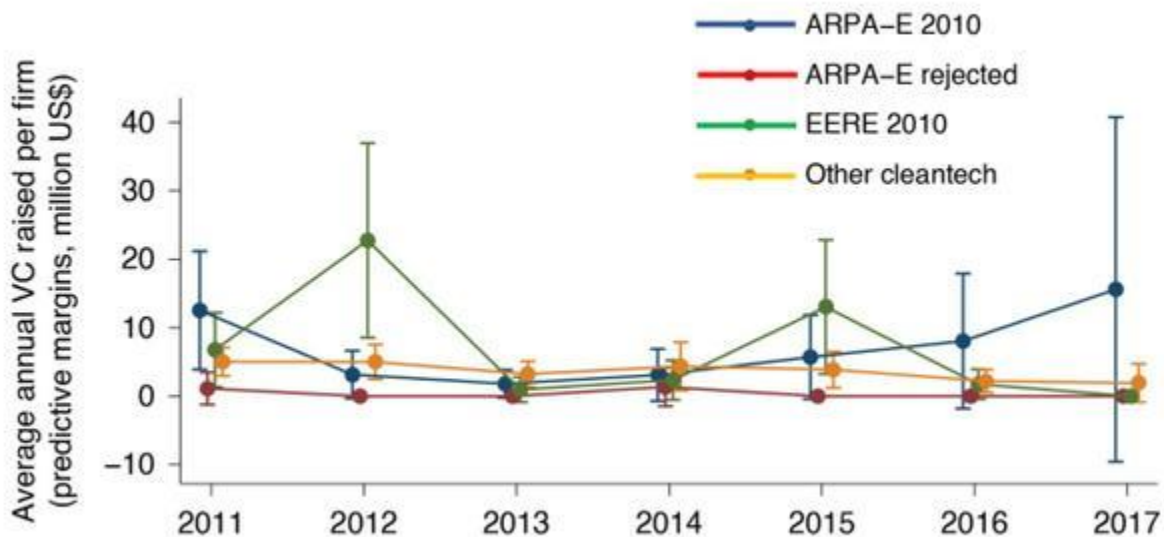
## Research and Markets

- A FERC-hosted technical conference on carbon pricing shattered its attendance/engagement record by 10X. The question that drew such a large audience: [Does FERC have the legal authority to implement a carbon price?](#) (Note: no decision was made.)

- **Sale of petroleum fuels declined during the COVID pandemic in all US regions** as a percentage change from same month in previous year (*insert*):



- In 2009, the US Department of Energy started funding energy research through the Advanced Research Projects Agency – Energy (or ARPA-E) program. The goal was to take more risks than traditional federal efforts and help new renewable energy technologies get off the ground. *Question:* how has ARPAe's first class performed in terms of securing private funding, as compared with the applicants in that same class that did not receive an ARPA-e award or received funding from a different public or private source? *Answer:* **ARPA-E winners were somewhat more successful getting venture capital funding** (though a small sample size).



## Electricity, Power and Efficiency

- **Top-10 [most improved](#) cities, by energy efficiency and scaled renewable energy last year:**

1: New York City

2 (tied): Boston and Seattle

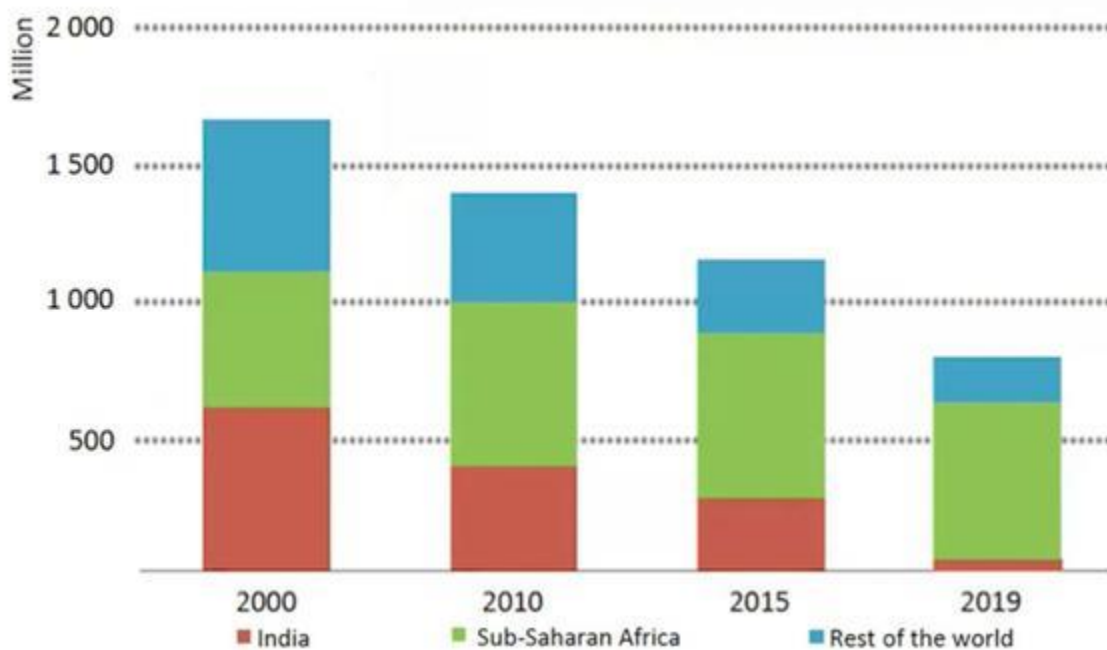
4 (tied): Minneapolis and San Francisco

6 - 10 (tied): Washington, DC, Denver, Los Angeles, San José, and Oakland

- In the US, [squirrels](#) cause about 8% of all electricity outages, while birds cause about 1.5% of total outages.

- FERC has issued its long-awaited decision on [aggregated DERs](#) (distributed energy resources) participating in wholesale markets. Enerdynamics is offering a new [online course about DERs](#) and their impact on customers, markets, and grid operations.

- **Number of people in the world without access to electricity.** (Note the contrast between the success in India vs. no progress in Sub-Saharan Africa.)



### Quotes: *A softening of the partisan divide*

"That Oregon Democrats and West Virginia Republicans are coming together to address climate change is a testament both to the gravity and urgency of this issue and to their seriousness as legislators." — House Energy and Commerce Committee Chairman Frank Pallone (D-NJ) in a statement to the EPA

"Economic conservatives and social libertarians know there are plenty of reasons to support regulations on behalf of cleaner [air conditioning] coolants." — Christopher Barnard of the American Conservation Coalition (ACC) in "*A Conservative Case for Phasing Out HFCs*"

"Both parties in the US House of Representatives should be commended for building a bipartisan bridge that is essential for the creation of durable climate policies." — Bob Perciasepe, President, Center for Climate and Energy Solutions, on the proposed McKinley-Schrader bill