

Energy Matters

August 17, 2020

Soundbite summaries of the energy news you need to know.

An official publication of ...



We are deeply saddened to learn that **Barry Worthington**, Executive Director of the **USEA**, passed away Friday at his home in Maryland. In a statement, USEA Chairman Sheila Hollis said: "It is impossible to completely articulate the grief we feel at this moment about the loss of Barry Worthington. We feel his absence acutely; he was our family, our champion. Barry was a remarkable leader, and his absence reverberates among us all."

Fossil Fuels

Oil: The Saudi-Russian oil over-production war is still upsetting markets, and the **sector continues on a path of self-inflicted chaos. For example:**

- Iran continues to ignore White House sanctions as it exports 600,000+ barrels of crude oil per day (most of it going to China). For instance, on May 3, an Iranian tanker transferred its crude oil to the Giessel, an Indian commercial ship, and then both manipulated their location trackers so they appeared to be in the Gulf of Oman while the Giessel headed to the Chinese port of Qingdao.
- Although Venezuela has the largest oil reserves in the world (in 2017, Venezuelan crude oil production was at 2 million bpd), the country is currently producing only about 150,000 bpd and it may soon drop to zero. Worse, Venezuela failed to meet its shipping joint venture agreement with China, so PetroChina acquired out of bankruptcy the country's three large crude carriers (the Junín, Boyacá and Carabobo, each with 2 million barrels capacity).
- The discovery of another elephant, the Starbroek Reserve off the coast of Guyana (in South America), could add up to 8 billion barrels of recoverable oil - equivalent to Brazil's entire offshore reserve. (Note: the Starbroek is Exxon's largest offshore discovery.)
- A Japanese oil tanker ran aground off the coast of Mauritius and split in two, spilling oil into the Indian Ocean (*insert*).



Natural Gas: The newly discovered Bashrush field in Egypt's shallow waters has an estimated production capacity of 100 MMscf of gas per day. (Note: In recent years, Egypt has become the new center of a 'natural gas rush', with the discovery of the Zohr field, one of the largest gas fields in the world.)

Coal: Since 2011, 121 coal-fired power plants have transitioned to other sources of fuel (103 to natural gas). Note: the switch from coal to natural gas was driven by stricter emission standards, low natural gas prices, and more efficient new natural gas turbine technology. Insert: coal-to-natural gas conversions, 2011 - 2019.



Carbon Capture: Due to wildfires (mainly in the western states) and extreme changes in climate, the scope and scale of forests in the US have been receding. **The state of forests in the US:**

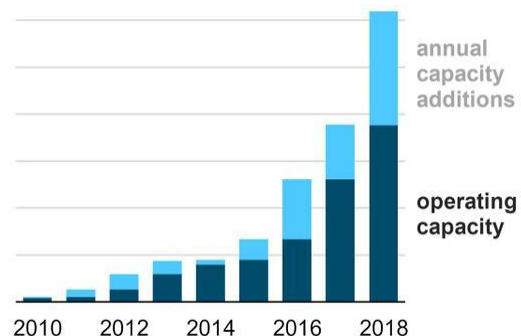
- About 400 million trees on 7 million acres have died due to extreme conditions.
- In US national parks, 1.3 million acres of forest have disappeared.
- The US Reforestation Trust Fund provides \$123 million annually for reforestation.



Low Carbon Energy

- Storage. In 2010, the US had seven operational battery storage systems (or about 21 MWh of energy capacity); by the end of 2018, the US had 125 operational battery storage systems.

(insert: utility-scale battery storage - capacity and additions.)



- Nuclear. Nearly all of the 10 million metric tons of hydrogen produced in the US annually comes from converting methane from natural gas into hydrogen, a process that also releases carbon dioxide. However, a number of nuclear sites are converting hydrogen by running an electric current through water.

- **Cost crossover:** there is about 179 gigawatts (GW) of coal-fired power that is more expensive to operate than if it were replaced with local solar or wind energy.

- **Wind,** a historical comparison: **the total amount of power produced by wind energy on an annual basis today (2.7 quadrillion Btu) is nearly the same as the amount of wood-fired power that was consumed annually throughout the mid- to late-1800s.**

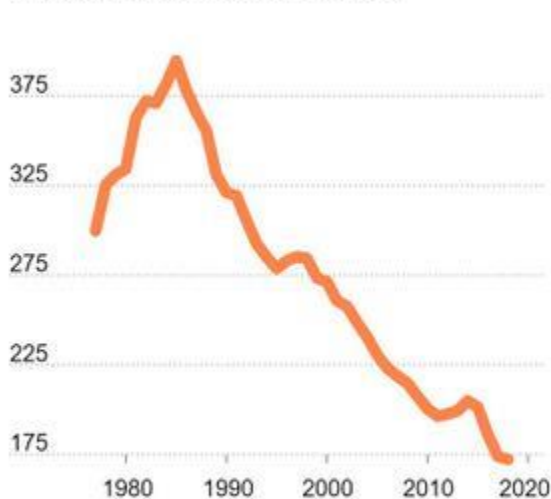
Policy

- The US Federal Reserve is operating a \$600 billion "Main Street" lending program. Oil and gas trade associations lobbied to make the lending program work better for them - mainly, allow borrowers to use the money to pay off old debt (Sen. Ted Cruz, R-Tex). Yet, **only 13 companies are receiving support from the program and only one is in the energy sector.**

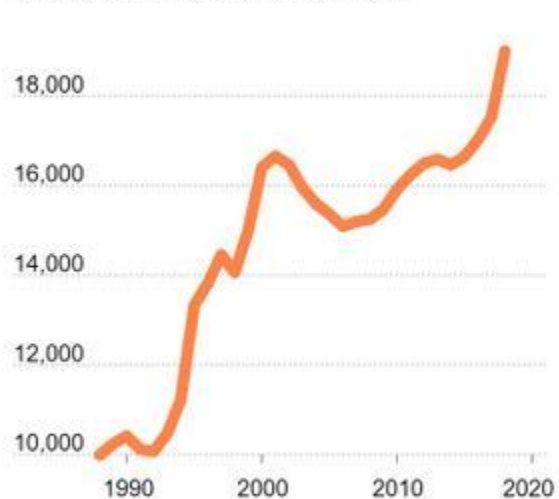
- **Featured:** California's oil economy is receding (declining consumption, restrictive emissions policies, etc.). **Yet, state policy-makers still face a number of hurdles** as they try to decarbonize the energy economy:

- About 35,000 oil and gas wells sit idle in California.
- After five years of inactivity, there is a 25% chance an idle well will re-enter production.
- The average per-well cost for capping and dismantling an orphan well in California is between \$40,000 and \$152,000, whether in a rural or urban area, respectively.
- The average value of a bond posted to pay for cleanup of an orphan well is about \$230. (So, there is \$110 million in the cleanup fund to cover \$6 billion in remaining costs.)
- In general, reduced in-state production has increased consumption of imported oil.

Oil produced (millions of barrels)



Wells idle for eight years or more

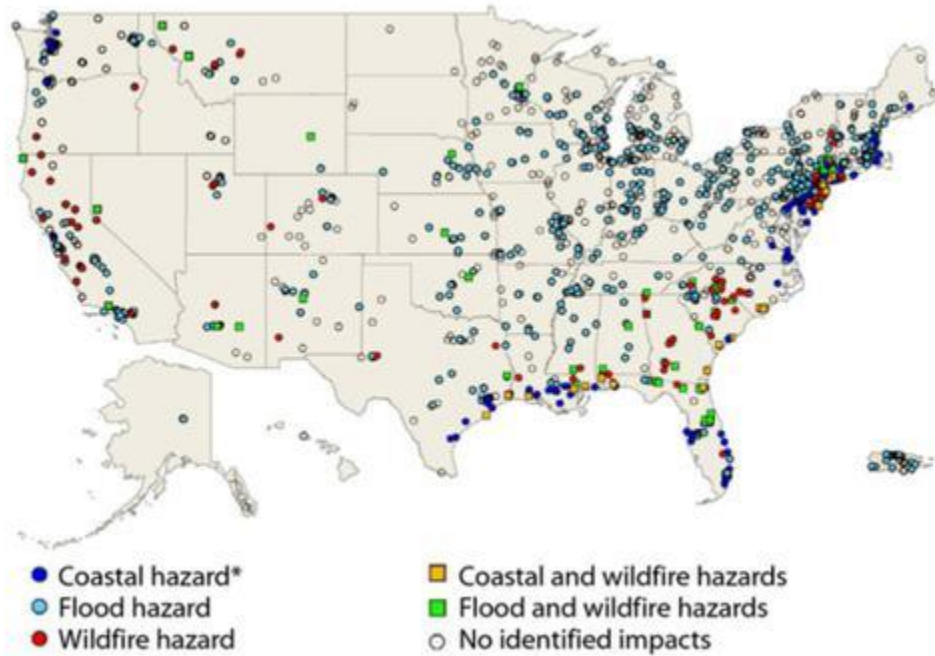


- **Beltway Buzz:** The US Department of Energy (DoE) will **reopen its Arctic Energy Office in Alaska**, as the Trump administration seeks to increase US influence in the Arctic. The new DoE office will be located on the University of Alaska's Fairbanks campus.

- A current US **regulation restricts the flow of water in all showerheads to a maximum 2.5 gallons per minute.** The Trump Administration has asked the DoE to publish a proposed rule that would increase the flow of water.

Climate and Sustainability

- *Special report.* **The changing climate has increased flooding risk, which puts many toxic Superfund sites at risk** (*insert: at-risk Superfund sites, by risk type*).



- In Baghdad, Iraq, the temperature reached 125.2° (F) in late July; in the past five years, **Iraq has been 4.1° hotter than the country's average temperature** at the close of the 19th century.

- Until recently, **climate-modeling analysts did not account for carbon dioxide emissions associated with their own computer modeling activities.** AES Friends have access to a peer-reviewed [publication](#) about emissions and climate modeling (Summary: modern society is good at obscuring the environmental impacts of its activities.)

- Between 2012 and 2017, **about 5% of all trees in California died**, primarily as a result of severe drought and increased density of pests.



Research to Markets

- A new method to fabricate perovskites as single-crystal thin films results in fewer defects, greater efficiency, and enhanced stability, which could lead to increased use of perovskites in all solar devices (cells, LEDs, photodetectors, etc.). AES Friends have access to the [peer-reviewed research](#).

- **Spotlight: Automobile transportation in the US:**

- The average age of cars and light trucks has been increasing for the last 20 years (due to rising prices for new vehicles and improved durability).
- The US has more than 280 million vehicles on the road.
- The average age of cars, sport utility vehicles and pickup trucks in the US rose from 11.8 in 2018 to 11.9 years in 2019 and will probably reach 12 years in 2020.

- **Alphabet Inc. (aka Google) issued \$5.75 billion in sustainability bonds**; it is the largest "green bond" ever issued by any company.



- 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.

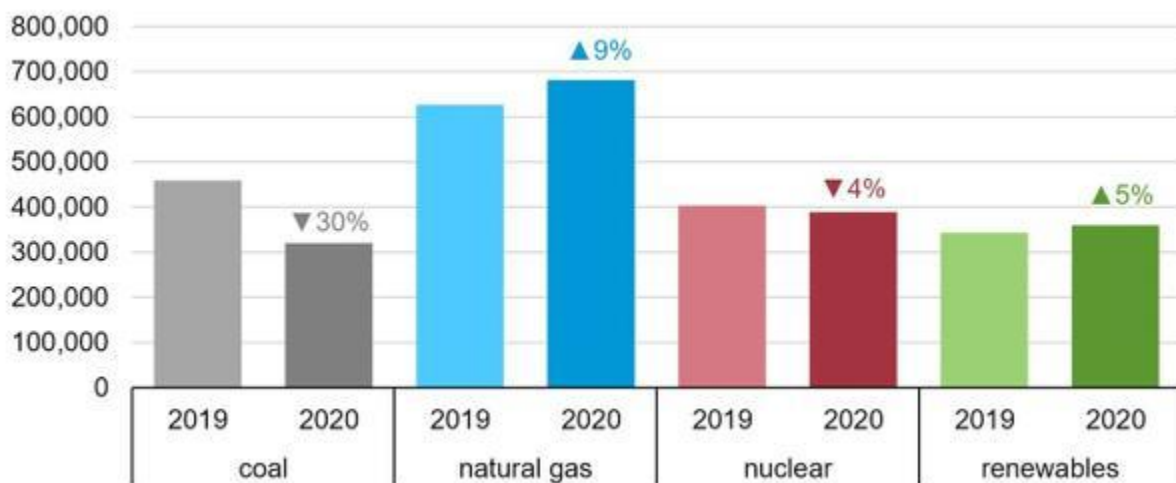
- ESG investing refers to three factors used to measure the sustainability and societal impact of an investment: Environmental, Social, and (Corporate) Governance. Some believe these criteria help better determine the future financial performance of an investment. **A brief survey of the ESG financial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



Electricity, Power and Efficiency

- **Sources of power, first half of 2019 vs. 2020, in gigawatt hours (insert):**



- **Energy consumption in the US has dropped to its lowest monthly levels** since December 2001, after the September 11 terrorist attacks shocked the economy and a mild winter depressed electricity demand.

- *Cybersecurity spotlight for the power sector*: The Federal Energy Regulatory Commission (FERC) and North American Electric Reliability Corporation (NERC) published a **cybersecurity guide for the power sector**, which covers four noninvasive techniques that CISOs can use to identify chips produced by Huawei and ZTE. AES Friends have access to the **guide**.



Quotes: *Water Works*

"You take a shower; the water doesn't come out." - US President Donald Trump on current shower-flow regulations.

"[The new standard] will allow for really big showerheads with multiple nozzles." - Andrew deLaski, executive director of the Appliance Standards Awareness Project objecting to changes in the regulations.

"Frankly, no one wants it. No one asked for it. No one cares." - Scott Paul, President of the Alliance for American Manufacturing, referring to controversies surrounding shower-head flow.