

Energy Matters

March 2, 2020

An official e-publication of:



AMERICAN
ENERGY
SOCIETY

Sound-bite summaries of the energy news you need to know.

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Fossil Fuels

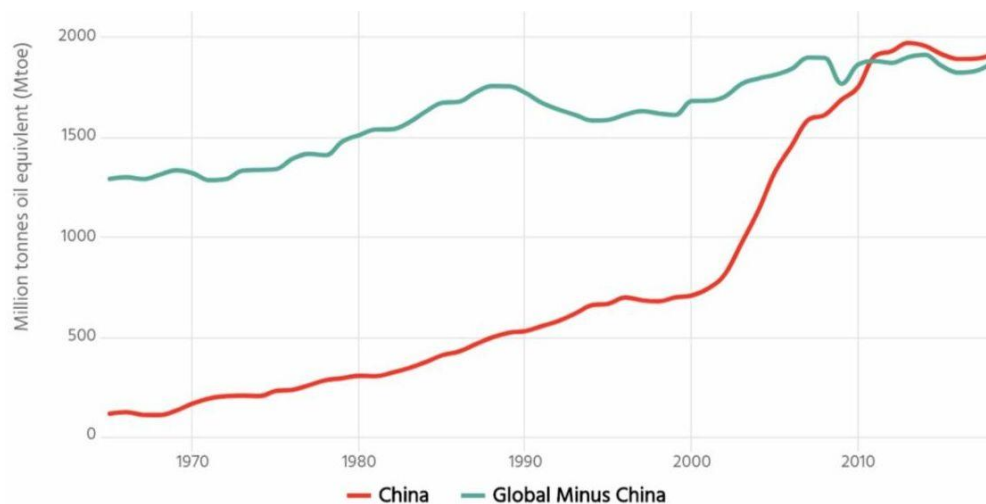
- Oil, *featured story*: It appears that a bizarre balance of chaos has created a somewhat stable oil market, at least in the short-term, with both demand growth and supply growth slowing. The Coronavirus outbreak has slowed **global demand for oil** (e.g. Chinese refineries have **cut** processing by 25%); meanwhile, there has been a significant increase in the number of **US refineries that have restricted supply**:

- Bayway refinery operated by Phillips 66 in New Jersey ([pollution restrictions](#))
- Philadelphia Energy Solutions refinery ([bankruptcy](#))
- Exxon's Baton Rouge refinery in Louisiana ([fire](#))
- LyondellBasell Industries gasoline refinery units ([repairs](#))
- Shell's Convent refinery in Louisiana ([flash fire](#))
- Marathon Petroleum's Galveston Bay refinery ([ongoing inspections](#)).



- Natural gas. **Prices are at the lowest levels since 2001**, in real terms.

- **Coal**. Over the last two years, **China has added 43 gigawatts of coal-generated capacity**, or about the same amount of power consumed by Germany every year. China consumes as much coal as the rest of the world combined.



- **Editor's note:** It appears that the COVID-19 outbreak has hurt fossil markets (oil, gas, coal) more than renewables; however, the weather has had a greater effect on natural gas and coal inventories than the pandemic. January 2020 was the fifth warmest on record, with an average temperature of 35.5 degrees F across the US, or about 5.4 degrees warmer than the 20th Century average. In short, **people don't need as much power to heat their homes ... but they will need air conditioning this summer.**

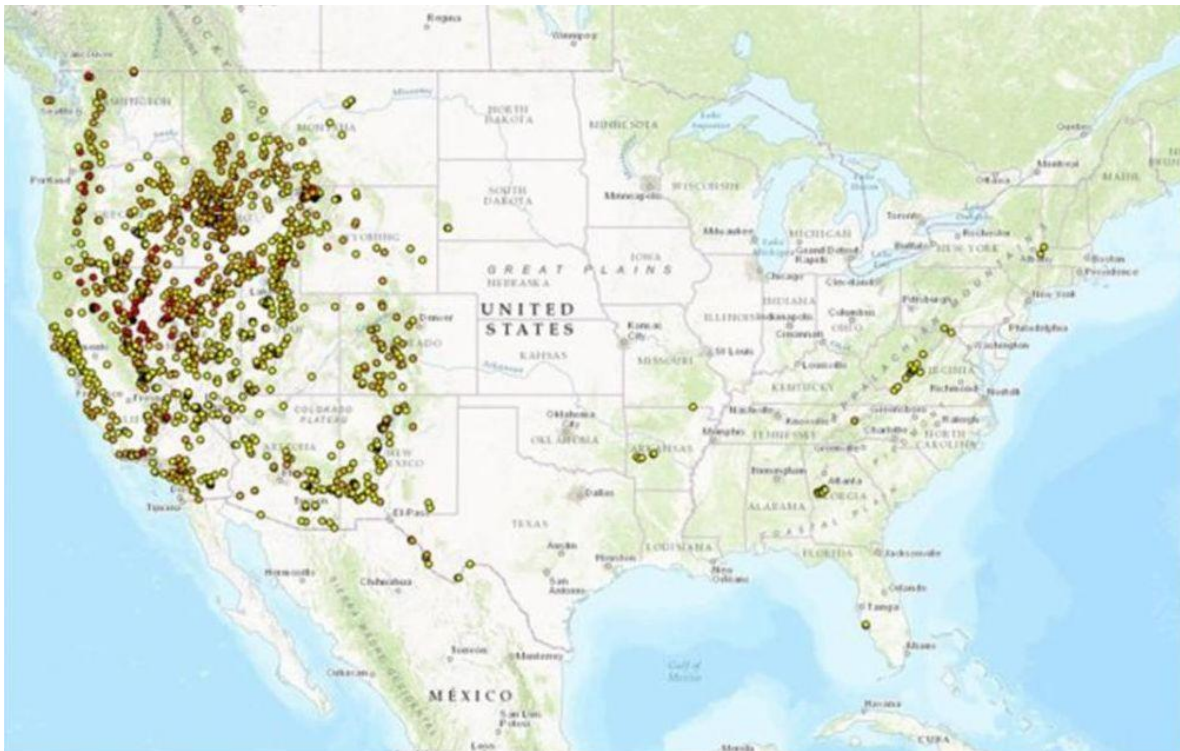
- Carbon Capture. In early 2018, **Congress provided a tax credit of \$20 per metric ton of captured carbon**; however, the tax code left some issues unresolved, such as the definition of "construction start-date", or the carbon capture equipment eligible for credit. AES Members have access to a true and correct PDF copy of the new [IRS Notice](#).

Low-Carbon Energy

SPOTLIGHT: GEOTHERMAL AND RARE EARTH ELEMENTS (i.e. lithium)

- A number of [teams](#) are having **success recovering high-value rare-earth elements from geothermal fluids** or "brine" produced in the Earth's subsurface. AES Premium Members have access to [peer reviewed research](#) on the extraction of Rare Earth Elements from geothermal brines.

- **The US has 2.5 gigawatts of operating geothermal capacity**, about [half](#) of which came online in the 1980s. Most geothermal capacity is in the western US (insert).



- It takes about **70,000 liters of water** to mine a single ton of lithium . (Note: lithium is usually found in the world's driest locations, like Chile's Atacama Desert. Bolivia also has significant lithium deposits, but weather conditions limit mining opportunities.)

- EnergySource, a geothermal energy company, can [extract](#) lithium from the **Salton Sea in California** — one of the world's most powerful natural geothermal hot spots.

Policy

- *Featured story:* [BP](#) is leaving three US energy trade associations, including the main refining lobby group, the American Fuel and Petrochemical Manufacturers (AFPM), due to differences over climate policies. Last year, [Shell](#) left the AFPM because of 'material misalignment' in climate-related positions.

- **The number of countries that have [biofuel policy mandates](#) in place, by region:**

- 14 countries in the Americas
- 12 in Asia-Pacific
- 11 in Africa and the Indian Ocean
- 2 from non-EU countries in Europe.

The most significant biofuel markets are: US, China and Brazil.

- **The Arizona legislature approved, and the governor signed, [legislation](#) to prohibit local city governments in the state from passing their own bans on natural gas**, like Berkeley has done in California, Brookline, Massachusetts, and Takoma Park, Maryland.

- *Beltway buzz:* There are rumors that **Senate Energy Chair Lisa Murkowski and ranking Democrat Joe Manchin will introduce an energy legislation package this week**. Watch the [AES website](#) for updates.

- As per expert Member, Rob King, AES editors recommend the [remarks](#) by **2020 Houston Partnership Board Chair Bobby Tudor**, Chairman of Tudor, Pickering, Holt & Co., about the coming energy transition for the oil and gas sector and Houston.

Climate and Sustainability

- **The tragic toll on human life aside, measures to contain Coronavirus have [lowered](#) China's CO2 emissions by 25%:**

- Coal use at power stations is at a four-year low.
- Oil refinery operating rates are at the lowest level since 2015.
- Output of key steel product lines is at the lowest level in five years.
- Levels of NO2 air pollution over China are down 36%.
- Domestic flights are down approximately 70% compared to last month.

- **Emissions from methane leaks could be 25 to 40% higher** than previously thought, perhaps by 'a factor of ten.' AES Members have access to the [study](#).

- **Global CO2 emissions from energy [did not climb](#) in 2019**, while the world's economy grew by 3%. (Note: the EU was the biggest reducer of CO2 emissions, with Germany's 8% decrease the largest of the OECD countries.)

- Of the 136 largest coastal cities, **the 3 most at risk** (visit the [AES website](#) to see the full Top-10 list):

1. Guangzho, China
2. Miami
3. New York

- Related, Barcelona, San Diego, Boston, and Nottingham officially declared climate emergencies. **Globally, there are [1,330 binding motions](#) declaring a climate emergency** by various local, state and regional governments.



Research and Markets

- Request for Proposal ([RFP](#)) for **developing a Uganda Energy Mix Diversification Strategy** for the Uganda Electricity Generation Company. Closing date of RFP: March 20, 2020. All questions related to this RFP should be submitted via email by March 13 to [Elise Voorhis](#), Senior Program Coordinator.

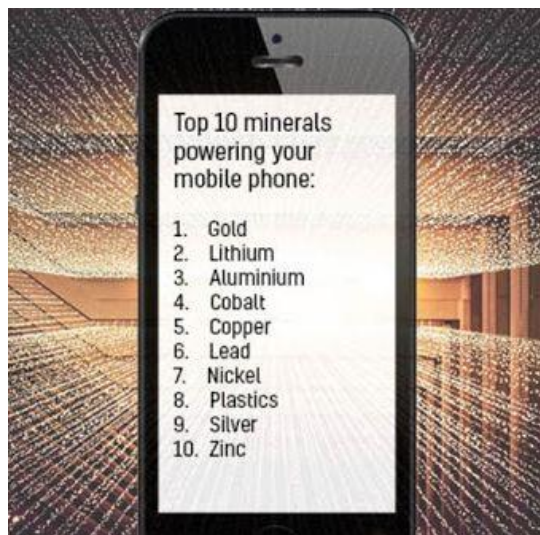
- Baker Hughes [bet big on digital oil and gas](#) and curbed its exposure to price volatility by exiting shale. It turns out that Baker Hughes was the only one of the Big Three oilfield services companies that turned in a profit for 2019.

- The search for advanced batteries that offer features like superior energy density or extra-long battery life has led to designs like bendable batteries that mimic the human spine, to breathable nanochain structures. There is possibly a new technology that uses [nanowire-sprouting bacteria](#) found in the muddy sediments of the Potomac River. These **bacteria produce conductive protein nanowires that can generate an electrical current directly from water vapor in the atmosphere.**

ENERGY TODAY

In case you missed it, Energy Today:
[Rare Earth Elements.](#)

Today's obsessive pursuit of natural resources is part of a centuries-long scientific quest to identify and understand the elements that make up the earth.



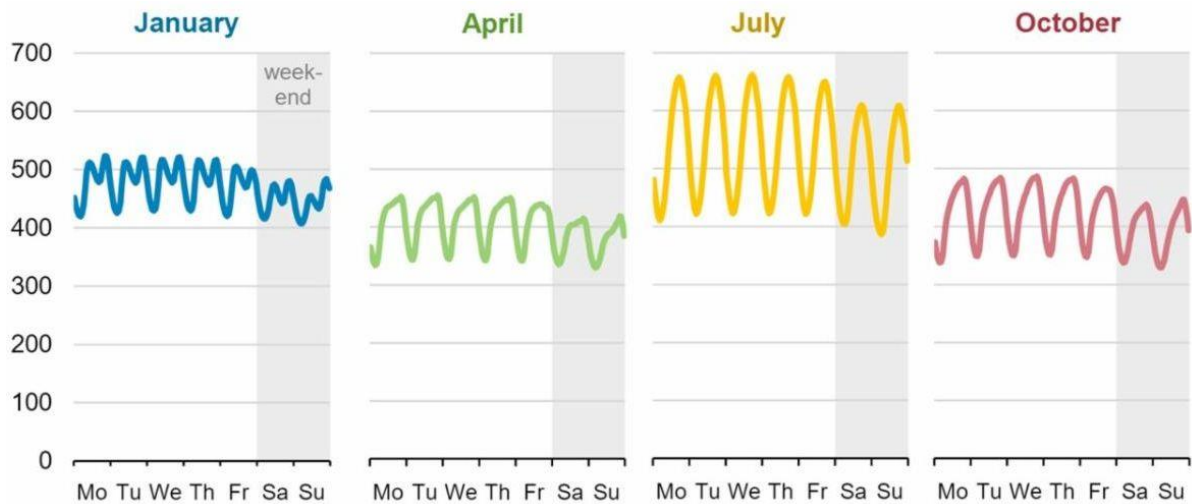
- China, the world's biggest market for EVs, has about [eight public chargers for each one](#) in the US.

- A number of professional accounting associations are asking their members to [integrate](#) climate risk into their company audits.

- A new peer-reviewed study shows that **polystyrene, one of the world's most ubiquitous plastics, may degrade in decades or centuries** when exposed to sunlight, rather than thousands of years as previously thought. AES Premium Members have access to the [article](#).

Electricity, Power and Efficiency

- Hourly electricity consumption [varies](#) throughout the day and season in the US . (Insert: Avg. hourly electricity load during a typical week, select months, by million kWh).



- The proposed federal budget would [sell off](#) two federally-owned power projects: **Tennessee Valley Authority and the Bonneville Power Administration**. (Note: Almost 20 million electricity customers are served by BPA in the Pacific Northwest and TVA in the Southeast.)

- If electric vehicles reach 10% market penetration, and if a majority of owners charge their cars at night (consistent with trends today), then **residential peak load would shift from day to night** , and the cars' batteries would become ["stored energy."](#)

- Bitcoins are mined by computers. Some of those computer server farms are in locations with access to low-cost electricity. **Iceland uses [more electricity](#) to mine bitcoins than to power its homes.**



Features

Spotlight: Professional Development

- **Stanford University is offering Understanding Energy online this spring quarter** ("[CEE 207A: Understanding Energy](#)", March 30 - June 3. Enrollment takes place between Feb 9 - March 16, 2020. Tuition for the course is \$3,900. Students who complete the course will receive 3 units of credit.
- Jet Blue is looking for an [Investment Associate](#) to work in San Carlos, California.
- Halliburton is hiring for a number of positions, including an [Associate Real Time Services Specialist](#), in Houston, Texas.
- On April 24th and 25th, Powerhouse will host its annual [SunCode Hackathon](#), the biggest clean energy hackathon in the country.
- [Innovation in Unconventional Drilling Conference](#), March 19, 2020, by the Mays Innovation Research Center and the Energy Institute at Texas A&M.
- [CyberCon](#), cybersecurity for the power sector, March 30 - April 1, Anaheim, Calif.

Quotes - Some things are better left unsaid ...

"If you go too fast and you don't get it right you can drive yourself out of business."

- BP's outgoing CEO Bob Dudley, warning Big Oil of moving too fast investing in new technologies to counter climate change, because failure could lead to financial ruin.

"It is time for a sustainable energy policy which puts consumers, the environment, human health, peace, justice, equality, and fairness first."

- Dennis Kucinich, former Member of the US House of Representatives.

"It's about putting American energy and American industry ahead of the environment."

- US Vice President, Mike Pence