

Energy Matters

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An official publication of



From the President of the American Energy Society

If you need anything professionally, just [ask](#) (*my direct email*). For instance, we have a number of small projects that offer a paid honorarium. We have delayed launch of our new website in order to make sure we take care of our Members.

We have to isolate, but no one is alone. If you don't ask, we can't help.

- [Eric J. Vettel](#), Ph.D.
President, American Energy Society

p.s. During these unprecedented times it is more important than ever for professionals to have access to unbiased, impartial and trusted information. During the pandemic, all publications by American Energy Society will be complimentary. Please share this newsletter with colleagues and encourage them to [join](#) the Society.

We miss you - [let us know](#) what we can do to provide better professional support.

Fossil Fuels



Oil: It appears that a virus rather than geopolitics has [weakened Saudi Arabia's control of oil markets](#). The Saudis underestimated the effect coronavirus would have on demand and overestimated their fiscal buffer. The country is reducing government expenditures by US\$13.2 billion (50 billion Saudi riyals), or nearly 5% of its budget; however, Saudi Arabia's finance ministry asked the government for a 20-30%, and to balance its budget, Saudi Arabia [needs oil prices](#) at \$91 a barrel, all else being equal. Meanwhile, Russia announced it will add another 500,000 barrels of oil per day to the market.

Natural Gas: Remarkably, [natural gas prices have fallen into the \\$2 range in Europe](#) (\$2.91 per MMBtu at the Dutch trading post; \$2.88 per MMBtu at the British post). The primary cause has been the impact of the coronavirus on demand. Moreover, LNG export capacity continues to grow. It appears that prices are falling so low that the last of the coal-fired power plants in Europe are making the final switch to gas.

Coal: At the onset of COVID-19, many countries immediately increased [coal imports](#); for instance, China imported 68.1 million mt of coal while the virus peaked for two months. Since then, **many ports have [refused to allow coal vessels to dock](#)**. Those that do require testing of all crewmen and some order vessels into quarantine if one crew member tests positive for COVID-19. Buyers have terminated contracts because the vessels were not allowed to unload.

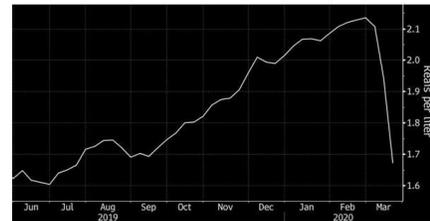


Carbon Capture: Soil stores about 5 Gt of CO₂ per year, or about 1/4th of the world's total. Consequently, repairing soil carbon storage could be a decarbonization solution that also provides other benefits — improved air, water, fuels, biodiversity, agriculture.... AES Members have access to a [peer-reviewed paper](#) about soil carbon.

Low-Carbon Energy

- **Featured story: When oil is around \$60 per barrel, fossil-fuel companies tend to invest in renewable energy and carbon mitigation strategies;** however, in response to the twin challenges of COVID-19 and low oil prices, the world's oil and gas industry has [slowed investment](#) in all renewables. For instance, oilsands company Suncor Energy in Canada announced it will cut its 2020 capital budget by 26% or \$1.5 billion - and virtually all of its "sustainability" budget.

- Long before the pandemic emptied roads and exacerbated an oil price war, biofuel producers were battling chronic oversupply and trade upheaval. Now slumping demand and prices mean **smaller biofuel producers and those with heavy debt loads are struggling** to ride out the losses. (*Insert: ethanol prices at the Sao Paulo, Brazil, trade center.*)



- California finalized plans to [demolish four hydroelectric dams on the — improved Klamath River](#) (project cost: \$450 million USD). Since 2012, about 1,700 dams have been dismantled in the US — this demolition project would be the largest.



- **A by-state comparison of "net-metering electricity prices" and "rooftop solar capacity" in two images.** (*Editor's note: do not confuse correlation and causation.*)

Net-Metering
Average Retail Electricity Prices



Rooftop Solar Capacity
(per capita)



- There is currently only one operating commercial offshore wind farm in the US (the [Block Island Wind Farm](#) launched in 2016 off the coast of Rhode Island), but **there are about 30 projects in the development pipeline**. Most of these proposed projects are stalled right now.

- India [canceled](#) development of two tidal power plants in Gujarat and West Bengal because costs were 10 to 20 times that of solar and wind energy projects.

Policy

- *Featured policy:* The massive relief bill – [the CARES Act](#) – has several provisions that may help energy-related companies. The bill's overall intent is to tide Americans over for the next four to six weeks. The \$2.2 trillion in relief is about 10% of US GDP. Another bill will be needed if the economy declines more than 10%. With the Senate in recess until April 20 and the House out for an indefinite period, another bill is [unlikely](#) before May.

- *Related, Congress did **not** appropriate \$3 billion to refill the Strategic Petroleum Reserve, nor did it extend tax credits for clean energy.*

- The coronavirus pandemic has delayed sessions in at least half of state legislatures. In terms of energy policy, it appears that the issues getting **bypassed are, in order: solar, grid upgrades, and 100% clean energy plans.**

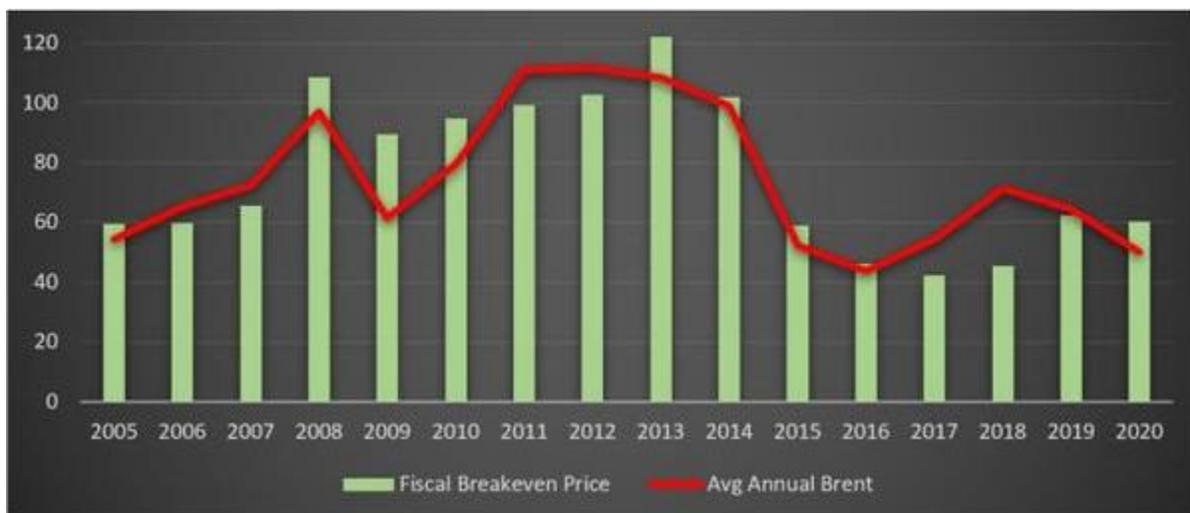
- The EPA announced that it **does not expect power plants, factories or any other company to meet environmental standards or report on their emissions during the pandemic** — and it won't pursue penalties if a company breaks the rules. AES Members have access to the "[Enforcement Discretion](#)" policy.

- *Featured update:* The Trump administration completed its [revision](#) of the Safer Affordable Fuel-Efficient (SAFE) Vehicles rule. The updated SAFE rules **mandate that automakers increase the fuel economy of passenger cars by 1.5% each year**; in contrast, the standards set by President Obama mandated a 5% annual increase in fuel economy.

- *Related, Volvo, Ford, Honda, Volkswagen and BMW have [agreed](#) to maintain stricter-than-federal vehicle emissions rules. (AES receives no compensation for this or any story.)*

- *Recommended article:* a new [op-ed](#) by former Secretary of Energy, Ernie Moniz.

- Iraq's 2020 budget was its largest in history, but oil in the \$20/barrel-range has forced massive spending cuts. **Iraq is now on the brink of civil war.** (Insert: Iraq's fiscal break-even, pre-coronavirus.)



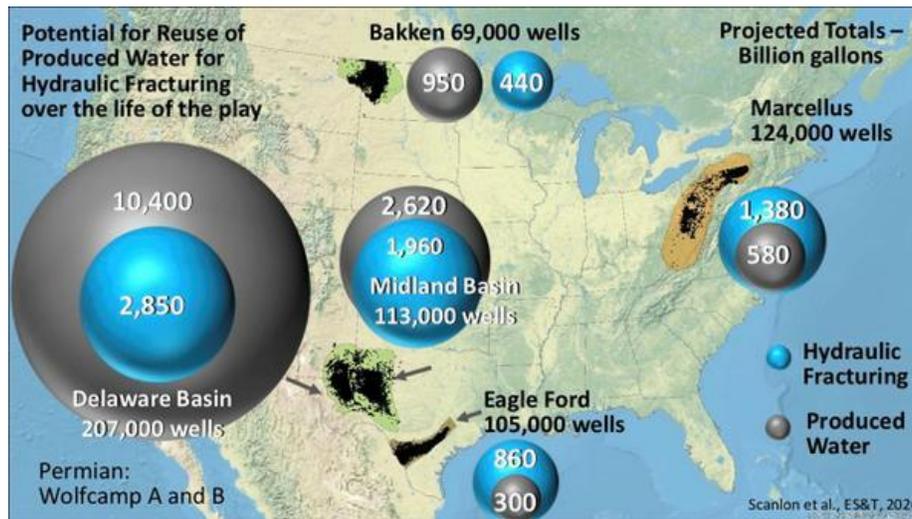
Climate and Sustainability

- The world is drowning in trash, especially municipal solid waste. The following is a list of the **top-4 trash producing countries in the world** (per person per day). Visit the [AES website](#) for a list of the ten countries that produce the most trash and access to the World Bank's study, "*What a Waste*." You may also be interested in the article, "[Plastic Do-Over](#)", in *Energy Today*.

1. Monaco - 7 pounds (per person per day)
2. Puerto Rico - 6.2 pounds (pppd)
3. Bermuda - 6.1 pounds (pppd)
4. Moldova - 5.7 pounds (pppd)



- **Reuse of water during hydraulic fracturing would minimize** adverse environmental impacts. (Insert projected total amount of water that could be reused by play, in billion gallons.)



- On April 7, the Center for Environmental Policy at Bard College is coordinating **55 university-hosted webinars** to discuss state and local climate policies and advocacy.

- *The Power of Community*, is a powerful documentary about Cuba's "special period" right after the collapse of the Soviet Union. The Soviets had been subsidizing Cuba's energy ecosystem, and as a result the Cuban economy was built on cheap oil. When the Soviet Union collapsed, **the Cuban people had to quickly give up their regular lives, create new social habits, and scramble to adjust to a new reality.** (Sound familiar?)

Research and Markets

- "**Hydrogenation**" *noun*, def: a chemical reaction in which oxygen atoms in carbon dioxide with hydrogen atoms to yield hydrocarbons like methane (the primary ingredient in natural gas). AES Members have access to an [article](#) about hydrogenation research at USC and NREL.

- There are 28 states that **charge** from \$50 to \$200/year for plug-in electric cars, and 14 states have annual fees for plug-in hybrids that also use gasoline. **The fees are meant to make up for the fact that electric-vehicle owners don't buy gas and thus don't pay gas taxes** that states rely on for road work.

- *Special report: The autonomous car revolution stalled* in part because technology designers could not determine if Radar, LiDAR, or cameras were the better visual-sensor system. It appears that the best solution is an integrated subsystem of all three solutions. Visit the [AES website newsfeed](#) for a deeper dive into the integration of these three solutions.



- An HBS study from 2010 looked at several recessions and found that companies with the highest likelihood of flourishing after a recession were those that **invested in longer-term operational changes** instead of taking temporary measures to ride out the market. AES Members have access to the [HBS study](#) as well as a [follow-up study](#) that also found these same companies continued to invest in technology even during the recession.

- *Recommended:* A [webinar](#) on the DoE "Office of Fossil Energy" - new "Advanced Energy Storage Program."

- Featured opportunity: [CalTestBed](#) is seeking applications from entrepreneurs for prototypes ready for testing and validation. Deadline is April 8. (*Note:* the team must have a California-based participant in order to be considered.)

- *One of many ...* Whiting Petroleum Corp., a major Bakken oil producer, is filing for Chapter 11 [bankruptcy](#) - according to the company, oil in the \$20-range is too low.

Electricity, Power and Efficiency

- The US consumes about 100 quadrillion BTUs per year. AES expert Members estimate that isolation in response to the coronavirus could reduce consumption by about 15 quadrillion BTU. Although the cost depends on the energy source (from about \$17 to \$30/million BTU), one million BTU costs about \$25. So **not using 15 quadrillion BTU could mean not spending close to \$400 billion on energy** in only three months as a result of this pandemic.

- On the other hand, according to [Cisco's Visual Network Indicator](#), the world has about 5 billion internet users who have 28 billion fixed and mobile personal devices and connections. Prior to COVID-19 pandemic, global IP traffic was projected to reach about 5 zettabytes per year by 2022. However, **in response to shelter-in-place, internet traffic is surging**, which means the world will probably reach 5 zettabytes much sooner.

1 zettabyte = 1 000 000 000 000 000 000 000 bytes

- **Many states are taking steps to ensure that there are no power-outages that will cause cascading problems during the shelter-in-place response to COVID-19.** For example:

- NYPA, New York's largest utility, has [re-instituted](#) emergency measures that were used after Superstorm Sandy in the fall of 2012.
- The 2,000-megawatt Ravenswood Generating Station has curtailed the number of employees at the plant from about 100 on-site to 43.
- Some utilities have stocked several months' worth of food and made cots available for staff to live on-site for two weeks at a time if that becomes necessary.
- On the other hand, no nuclear power plants have reduced staffing.

- **Pacific Gas and Electric pleaded guilty** to 84 counts of involuntary manslaughter and one count of unlawfully starting a fire in connection with the 2018 Camp Fire in Butte County, California, that destroyed the town of Paradise and killed 85 people.

Quotes - questions from AES Members...

AES Members are asking very thoughtful questions that don't yet have answers. Most of the questions fall into one of five categories:

1. In light of the global pandemic, will we see another spike in nationalism and anti-globalization?
2. What will happen to global coordination on issues like climate and global trade if the world is more isolated?
3. Will OECD countries continue to subsidize decarbonization efforts in under-developed regions in the world?
4. Will the world continue to rely on a single country (China) as the manufacturer of so many mission critical elements of the supply chain?
5. Does energy security and energy independence take on greater importance, or do definitions change?

One more note from the desk of the Editors: Remain vigilant for yourself and others around you. Support your neighbors and help those in need when you can.

And remember, ***this too shall pass.***