

Energy Matters

July 20, 2020

An official publication of



News from the Society

Success! The 10th annual [SISE](#) conference ...
Sustainable Infrastructure and the Gigaton Challenge

- Thank you co-hosts, especially George Crabtree and Thomas Aláan at the University of Illinois, Chicago.
- Thank you to all the speakers for outstanding, meaningful presentations.
 - [recorded](#) presentations are still available:
 - Former US Secretary of Energy, Steven Chu
 - Former Deputy Secretary of the DoE, Dan Poneman
 - Melanie Kenderdine, Principal at Energy Futures Initiative
 - Chris Gould, Chief Innovation and Sustainability Officer at Exelon
 - United Nations SDSN and Evolved Energy Research
 - Dr. MK Dorsey
 - Jason Blumberg, CEO of Energy Foundry
 - Amy Francetic (Buoyant Ventures), Erik Birkerts (Clean Energy Trust), and Jim Schulte (Exelorate Growth, Exelon)
 - The Canadian Consulate
- We are grateful for the support of Exelon - Thank you.
- *And in recognition of the great work of the Fellows!* (Especially their contributions to the [beta-maps](#) of energy ecosystems in the Midwest.)
- A forthcoming issue of [Energy Today](#) will summarize the presentations and report on the winners of the Exelon Achievement Awards.
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Notice to all Members: If your membership is current, we will soon send out credentials that provide full access to the [restricted](#) sections of the website.

Fossil Fuels

Oil: *Spotlight Saudi Arabia/US: In early March, Saudi Arabia flooded the market with oil after the collapse of the OPEC+ deal.*

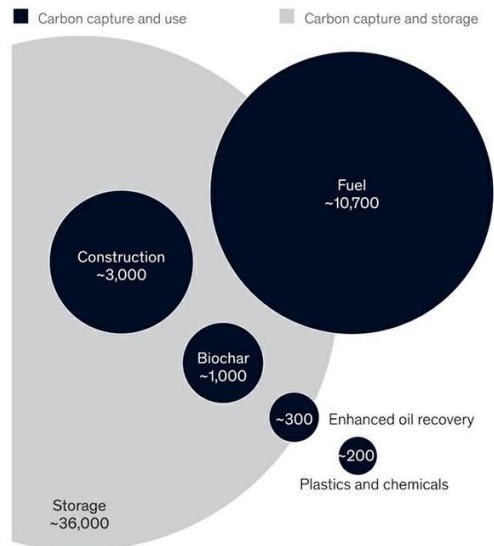
- Saudi Arabia exported a [record](#) 10 million barrels per day (bpd) in April, up from 7 million bpd in March; production also jumped in April to over 12 million bpd.
- One month later, Saudi Arabia reduced its oil production to 8.5 million bpd in May and June under the new OPEC+ deal.
- On June 1st, the US rig-count dropped to 301 (Note: during the worst of the 2014–2016 oil bust, 404 rigs were operating); US producers cut supply by about 2 million bpd.
- However, recovery of oil prices to around \$40/barrel makes some shale output profitable again: low-cost plays in Texas have resumed production, while expensive shale basins in North Dakota and Oklahoma still struggle at 15% of usual output.
- Overall, US shale producers have [restored](#) half a million barrels per day (bpd) of crude output since the collapse.

Natural Gas: Russia is building *Siberia-2*, another [natural gas](#) pipeline to China.



Coal: COVID-19 has had an [impact on all mining](#), broadly defined. About 275 mining operations around the world have been suspended during the pandemic. The Latin America region was the most impacted: Peru, Chile and Mexico were the top-3 countries with the highest "at-risk" operations.

Carbon Capture: Carbon capture. The estimated technical potential of short- to medium-term CCUS development in metric megatons of CO₂/year, by 2030 (insert). AES Friends have access to the [report](#).



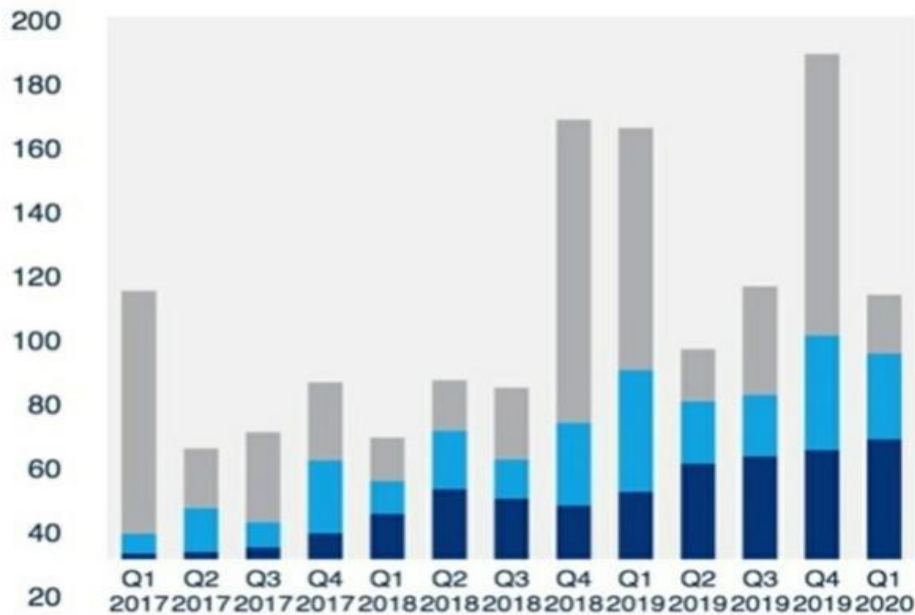
Low Carbon Energy

- Spotlight: wind energy

- [Wind energy](#) accounts for about 7% of all electricity generated in the US.
- Most wind power generated in the US comes from Iowa, Kansas, Texas and California.
- Twelve countries in northwestern Europe have about 5,000 offshore turbines; the US has five utility-scale — all off the coast of Rhode Island.
- Tractebel Engineering, a part of energy major Engie, has developed a [power-to-gas offshore platform](#) that converts wind energy to hydrogen, which stores the energy to compensate for seasonal fluctuations in output from renewables.
- **Supersized wind turbines can deliver \$4-5/MWh more in grid benefits than current turbine technology**, or \$6/MWh in direct-cost advantages. The benefits largely come from the increased capacity that larger rotors and taller towers enable and the fact that such supersized turbines tend to spread wind output proportionately over more hours. AES Friends have access to a special peer-reviewed report on [supersized wind turbines](#).



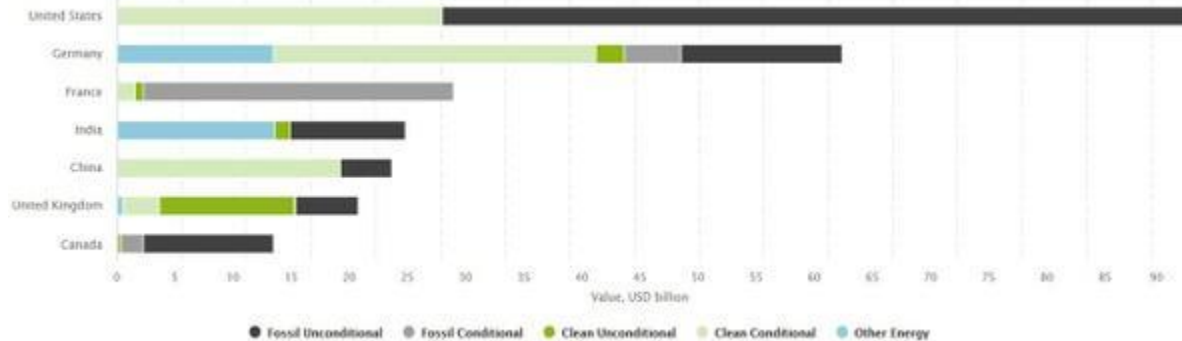
- The US [storage industry deployed](#) 97.5 megawatts in Q1 of 2020 (insert: quarterly storage deployments in the US, by deployment in MW).



Policy

- G20 government [COVID recovery packages](#) that support energy-intensive sectors (USD):

- \$151 billion for policies "supporting production or consumption of fossil fuels."
- \$89 billion for "clean" sectors like energy efficiency, solar and wind.
- \$30 billion to support climate targets or new emissions requirements.
- \$28 billion for "other energy," such as "biofuels and hydrogen of unspecified origin."



- It appears that the US Congress will pass the [Better Energy Storage Technology \(BEST\) Act](#), which will provide substantial funding for advanced storage research, development and deployment. AES encourages thought-leaders in this space to begin preparing for a FOA.

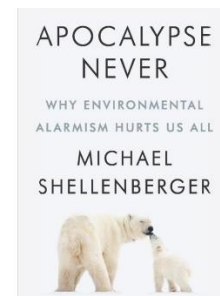
- Related, the DoE is seeking input from stakeholders about its [draft Energy Storage Grand Challenge roadmap](#), a strategic plan to develop and deploy the next generation of energy storage technologies.



Climate and Sustainability

- Recently reviewed satellite images revealed that in February 2018 an [explosion of a natural gas well](#) in Ohio (near the West Virginia border) released about **50,000 tons of methane into the atmosphere**, leaking more methane greenhouse gases in 20 days than the majority of many European nations do in a year.

- *Book jacket blurb:* Michael Shellenberger has been fighting for a greener planet for decades. But in 2019, as some claimed "billions of people are going to die," Mr. Shellenberger decided that, as a lifelong environmental activist and leading energy expert, he needed to speak out to separate science from fiction. **Mr. Shellenberger just published [Apocalypse Never: Why Environmental Alarmism Hurts Us All](#)**. (Note: AES Editors have not yet reviewed this book.)



- **Siberia is experiencing the [hottest temperatures over normal conditions \(+2° C\)](#) in the world** and is the strongest driver of the second warmest January - June half-year on record. (Note: the research has not yet been peer reviewed.)

- **Wildfire [smoke](#) may contribute less to rising temperatures than previously thought.** AES Friends have access to the peer-reviewed abstract summary of the research.

- **Burger King has rebalanced the diet of some of its cows** by adding lemongrass to their diet, which can reduce a cow's daily methane emissions by about 33%.



Research to Markets

- **Exelon has launched a new \$20 million Climate Change Investment Initiative (2c2i)** to support startups working on new technologies to reduce greenhouse gas emissions and mitigate climate change. The initiative will base its selection process on the following criteria:

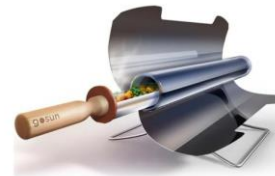
- The startup must be doing work in any/all six of Exelon's major urban markets: Atlantic City, Chicago, Baltimore, Philadelphia, Washington, DC, and Wilmington, Delaware.
- Innovations must have potential to either:
 - Mitigate greenhouse gas emissions;
 - Boost the resiliency of urban infrastructure (e.g., the power grid, transportation systems, buildings, vacant land) against flood, stormwater and rising temperatures;
 - Help cities, businesses and communities adapt to climate change;
 - Help achieve a state or city's specific sustainability and climate goals.
- Minority and women-owned businesses will receive particular consideration.

- *Recommended resource:* Clean Energy Trust is hosting a series of short, 75-minute [webinars](#) about regional energy ecosystems. First stop - Minnesota, on July 29. The webinars by CET focus on cleantech, but they are compatible with the **comprehensive [energy ecosystem maps](#) built by the American Energy Society**. [Contact us](#) if you are interested in the census data behind the AES maps (size of venture, MVP, POC, etc.).

- Lithium is a valuable rare earth mineral because it stores more energy by weight than other battery material; manufacturers use more than 160,000 tons of lithium for storage material every year. But lithium supplies are limited and concentrated in a handful of countries, where the metal is either mined or extracted from briny water. **Researchers at Seoul National University may have found a way to [pull lithium out of seawater](#).**

- New circular-economy home appliances:

- The [GoSun Grill](#) uses reflectors to focus the sun's light rays onto a metal tube that creates heat (up to 550° F) to cook food (insert).

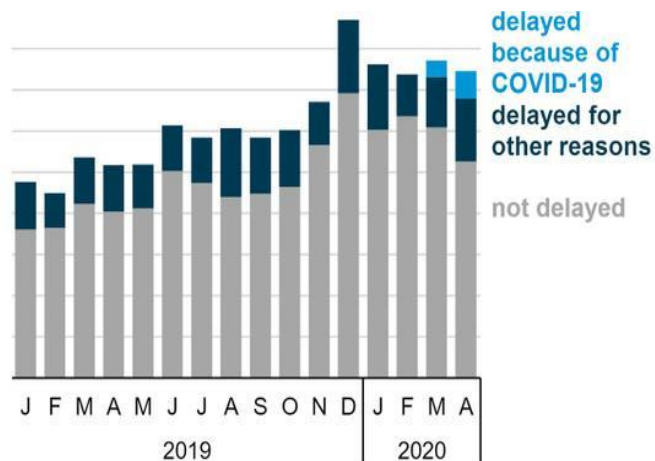


- The [HomeBiogas 2.0](#) uses bacteria to turn food-scrap waste into cooking gas.
- The [Ecocapsule](#) is a micro housing pod (bed, kitchen, bathroom, and storage space) that uses solar and wind energy for electricity and rain for drinking water.
- The [Hydralight](#) lantern uses charged particles from salt water to create electricity.
- The [Cinnamon System](#) is a solar-and-storage powered miniature electric grid.



Electricity, Power and Efficiency

- Due to the global pandemic and rolling shelter-in-place orders, **more utilities are delaying [construction](#) or [repair](#) of facilities and/or infrastructure.**



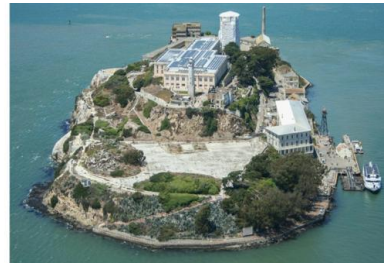
- Related, **due to the global pandemic and rolling shelter-in-place orders...**

- US [electricity demand](#) in May was down 7.5% (vs a typical 3% decline in May 2019);
- residential load is about 8% higher than normal;
- commercial and industrial demand is down 10% to 15%, depending on location;
- demand for natural gas has been resilient, with no strong or obvious changes.

- *Grid primer.* The US power grid is, by some estimates, the largest machine in the world. And despite its occasional well-publicized failures, it is remarkably reliable, delivering energy to almost everyone almost every second of every day. But the centralized grid is stressed, while smaller, smarter, demand-response technologies operate like "[virtual power plants](#)" at the local level. In general, **there are two types of "Distributed Energy Resource" (DER) models:**

- TSO: the logical extension of the current wholesale market system in which a lot more DERs are all optimized (balancing of supply and demand) in one central place.
- DSO: formally, a "decentralized, layered-decomposition optimization structure," this bottom-up model aggregates all DERs into a single unit that is sold to wholesale markets.

- **One of the biggest microgrids in the US** runs [Alcatraz](#), off the coast of San Francisco (*insert*).



Quote

"With prices where they are now, if they stay above \$30, I wouldn't expect any significant curtailments from us."
- Devon Energy Corp Chief Executive David Hager

"We were able to shut in thousands of wells with really minimal time and effort. And we can bring those back on with really minimal time and effort, too."
- EOG Resources Chief Operating Officer Lloyd Helms

"The coronavirus pandemic has done in a handful of months what a 27-year civil war did not — brought oil drilling to a halt in Angola."
- Sarah McLean, senior analyst at IHS Markit