

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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AMERICAN ENERGY SOCIETY

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News from the Society

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- In this issue of *Energy Matters* -

- **Electricity and the Grid:** The Texas electricity grid
- **Oil:** Meme short-stopping oil stocks (*insert*)
- **Low carbon energy:** Geothermal powers Nevis



Fossil Fuels

- Oil -

- **Meme oil stocks:** In January 2021, a short squeeze of the stock of video game retailer GameStop (NYSE: GME) had major financial consequences for certain hedge funds. It appears that **some short-sellers tried to do the same with some small- to mid-sized oil companies**. For instance, New Concept Energy saw a sharp reduction in short interest, followed by Ring Energy (both had a temporary 1,000% surge in the stock prices). Unlike GameStop, however, there was no discussion about the companies on Reddit, though there is some chatter about metals and mining as the next "short-stop" priority. (*Note:* Thank you AES expert member [Irina Slav](#) for the insight.)

- Natural Gas -

- **In the history of natural gas energy, LNG exports (usually shipping) have exceeded natural gas exports by pipeline only once - in April 2020. It happened again in November, 2020.** However, in April LNG exports exceeded pipeline exports by only 0.01 billion cubic feet per day (Bcf/d), whereas in November it was by 1.2 Bcf/d. (*Note:* it appears that US LNG exports will exceed natural gas exports by pipeline in the first and fourth quarters of 2021 and on an annual basis in 2022.)

- Coal -

- Despite the pandemic, **aggregate market value of the mining sector is \$1.94 trillion in 2020, up 30% since 2019 and 84% higher from March to December of this year.** Coal is the primary focus of the mining industry, followed by gold. But the mining sector is surging because the current energy transition has extraordinary demand for cleantech-related mining elements and minerals.

- Carbon Capture -

- Elon Musk tweeted that he will pay \$100 million in prize money for the best new carbon capture technology. Meanwhile, an international initiative, 1t.org, aims to restore and grow one trillion trees by 2030 to mitigate climate change; the campaign is run by the World Economic Forum and funded by the Marc Benioff Foundation.

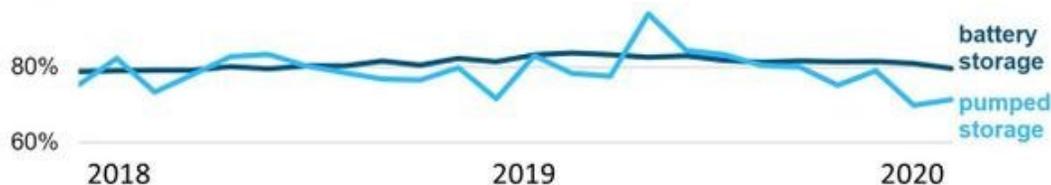
Low-Carbon Energy

- *Featured story:* For five decades, the island of Nevis in the Caribbean (population 11,000) imported diesel as the primary source of fuel to generate its electricity. Electricity costs constantly fluctuated with the market price of diesel, emissions were always high, and imports stopped with each hurricane. However, next year the island will never use diesel again - **Nevis is converting to geothermal** (project developers: GeoFrame Energy and Schlumberger New Energy).



- Most desalination plants use reverse osmosis to force seawater through salt-blocking membranes, but the process is expensive - electricity accounts for about half of the total cost of operations, and it leaves behind a super-salty, chemical-laced soup that harms local ecosystems. There is a simpler option: **some desalination plants allow seawater to naturally evaporate and then capture and condense it, leaving behind natural salt residue.**

- It appears that almost all utility-scale storage systems are **80%** efficient.



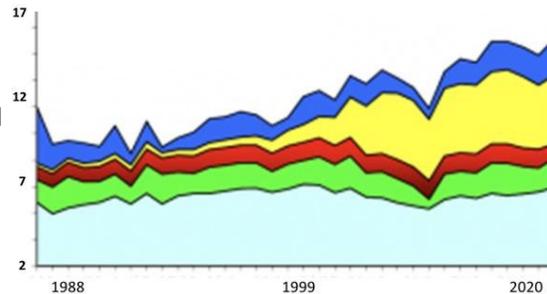
- **Trend-spotting recent corporate commitments to renewable energy:**

- BP and TotalEnergies each paid \$1 billion to develop [offshore wind farms](#) along the UK coast.
 - [Amazon](#) is now the top corporate purchaser of zero-carbon electricity - the power is used at the company's carbon-intensive data-centers (however, the company's overall carbon footprint continues to rise).
 - Chinese solar firm [Xinte Energy](#), a top producer of raw materials for solar panels, has invested another \$2.5 billion in its polysilicon manufacturing plant. (China is already responsible for more than 70% of all polysilicon production.)
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Policy

- Vice President Kamala Harris and White House aides convened cabinet secretaries and the acting heads of 21 federal agencies to begin fulfilling President Biden's promise to mobilize the entire federal government to confront climate change. Gina McCarthy, who heads the White House Office of Domestic Climate Policy, said the administration will also focus on job creation. The Biden administration will announce the government's goals on April 22.

- *Insert:* the many uses of the US corn crop. The amount of corn used for feed, exports, food & seed have all remained essentially the same for the last three decades, while ethanol for fuel has increased substantially since 2004.) See the recent issue of *Energy Today* for reference to a case about RFS heard by the US Supreme Court.



- Texas Governor Greg Abbott banned the interstate export of natural gas until power was restored in his own state:

- Texas produces about 25% of natural gas in the US.
- Normally, the state produces between 22 and 27.8 billion cubic feet daily; during the recent winter storm, the state produced about 9 billion cu ft per day.
- About 7 billion cu ft of natural gas production capacity was [shut off](#) or frozen in pipelines; [wind](#) power generation decreased because some wind turbines were frozen.

- Energy Policy Around the World -

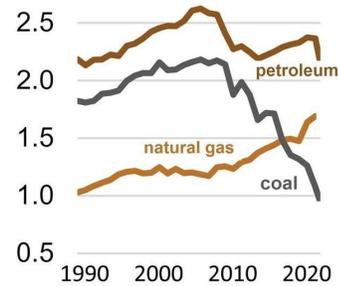
- Much like Russia punishes eastern European countries like Ukraine, China recently [stopped coal imports](#) from Australia.



- There is pressure on the EU to end the Energy Charter Treaty (ECT), which allows multinational companies to sue governments. The Netherlands is the latest EU member to face litigation under the ECT when German energy company RWE sued the Dutch government for €1.4bn in damages over the country's decision to phase out coal by 2030.

Climate and Sustainability

- *Insert: US energy-related carbon dioxide (CO2) emissions by fossil fuel type* (in billion metric tons). *Note: petroleum and coal emissions declined in 2020; natural gas emissions rose. (Editor's note: all are demand-centric trends.)*



- Most countries have made a commitment to cut emissions, but no country is meeting its targets. **The top-5 countries closest to meeting their emission reduction pledges are:**

1. Germany (77% of target achieved)
2. France (74%)
3. South Korea (68%)
4. UK (67%)
5. Japan (64%)

Worst: Saudi Arabia set a goal for renewable power production that's so high it's essentially meaningless; the country pledged to install 27.3 gigawatts of renewable power by 2024, but currently has only 0.4 gigawatts.

Research and Markets

- **Total is rebranding itself as [TotalEnergies](#).**

- A team of environmental scientists and architects have created a **thermal comfort system that absorbs radiant heat from people**, allowing them to feel comfortable even when external temperatures are hot, cold, or humid. AES members have access to the peer-reviewed [paper](#).

- **On average, EV drivers in the US travel 5,300 miles per year (eVMT)**, which is less than half as many miles annually as the average gasoline powered car. AES members have access to the peer-reviewed [paper](#).

- **SPACs surged in 2020, and the [mobility tech](#) industry was a leader.** Last year, 26 companies in the sector merged or began the process of merging with a blank-check company, for a combined valuation of over \$100 billion.



On the other hand, venture capitalists invested \$10.5 billion in mobility tech companies in Q4, a drop of 7.5% compared to Q4 2019.

Electricity, Power, Efficiency and the Grid

- Spotlight: Texas -

- The winter storm that some are calling "Uri" wreaked havoc on the South-Central US, and Texas was hit especially hard:

- On Sunday, February 14, all 254 Texas counties were placed under winter storm warning.
- By mid-Sunday, President Biden declared a "state of emergency" in Texas.
- Sunday evening, energy use skyrocketed as people cranked up their thermostats; Sunday night's peak demand of 69,150 MW shattered records.
- Late into Sunday evening, ERCOT declared an EEA1, which quickly escalated to EEA3, the highest emergency alert, which led to rolling power outages as the grid struggled to maintain capacity.
- On Monday, power outages affected more than 3 million Texans; in response, the US DoE allowed power plants to disregard pollution limits in order to run at max levels.
- Outages also affected Tennessee, Kentucky, Mississippi, Louisiana, Kansas and Oklahoma.
- Almost 5 million people in northern Mexico were without power due to the events in Texas.



- An ERCOT primer: **There are three primary power grids in the United States: The Western Interconnection, the Eastern Interconnection, and the Electric Reliability Council of Texas (ERCOT)**, which is smaller than its two giant neighbors. All three grids serve a basic but important function: they have to perfectly balance generation and load (aka "consumption") all the time so that the entire system oscillates at exactly 60 hertz. In other words, the power grids provide a reliable source of power at a consistent voltage level. As an analogy, think of the grid as a water reservoir kept at an exact level with infinite ways, amounts, and locations that water can be added or removed at any time.

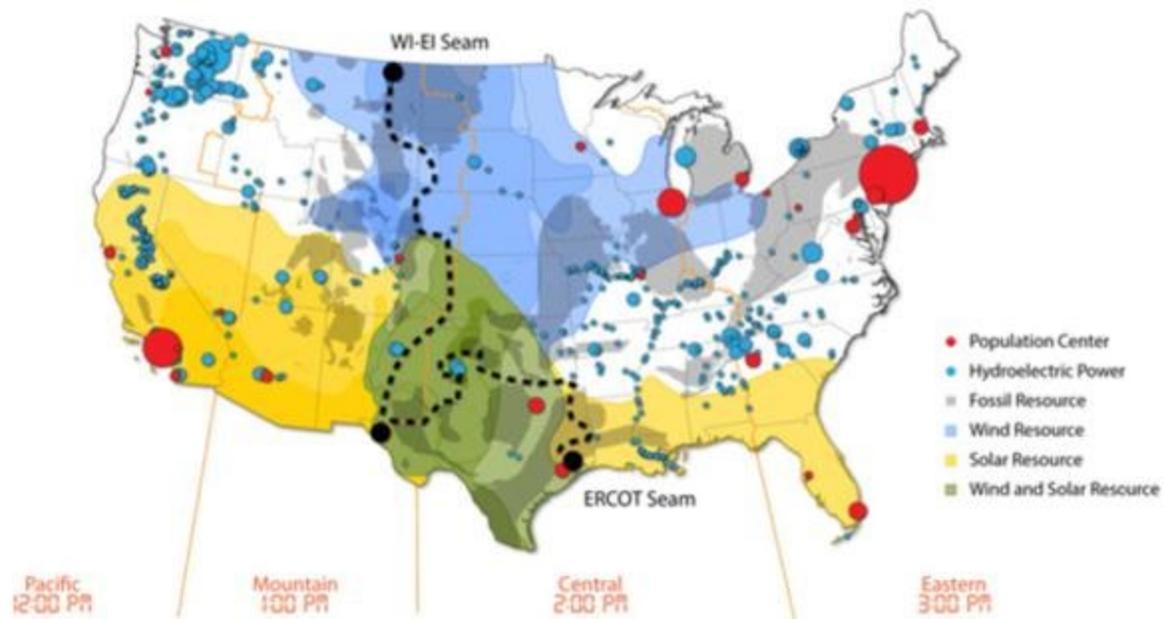
- There are many benefits to the US interconnected grid system (such as reliability and affordability); however, there are **problems with this system** too, which the recent cold-weather event in Texas made obvious:

- Surging demand caused a 34,000 MW shortfall, which led to widespread blackouts.
- Shortages caused the price of electricity to spike to over \$9,000 per 1 megawatt-hour of power (*note: the week before the price was about \$30.*)
- Some retail electricity providers might be facing huge losses or bankruptcy.

- **Recommended books about energy that also discuss the US ISO system:**

- [The California Electricity Crisis](#), by Jim Sweeney (a similar electricity crisis happened in California in the early 2000s, and it led to the recall of the state governor and the rise of Arnold Schwarzenegger's political career).
- [The Grid](#), by Gretchen Bakke (Bill Gates calls it the best book about the US grid).
- [Superpower](#), by Russell Gold (a great read).

- **A nearly impermeable electrical “seam” divides the US eastern, western and Texas power grids** (*insert: the seam is designated by "-----"*). These giant pools of alternating current on either side of the Rockies contain a total of 950 gigawatts of power generation by thousands of power plants. But only a little over one gigawatt can cross between them and there is no exchange between them and the Texas ERCOT system. (For instance, western-grid power plants in Colorado can send bulk power 1,000 miles to California but not to most of its border states like Texas.) *Note: REPLAY - adapted from Energy Matters, August 31, 2020.*



- **New developments in microgrids and storage:**

- The town of Gonzales, California, gets all of its electrical power from its own microgrid.
- The off-grid and mini-grid industry is growing in Nigeria (AES Members have access to the [peer-reviewed paper](#))
- **The DoE launched the [Energy Storage Grand Challenge](#)**; the program's roadmap sets ambitious performance targets for long-duration grid-scale storage (5 cents/kWh by 2030), with an emphasis on domestic manufacturing.

- **Cybersecurity Spotlight -**

- **The SolarWinds cybersecurity attack was more sophisticated than originally assumed.** The operation in December was likely orchestrated by Russia. It breached software made by SolarWinds Corp, giving hackers access to thousands of companies and government offices that used its products. The hackers got access to emails at the US Treasury, Justice and Commerce departments and other agencies. AES cybersecurity expert members say it will take months (if not years) to identify the compromised systems and expel the hackers.

- Member Bulletin Board -



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- IN2 has published its 202 Annual Report, "[Catalyst to Success](#)."
- World Bank and UNEP joint [webinar](#): sustainable energy businesses and education.
- IAEE [webinar](#): Multidimensional Challenges of Energy Justice.
- February 25: The deadline for the C3E Award [nominations](#).
- March 3: Deadline to sign up for the Alaska Angel [Conference](#) 2021.
- March 4: Joules Accelerator Cohort 7 [Graduation](#), with commencement speakers.
- March 12: The MIT Energy Conference - [Charging Ahead to a Cleaner Future](#).
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- Quotes -

"We're seeing the winter version of Hurricane Harvey."

-- Harris County Judge Lina Hidalgo

"Boil your water - water outages are also expected."

-- Arlington Water Utility on its "Boil Water" notices

"We still don't know the real reasons why we had power shortfalls."

-- Texas Governor Greg Abbott

"We will resume vaccinations this weekend, starting with the first 4,800 appointments."

-- The Houston Health Department

"I can't wait for summer."

-- An anonymous Houstonian

[#LoveThyNeighborTX](#)

-- **Fundraiser for those in need, hosted by Urban League**

- Gratitude -

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