

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

AN OFFICIAL PUBLICATION OF



AMERICAN ENERGY SOCIETY

April 18, 2022

- The Power Read -

- **Oil:** Oil production in the US is increasing across all regions.
- **Gas:** Propane exports have increased since the start of the shale revolution.
- **Mining:** The most productive mining region in the world is Western Australia.
- **No-/Low-Carbon:** Texas is the top US state in clean energy development.
- **Policy:** In Q1-2022 Russia set its export record.
- **Climate:** More energy use does not always = a happier life.
- **Quotes:** *"Draw a line ... then blur it."*—Winston Churchill, the art of compromise.

- News from the Society -

- **[Nominate](#) a deserving candidate for the AES Academic/Research Digital Librarian of the Year.** The winner, announced at the [ALA conference](#) in June, receives an all-expenses paid personal day of their choice (some restrictions apply).

- July 7 – 8, **American Energy Society** co-hosts the 12th annual SISE Conference: [Celebrating the Prosumer](#), in partnership with the University of Illinois, Chicago, and Argonne National Laboratory.

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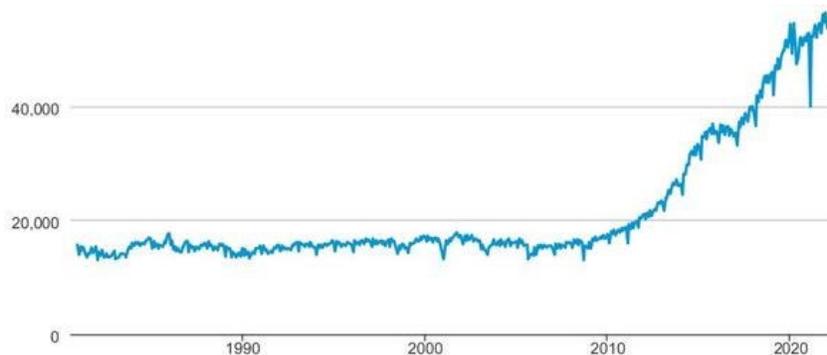
- Fossil Fuels -

- Oil -

- The total number of **operating** oil and natural gas rigs in the US is **689**. Texas recently added 11 rigs (it now has 342 active rigs), while single rigs were added in Oklahoma (50), North Dakota (33), Wyoming (16), Colorado (15), and Ohio (12). As a point of comparison, there were 432 active rigs at this time last year. *Note:* Canada's rig count recently decreased by 13 to 111, compared with 58 working rigs one year ago.

- Gas -

- US exports of **propane** have increased every year since **2007** as a result of increased crude oil and natural gas production and expanded export capacity along the US Gulf Coast.



- Mining, Minerals and Coal -

- Top-10 most productive mining regions, 2021:

- | | |
|-------------------------------------|--------------------------|
| 1. Western Australia | 6. Quebec, Canada |
| 2. Saskatchewan, Canada | 7. Idaho, US |
| 3. Nevada, US (formerly #1 in 2020) | 8. Morocco (unconfirmed) |
| 4. Alaska, US | 9. Yukon, Canada |
| 5. Arizona, US | 10. South Australia |

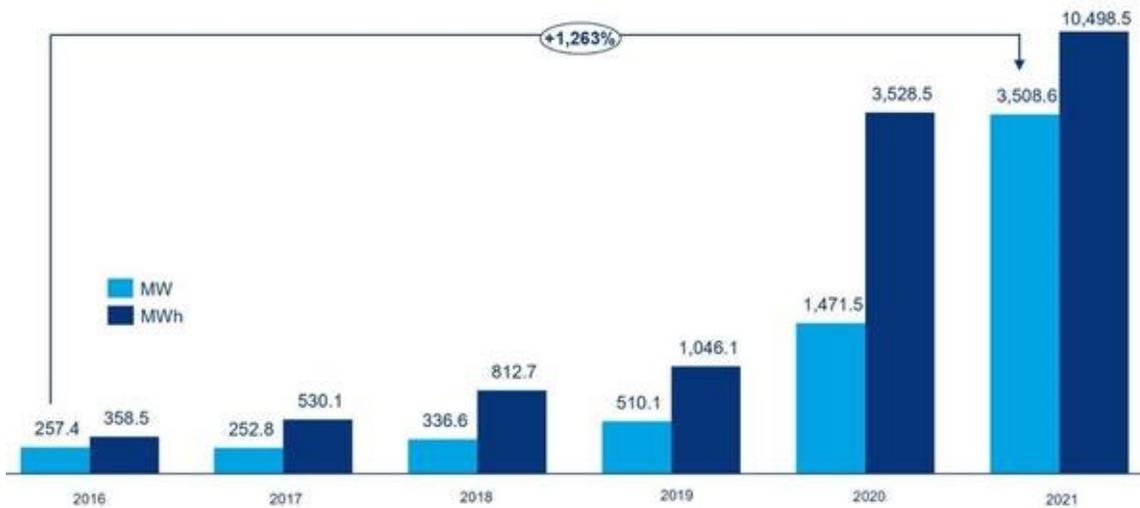
Note: Canada issues permits the quickest.

- Carbon Capture -

- Companies like Stripe, Shopify, Alphabet, and Meta just launched Frontier, a **\$925m fund that supports carbon removal** — with plans to raise even more money. However, Frontier only has a few committed suppliers or buyers of captured carbon.

- Low-Carbon Energy -

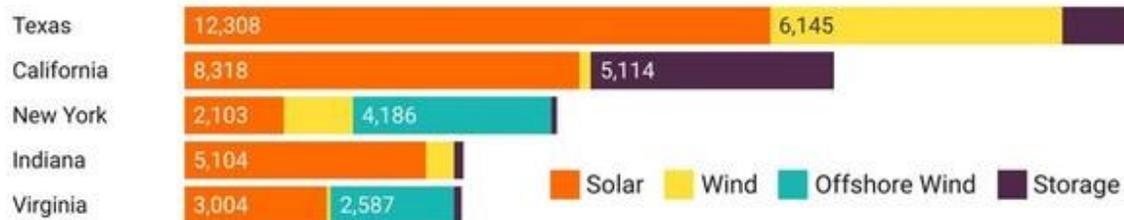
- Energy storage [deployments](#) in the US for all market segments, from 2016 – 2021:



- Top-10 countries using [wind](#) to generate electricity, as a percent of total electricity.

- | | |
|---------------------|-------------------------|
| 1. Denmark (48%) | 6. Spain (23%) |
| 2. Uruguay (43%) | 7. United Kingdom (21%) |
| 3. Ireland (33%) | 8. Germany (20%) |
| 4. Portugal (27%) | 9. Greece (20%) |
| 5. Luxembourg (25%) | 10. Kenya (16%) |

- US states with the most [clean energy](#) capacity in development, by megawatts of projects in advanced development at the end of 2021.



- [Spent nuclear fuel](#) (aka "nuclear waste") is stored in individual canisters called ISFSI (pronounced "ISSfuhsee"). The waste begins as spent rods that hold lots of solid pellets, each slightly larger than a pencil eraser. After cooling for at least five years in pools of water, the rods are transferred into stainless-steel ISFSI canisters weighing about 50 tons with walls 5/8" thick and then lowered into stainless-steel cavities underground. Right now, **there are about 80 locations in 35 states where spent nuclear fuel is stored underground.** These storage facilities generate about 13 microrem per hour of radiation. For context, passengers in an [airplane](#) on a one hour flight will be exposed to about 700 microrem — because they are closer to the sun.

- New thermophotovoltaic [TPV cells](#) convert heat to electricity with over 40% efficiency, a performance level that is nearly on par with traditional steam turbine power plants.

- Energy Policy & Geopolitics -

- Beltway Buzz -

- This summer, **President Biden will allow [more ethanol to be blended into gasoline](#)** in order to lower gas prices. Most gasoline sold in the US is blended with 10% ethanol, a biofuel currently cheaper than gas; the emergency waiver will allow a 15% ethanol blend for this summer. Meanwhile, as per President Biden, the US the Interior Department will hold its first sale of oil and natural gas drilling leases on public lands, but will increase the royalty rate to 18.75% from 12.5%.

- For the first time, **the White House Office of Management and Budget (OMB) has released a report on the [effects that climate change will have on the federal budget](#)**. The OMB projects a potential loss of 3 to 10% US GDP; the upper end of this range would mean a loss of \$2 trillion annually by the end of the century. [AES Members](#) have access to the OMB white paper.

- The Build Back Better Act may not move forward in its original form, but **about \$550B+ in cleantech funding is still under consideration**.

- **A new bill on carbon removal procurement was introduced in Congress: the Federal Carbon Dioxide Removal Leadership Act**. AES Members have access to the [Fact Sheet](#).

- Policy Around the World -

- **Russia set its all-time [record for export revenues in Q1-2022](#)** (\$9.6 billion, or 798.4 billion Russian rubles), in spite of sanctions and almost entirely due to higher oil and gas prices. China and India are the largest purchasers of Russian oil and gas, and some European countries may [end](#) their embargo. Meanwhile, the EU announced it would ban imports of [coal](#) from Russia as of August 2022.

- **Kazakhstan is [worried](#) that Russia might invade** (translation of source available).

- Climate and Sustainability -

- **There is about 550,000 tons of plastic trash each year**. Much of the plastic trash found in rivers comes from clothing fiber (about 50,000 tons), while a significant amount of plastic in the oceans comes from roads (about 80,000 tons). [AES Members](#) have access to the peer-reviewed research.



- **Nearly every census tract between Baton Rouge and New Orleans — some call it “[Cancer Alley](#)” — has a higher cancer risk than 95% of the US**. Louisiana Department of Health allows several facilities along this "Alley" (a chemical complex, a plastics plant, a grain terminal, etc.) to release dangerous levels of [toxins](#).

- Apparently, **more energy use [does not always equate with a happier life](#)** (i.e., more energy does not necessarily provide better health, economics, climate...) The 10 countries with greater well-being than other countries using similar amounts of energy per capita: Albania, Bangladesh, Cuba, Denmark, Finland, Iceland, Malta, Morocco, Norway and Sri Lanka. *Editors' note:* The AES [Energy Writer of the Year 2019](#), Vaclav Smil, makes this same point in his book, [Growth](#).



- In terms of overall "[cleanliness](#)" (emissions, materials, repairs, etc.), the electric Hummer is about three times cleaner than a gasoline powered Toyota Corolla but three times less clean than a Tesla Model Y. *Editor's note:* the resource that generates the electricity has a significant effect on the measure of cleanliness.

- Research and Markets -

- The headline announced the unthinkable: *German Retailer Ditches Battery-Electric Logistic Fleet for Hydrogen Fuel Cell*. Apparently, German retailer Lidl was converting its entire electric vehicle truck fleet to fuel cells, and the image that accompanied the story conveyed the scope and scale of this massive transition (*insert below*). **The image is a lie. Lidl is merely converting the EV batteries to hydrogen fuel cells for 100 forklifts only at its logistics center.** (Notice the English slogan on the German trucks, and that all of the trucks are parked perfectly; they are clearly photoshopped.) But the ad campaign by Nikola Trucks in 2018 is still more deceptive. Their advertisement consisted of a Nikola electric truck moving rapidly on a two-lane desert highway; however, the truck had no engine and was [rolling downhill](#).



- MOlecular Solar Thermal (MOST) system: a specially designed molecule of carbon, hydrogen and nitrogen. When sunlight shines on the MOST molecule, the atoms within the molecule rearrange to change shape and become an energy-rich isomer. **The MOST isomer can be stored in liquid form or connected to an ultra-thin thermoelectric generator to produce electricity.** Thank you AES Member Wayne Herr for the insight. [AES Members](#) have access to the peer-reviewed research.

- **The Small Business Association just launched America's Seed Fund Startup award.** [Applications](#) are considered on a rolling basis and must be submitted before April 22.

- **The US DoE launched the inaugural Hydropower Collegiate Competition;** applications close May 8, 2022. Related, AES Members have access to the AES report, [Water Works](#), a white paper on hydropower.

- Electricity, Power, Efficiency, and the Grid -



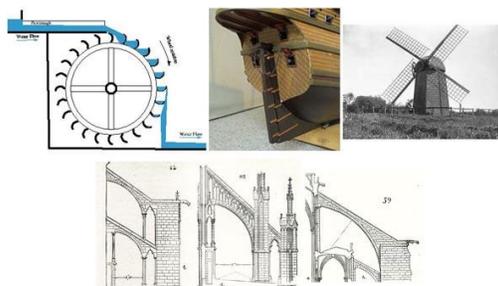
AES applauds the [LBNL report & insights](#): 1.4 terawatts of clean energy and storage capacity are stuck in interconnection queues waiting to be connected to the grid; with it, the US would reach 80% clean electricity in 2030. However, **most of that capacity is stuck in the queue – the transmission system needs to expand by 60%.**

- **There are 26 pilot projects injecting [hydrogen](#) into existing gas pipelines.** These range from individual utilities testing new hydrogen production and storage technologies to the ambitious US DoE [HyBlend](#) collaborative project.

- *Special insights:* In the 1990s, FERC established a series of energy [market rules](#) that were based on "large, centralized generators which made up the large majority of energy supply." However, these older rules do not take into account new competitive wholesale energy markets that have access to substantial sources of renewable energy. **Recent FERC proceedings are trying to revise the older rules to account for newer market conditions.** The problem is the enormous variety across the US power system, from solar-rich California, to the windswept heartlands, to the diverse resources in Texas, as well as the Northeast's distributed generation portfolio. [AES Members](#) have access to the records of the FERC proceedings that tried to address the evolving needs of the nation's electricity sector.

- **Between 1086 AD and 1330 AD, many new technologies were introduced** that harnessed or used energy or power; on a related note, during this same period, per capita income tripled in England and much of western Europe. These energy tech innovations include:

- windmills (introduced from Iran)
- sternpost rudders
- vertical overshot wheels
- flying buttresses



Additionally, other innovations during these three centuries include: plowing with horses, wool spinning wheels, horizontal pedal looms, compasses, larger sailing ships, spectacles.... *And then came the plague decades.*

- So far in April, **electricity in California has been generated from [nearly 100% carbon-free](#) sources.**

Note - the following is a paid advertisement: **if you are an enterprise that has data but does not have the talent or staff to make it valuable**, please consider the proSkale [platform](#) - it helps organizations manage and invest their data ... like cash.

- Cybersecurity Spotlight -

- **Right now, Russian cybersecurity attacks are targeting IoT-based "[smart](#)" distributed energy resources (DERs) in the US.**

- Universities in the Spotlight -

- A graduate student startup from **RWTH Aachen University in Germany** won the [Rice University Business Plan Competition Grand Prize](#) of \$682,000 for technology that eliminates material waste in semiconductor manufacturing.

- **Kaua'i Community College** is showcasing its "[tiny](#)" houses.

- Andlinger Center for Energy and the Environment at **Princeton University** is [supporting student research](#) on topics ranging from carbon capture to renewable energy technology.

- **UMass Amherst** is offering [training certificates](#) for the Carbon Literacy Project, created by **Manchester Metropolitan University** in the UK. Total training takes 8 hours, broken into four 2-hour classes. The certificate is awarded upon completion of the program.

- **Duke University** recently merged its Energy Initiative with the Nicholas Institute to support a [more interdisciplinary approach](#) to climate-related research, education and engagement.

- The reach and impact of the [Bureau of Economic Geology](#) at the **University of Texas, Austin**, is so much more than its name.

- Quotes -

"Draw a line ... then blur it."

- Winston Churchill, on the art of *compromise*

"The reality is we don't have the votes to do everything we want. So compromise is called for. Is it the compromise I would like? No. But ... every now and again you have to swallow a toad. And this is swallowing a toad." - Rep. Donald McEachin (D-Va.), Member of the US House of Representatives, on passing climate legislation during a geopolitical crisis

"We are trying to ... ban the import of Russian oil while making sure that there is still an appropriate supply of oil on world markets." - Secretary of State Antony Blinken, on the challenge of responding to Russia's invasion of Ukraine

"Considering the current demand outlook, it would be nearly impossible to replace a loss in volumes of this magnitude." - OPEC's Secretary-General Mohammad Barkindo, on any embargo or ban on Russian oil

"We're not in a position to help households right now because it would cause more inflation."

- Jason Furman, economist at Harvard on addressing gas prices

- Bulletin Board -

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- [Raizen](#): Ferrari Formula 1 will start using second-generation ethanol in their F-1 cars. (second-generation ethanol is made from non-food biomass while generating 86% less emissions than fossil fuels). *Editor's note*: some members of the AES [editorial team](#) root for F-1 driver [Sebastian Vettel](#).

- UnEarth is co-hosting a [joint webinar](#) with Bentley Systems for water utilities on building a lead service line inventory.

- Don't miss the upcoming [Deep-Tech Showcase](#), April 27 at 1:00 pm ET (online).
- *Recommended*: [free eBook](#), *Ground Robots for Autonomous Operations in Oil & Gas*.
- **Clearpath** has published a new report on [clean hydrogen](#).

- Gratitude -

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