

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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- The Power Read -

- **Natural gas:** Oil prices drop in spite of strong inflationary pressure.
- **Markets:** There are only five applicants to lead the the new \$14bn US Green Bank.
- **Renewables:** Texas now generates more utility-scale solar power than California.
- **Policy:** The US Treasury and IRS are busy proposing new tax rules.

And don't miss...

- **Animal planet:** chinchillas, dogs, and steelhead — oh my!
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- Fossil Fuels -

- Oil -

- A range of market forces would imply that oil prices should be going up:

- Russia's full-scale invasion of Ukraine followed by the EU import ban on Russia's crude oil and products;
- Several interest rate hikes among global central banks, as well as inflation and recession concerns.
- OPEC+ extended crude oil production cuts, as well as Saudi Arabia's voluntary cuts.
- Geopolitical conflict, especially in the Middle East, which reroutes oil tankers around the tip of Africa.

And yet ... **Brent crude oil prices averaged \$19 per barrel [less](#) in 2023 than 2022.** (*Note: weaker-than-expected demand was a factor, but exceptional shale production in the US drives oil markets right now.*) Indeed, the US has [doubled](#) production of crude oil since 2010.

- Natural gas -

- The US had [record-high](#) natural gas production in 2023. The Marcellus shale play in the Appalachian Basin (Ohio, Pennsylvania, and West Virginia) is the [largest](#) natural gas-producing region in the US, comprising almost one-third (29%) of total US production; the Permian is a [distant second](#) followed by Haynesville. (Note: BP produces the most gas in the Appalachian Basin.)



- Coal and mining -

- Construction of a new mine (gold, lithium, etc. — estimated value: \$7bn) in the Atacama region of northern Chile is 99.3% but **has been [put on hold](#)** while **25 critically endangered chinchillas are safely removed.**

- Carbon capture and removal -

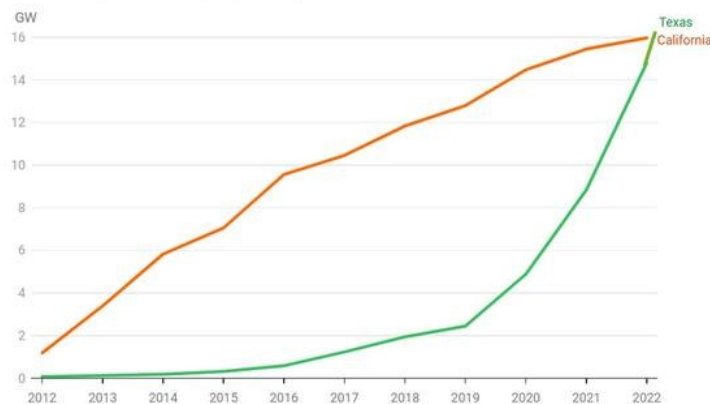
- EPA granted Louisiana [oversight](#) over permitting its own carbon sequestration wells (known as “Class VI” wells). Louisiana is the third state to achieve carbon sequestration permitting “primacy,” after North Dakota and Wyoming.

No- / Low-Carbon and Renewable Energy

- In 2023, 21 out of 319 climate tech funding rounds in the US went to [female-founded](#) companies (about 6.6% of all deals).

- By the way, don't miss the [WCS Talks](#) on January 20 from 9:00 am to 3:00 pm, sponsored by Women in Cleantech and Sustainability.

- Texas now generates [more](#) utility-scale solar power than California (but California still leads in total solar installed). *Insert:* installed utility-scale solar capacity, Texas vs. California.



- **Related**, utility-scale solar is growing fastest in Massachusetts and North Carolina.
- For the first time, the offshore Vineyard [Wind](#) project is sending power to the grid.
- **Related**, on average a single wind turbine [kills](#) about 4 to 6 birds and 6 to 20 bats each year.

Insert below: [Filson](#) is trained to detect bird and bat fatalities on wind farms.



- Energy Policy & Geopolitics -

- Beltway buzz -

Note: Congress has a lot of budget work to do before the January 19th fiscal deadline, and the Iowa caucuses are on January 15.

- **The Biden Administration issued [new efficiency rules](#) for residential refrigerators.** The new rules have the support of consumers, energy efficiency and industry groups, and both parties in Congress. The US CBO estimates that the new rules will reduce household utility bills by \$92 billion each year and prevent 420 million metric tons of carbon emissions.

- **US Department of the Treasury and IRS are busy working on new energy tax rules:**

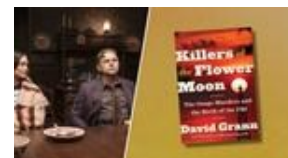
- Rules about tax credits for sustainable aviation fuels have been postponed to March;
- Tax credits for electric vehicle manufacturers got a lot harder;
- [Very few](#) clean hydrogen projects will qualify for the [proposed](#) Section 45V production and/or investment tax credits:

<u>Kg of CO2e</u>	<u>PTC rate: \$0.60/kg times:</u>	<u>ITC rate: \$ of facility cost</u>
2.5 <	20%	1.2%
1.5 < 2.5	25%	1.5%
0.45 < 1.5	33.4%	2%
< 0.45	100%	6%

- **Related**, the IRS is considering new rules for tribal governments that allows for an [exemption](#) from the domestic content requirements tied to clean energy tax credits.

- **There are only 3 offshore oil and gas lease auctions scheduled for the next 5 years**, the [lowest](#) number of lease sales since the US implemented an offshore drilling program.

- **A federal judge ordered the [removal](#) of the 84-turbine Osage Wind Farm.** It's rare for a court to remove an operating energy development, and there is no way to determine if the recent film, "[Killers of the Flower Moon](#)" inspired the court to sympathize with the Osage Nation.



- Since passage of the Inflation Reduction Act in August 2022, more than 100 new clean energy manufacturing facilities or factory expansions have been announced. **Georgia has had the [most activity](#) of any US state.**

- Wilson Sonsini updated its Clean Energy and Climate Solutions Federal Funding [database](#).

- Global energy politics -

- **Europe:** Several major European fund closes have had [all-time highs](#), but the 10 largest PE funds account for 70% of all capital raised, leaving a long tail of smaller and less-established managers who have struggled to secure commitments this year.

- **ME/NA:** The twin bombings in Iran, heightened tensions in the Red Sea, and the assassination of a key Hamas leader in Lebanon signal that the Gaza war risks turning into a larger regional war.

- **Asia:** Fossil fuels accounted for 75% of Asia's energy in 2023, and the region consumed about [half](#) of the global total; however, about 150 million people on the continent do not have access to electricity.

- **C/SA:** Brazil [increased](#) the country's mandatory biodiesel mix into diesel at 14% in 2024 and 15% in 2025, up from the current 12%. The new requirement strengthens the industry — about 70% of the country's biodiesel is produced from processed soybeans. (Note: the US ranks number one and Brazil ranks second as the largest producers of [biodiesel](#).)

- Climate and Sustainability -

- **Each product we buy, on average, accounts for roughly 6.3 times its weight in carbon emissions.** AES [Members](#) have access to the peer-reviewed research.

- **The [lowest](#) carbon intense oil and gas comes from the Gulf of Mexico (US-based).**

- **Making clean hydrogen has attracted [more investor interest](#) than managing CO2 emissions.** Since 2018, one and a half times more investment has gone to clean hydrogen (\$45.7 B) compared with capturing, storing and utilizing carbon emissions (\$29.98 B).

- Research and Markets -

- "Kanatidisite" — a new mineral [discovered](#) in an abandoned Nagybörzsöny gold mine in northern Hungary, Kanatidisite belongs to a class of materials known as chalcogenides, a sulphur-containing material used for infrared and fiber optics, thermal imaging, photovoltaic devices, gas sensors, etc.



- **Only five applications have been submitted to lead the new \$14bn National Clean Investment Fund (NCIF).** The bank that is chosen to lead the NCIF will have to fulfill a congressional mandate to get the money out the door by the end of this fiscal year. Applications will be reviewed by EPA and the

departments of Energy, Treasury, Housing and Urban Development, and Labor. Then, a panel of “senior agency officials” will vet finalists. The five institutions that have submitted applications are, in no particular order:

1. [Climate United](#)
2. [Justice Climate Fund](#)
3. [Coalition for Green Capital](#)
4. [Power Forward Communities](#)
5. [Ecority](#)

- **The most active early stage (\$200K to \$1.1M) SBIR/DoE funding categories.** AES Members can [contact us](#) for more information.

- Advanced Materials
- Battery Management (including SaaS)
- Bioenergy Technologies
- Energy Systems Cybersecurity
- Geothermal
- Quantum Sensors
- Water Power Technologies

- **For the first time, 1,000,000+ EVs were sold in a single year.**



- Related, **most of the money allocated by the 2021 Bipartisan Infrastructure Law has [not been distributed](#).** For example, a \$7.5 billion initiative to build a national network of EV chargers has built just [two](#) charging stations, one in New York and the other in Ohio. (Note: the US has about 180,000 public chargers, but only 41,000 are fast chargers; NREL estimates that the US needs about 1.2 million public chargers and 182,000 fast chargers.)

- Electricity & Power -

- **The Biden administration announced the removal of four lower Snake River dams** (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite), which means that salmon and steelhead populations will return to healthy levels in two fish generations, (eight to ten years).



- **Now, more heat pumps are sold in the US than gas furnaces.**

- **California's energy storage capacity has grown 10X in the last 3 years.**

- Excluding extreme weather events, **ERCOT is the tightest ISO grid in the US**, driven partly by the heat, and partly by long-term underlying population (load) growth.

- This is *not* a good market for utility-scale battery operators attempting to capture real-time arbitrage because temperatures, especially in the western US, have been extremely moderate. **Moderate weather means that battery fleets cannot take advantage of charging opportunities** at low electricity prices or high electricity demand.

- Once again, **electricity prices in Europe went wholesale negative during the December holidays**, due to low demand, unexpectedly high temperatures, and robust renewable energy production. Some power plants [shut down](#) rather than sell electricity at a loss.

- Universities in the Spotlight -

- **University of Texas, Arlington** is offering a Resource and Energy Engineering (REE) [bachelor's degree program](#) — a new global study of energy and natural resources.

- The Center for Carbon Management in Energy (CCME) at the **University of Houston** offers a number of [White Papers](#) about carbon capture, including but not limited to: 45Q, the federal and social cost of carbon, H2, CCUS....

- **SMU Cox MBA** students won [first place](#) at the National Energy Finance Challenge (NEFC).

- **Rice University** has a number of [energy organizational research units](#), usually headlined by the Baker Institute for Energy Studies. But don't forget about, among others, the Center for Environmental Studies (formerly CENHS), Green Carbon Center, Rice Biochar Group....

- A number of organizational research units affiliated with the **Texas A&M Energy Institute** are focusing on the energy, food, water nexus.

- Quotes -

How would you describe what to expect in 2024?

"a political year" — Frank Maisano, a senior principal at the law firm Bracewell

"silly season" — Former House Energy and Commerce Chair John Dingell

"frantic" — Christian Robles, reporter for Politico

- Bulletin Board -

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- **ClearPath** has excellent [primer resources](#) on Ag-Tech, CCUS, Water-Tech, Industrial Fuel..

- **Honeywell's Sustainable Building Technologies (SBT)** is hiring for a global [Senior Director Solutions Architect](#).

- **Ubiquitous Energy**, a leader in transparent solar technology, is [developing](#) energy generating windows and door products.
- **Orrick** has a recorded [webinar](#) on the Inflation Reduction Act, with emphasis on hydrogen.
- **Sunrun**, a residential solar and battery storage installer in the US, has partnered with Ford to launch a new [home electric vehicle \(EV\) charger](#) that is compatible with any EV model.

- Gratitude -

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