

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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July 15, 2024

- The Power Read -

- **Gas:** LNG spotlight - the shale revolution continues.
- **Renewables:** Fusion spotlight - tokamak reactors.
- **Policy:** SCOTUS spotlight - Chevron ruling in context.
- **Climate:** *Pop quiz* - how much global philanthropy supports "climate" issues?
- **Markets:** Startup spotlight - climate-tech startups considering an IPO *and* the most active investment vertical: Defense Tech.
- **Save the date:** [Houston Energy and Climate Week](#) on September 9 - 13.

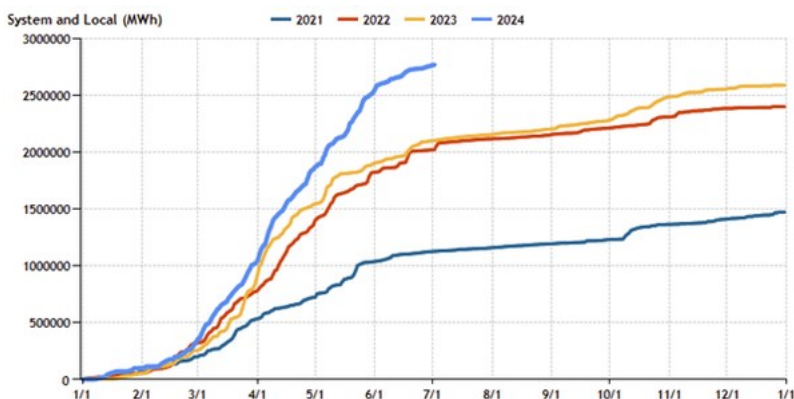
- Fossil Fuels -

- Oil -

- Correlation or causation? [Saudi](#) and [Russian](#) oil exports were lower in Q2; related, [China](#) oil imports were lower in Q2.

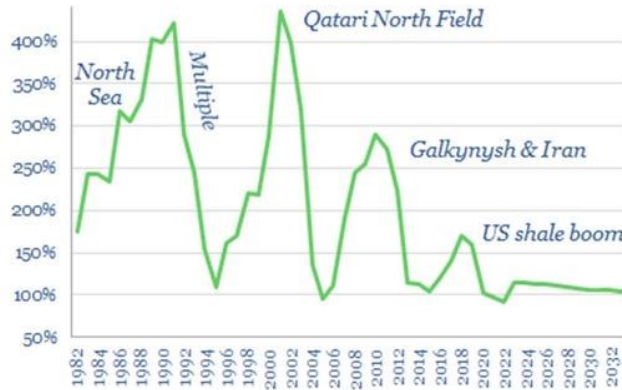
- Spotlight: the shale gas revolution continues -

- Total natural gas for US electric power utilities plus reserves, a Y/Y comparison (note the substantial increase year-over-year):



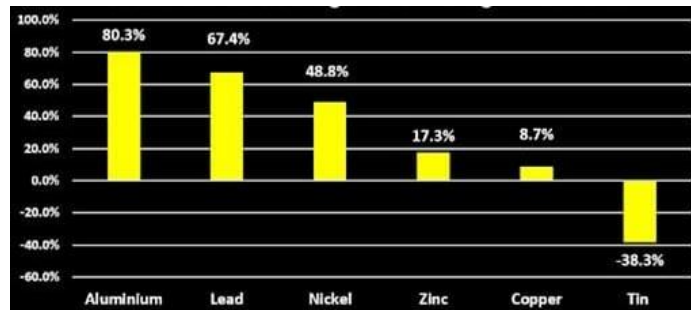
And a few other things about **unconventional shale gas in the US**:

- While the Permian is the dominant producer of natural gas right now, there have been other primary NG production centers in the past.
- Current US shale gas production in the US is not the largest in the last 50 years (insert below).
- The current reserve replacement rate in the US suggests that this boom will last much longer than production booms in other regions and other eras (insert below).



- Coal and mining -

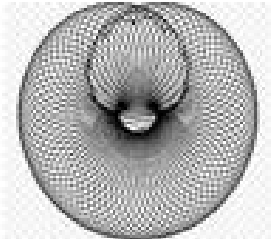
- Prices for base metals are declining — depressed by high inventories and soft demand in China — with one notable exception: **tin**. (Production of tin in Myanmar and Indonesia has been disrupted by political instability.) *Insert: metals futures.*



- Carbon capture and removal -

- Running Tide, a carbon removal startup that had signed 25 customers, including Microsoft, Shopify and Stripe, is **shutting down** because corporations were not signing contracts for carbon removal credits that could be traded on a *voluntary* open market.

- No- / Low-Carbon and Renewable Energy -

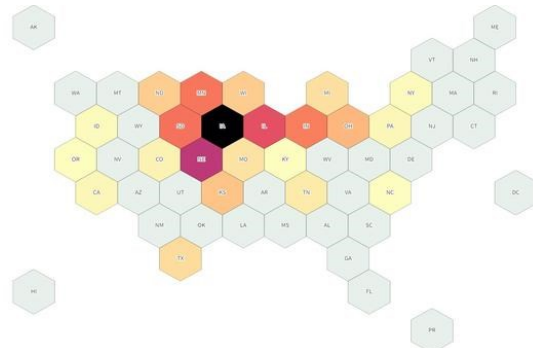


- Almost all fusion experiments involve a [tokamak reactor](#), a technology developed in the 1980s that uses magnets to confine plasma in the shape of an axially-symmetrical torus (*insert*). The most recent successful fusion experiment was conducted at the [Huanliu-3](#) lab in China, a tokamak project run by 17 collaborating labs.

- *AES special report: a financial comparison of the 4 largest EV battery manufacturing companies in the world:*

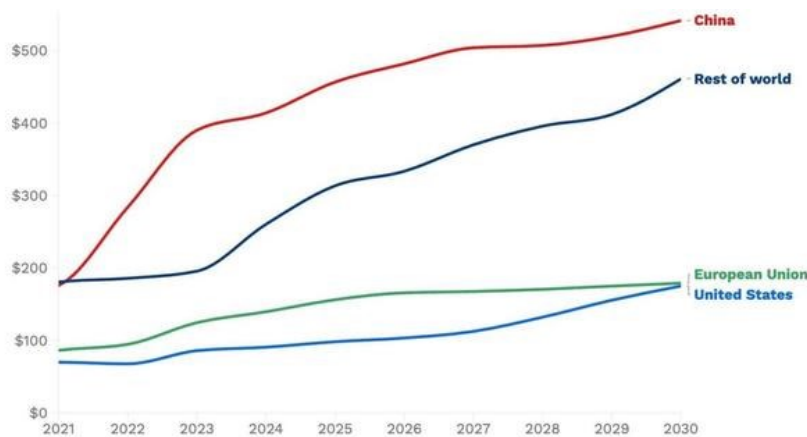
1. CATL (Contemporary Amperex Technology Ltd): \$1.45B net profit in Q1, but 19% lower than Q4 2023.
2. BYD: net profits up 10.5% Y/Y but down 47% in Q1 2024 (but still profitable).
3. LG Energy: a 58% drop in operating profits in Q2 2024 (but still profitable).
4. SK On: 10 consecutive quarters of losses and \$10B net debt (*crisis*)

- A regional comparison of fuel [ethanol](#) production capacity in the US (from **low** to **moderate** to **greatest** capacity):



- There are about 3,747 [hydropower](#) plants in the world (either operating or under construction), contributing 17% of global electricity (more than nuclear, wind, solar, bioenergy, and geothermal combined). The fastest growing hydropower markets (construction phase) are in China, India, and parts of Africa and South America. [AES Members](#) have access to *Water Works*, an AES published study of hydropower in the US.

- *Insert below: Total public + private [investments](#) in cleantech, by region in billions USD.*



- Energy Policy & Geopolitics -

- *SCOTUS spotlight*: **The Supreme Court overturned the "Chevron Deference," a 40-year precedent-setting legal principle that shaped environmental regulatory policy.** Meanwhile, the EU enacted a law which limits or bans imports of LNG and crude oil whenever the methane output associated with production exceeds certain limits. It turns out, natural gas and crude oil produced in the US does not comply with the EU's new methane rules and will be out of compliance even if the SCOTUS ruling on Chevron blocks the new Biden methane emission rules. In other words, US exports of LNG and crude oil to Europe can be banned by the EU after 2026. (Note: the EU takes half US LNG right now.) [AES Members](#) have access to *Energy Today: The Four Most Important Energy and Environment Cases in SCOTUS History*.

- A Maryland judge [dismissed](#) Baltimore's suit seeking climate change related damages from oil companies including Chevron, Exxon and BP, ruling that the city's claims stem from a global phenomenon and thus are "beyond the limits of Maryland state law."

- Beltway buzz -

- Congress returns to session after two weeks on the campaign trail. **Both the House and Senate are focused on budget issues**, including energy, environment and interior funding. No other issues, including permitting, will get pre-election discussion.

- Global energy -

- **Africa: South Africa**, the continent's most industrial nation, has had more than 100 consecutive days with no power cuts, an [all-time record](#). Most of the power for the electricity sector comes from a combination of coal and renewable energy.

- **Asia**: Overproduction of solar panel manufacturing in **China** has led to [losses](#) for major producers, who are now selling panels at below-market prices.

- **Europe**: Europe now generates [more](#) renewable energy than it imports from Russia.

- **L/S America: Bolivia** experienced a brief political crisis when Army Commander General Juan José Zúñiga attempted a coup, supported in part by foreign interests that wanted to take control of Bolivia's [lithium resources](#).

- **North America**: The AESO Market for Alberta, **Canada**, a coal-free grid after it closed the last coal-fired power plant one month ago, is now experiencing a record-setting heat wave without wind. On the first hottest day peak demand jumped one full gigawatt (from 10.7 GW to 11.7 GW) while wind generation was less than 0.3 GW. Alberta's grid, especially in Calgary, is on "[alert](#)" but it is holding steady.

- Climate, Sustainability, and Resiliency -



- What percentage of global philanthropic giving goes to issues related to climate/climate change? (Answer is the last story in this Climate section.)

- A. 51%
- B. 33%
- C. 25%
- D. 2%

- "Elite" news sources (national and large cities) cover climate change far more frequently than "heartland" media sources (state and local news outlets), and the difference is increasing. For instance, in 2011 there were 104 days when heartland news sources had more coverage about climate change than elite news outlets (about 1/3 of the year); by 2022, there were only 11 such days (3% of the year). Or, in 2023, elite news outlets produced roughly three times more coverage of climate change than heartland news outlets. [AES Members](#) have access to the peer reviewed media studies research.

- Atmospheric methane has increased in concentration by 160% since preindustrial times and accounts for 35% of warming from greenhouse gases from 2010 to 2019. It appears that [76% of the total methane emissions](#) are either fully human caused or related to human influences. It is unclear if or how much of the remaining 24% of methane emissions is natural (aka bottom-up "sinks" like wetlands and soil uptake) or also related to fossil fuel production.

- Oceans are now facing a triple-threat: 1) extreme water temperatures, 2) low oxygen levels, and 3) acidification. [AES Members](#) have access to the peer-reviewed research.

- Answer: **D - 2%**. Americans donate significantly more money to climate issues (\$499 B) than the rest of the world; on the other hand, it is only 3% of their total giving. A breakdown of philanthropic giving in the US, by category: 3% for climate issues; 5% for arts, culture and humanities; 10% for health; 13% for education; and, 27% for religion/churches.

- Research and Markets -

- AES trend-spotting: a [watchlist](#) of climate tech startups that could do an [IPO](#) by 2025:

[Sila](#) (supercharged Si car batteries)

[Arcadia](#) (community solar)

[Northvolt](#) (Li-ion battery manufacturer)

[Verkor](#) (battery manufacturer in France)

[Mainspring](#) (alternative energy generators)

[Form Energy](#) (long-duration batteries)

[Lyten](#) (Li-sulfur batteries)

[KoBold Metals](#) (AI-driven mineral exploration)

[Xpansiv](#) (spot exchange for carbon credits)

[Climeworks](#) (DAC)

- Joby Aviation successfully completed the [first](#) flight of a hydrogen-electric air taxi. The taxi flew 523 miles and was powered by liquid hydrogen. See also the SEP "[H2 newsfeed](#)."



- Hurricane Beryl, the first Atlantic hurricane of the year to strike the US, made landfall in eastern Texas as a Category 1 storm.

- The Texas Gulf Coast got 5 to 15 inches of rain and 80 mph winds.
- About 2.5 million people were without power (with temperatures between 75° - 90°F).
- Many refinery operations and LNG liquefaction plants were cut back.

- The most active energy investment vertical right now is [Defense Tech](#). The investment *thesis*: growing geopolitical unrest (South China seas, BRIC+, Russia, etc.) and (or because of?) increasing exposure to extreme weather (flooding, drought, desertification, wildfires, and thawing permafrost) have become serious threats to national security.

- Spotlight on [ResTech](#) -

- AES applauds the [report](#) (PDF), *Twin Cities Climate Resilience Plan*, by the University of Minnesota.

- Electricity & Power -

- Commercial demand for electricity to power large-scale computing facilities (aka [data centers](#)) is concentrated in two states: Virginia (+14 BkWh) and Texas (+13 BkWh).



- Related, because data centers demand enormous amounts of energy, there is some discussion about **moving data centers into outer space and powering them with solar energy**. The leading research group on [space-based data centers](#) is ASCEND (Advanced Space Cloud for European Net zero emission and Data), funded by the European Union. However, some experts believe this is a pie in the sky.

- *Spotlighting the macro-view of US power consumption: In 2023, 94 quadrillion BTUs was consumed in the US, a 1% decrease from the year before.* Fossil fuels—petroleum, natural gas, and coal—accounted for nearly 83% of total US energy consumption. Non-fossil fuel energy—from renewable sources including nuclear—accounted for the other 17%. In 2023, petroleum remained the [most-consumed fuel](#), as it has been for the past 73 years, and renewables exceeded coal for the first time in approximately 140 years.

- There are about 3,300 power plants in the US that burn petroleum (aka [oil-fired power plants](#)) to generate electricity, or about 0.6% of the nation's total electricity in 2022. The small contribution of oil-fired power plants is due to several factors:

1. The efficiency of natural gas plant (45%) is much higher than petroleum (30%);
 2. Natural gas, solar, and wind are cheaper to operate compared to petroleum;
 3. Electricity generation from petroleum plants releases more air pollution compared to natural gas, nuclear, and renewable sources.
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- Universities in the Spotlight -

- Comparing the effectiveness of three primary sources of decarbonization policy — companies, state-level, and federal — [peer reviewed](#) research at the [UNLV School of Public Policy and Leadership](#) has found that state level climate policies are most effective (especially on behalf of energy efficiency), while federal policy is generally weakest.
 - The Computational Molecular Science and Engineering Laboratory ([CoMSEL](#)) at the **University of Notre Dame** supports classical and quantum mechanical simulations. (*Note: the program is looking for undergraduate and advanced graduate students interested in mathematical modeling and computer programming.*)
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- Quotes -

The energy transition ... a problem of scale.

"If we don't do a better job understanding the size and complexity of the energy transition challenge, we won't be able to meet it."

- Eric Toone, CTO for Breakthrough Energy

"We certainly should not become paralyzed."

- Jason Bordoff, founding director of the Center on Global Energy Policy at Columbia University, on thinking about the scale of the decarbonization challenge

"We'll be measured by scale."

- Bill Gates, the founder of Breakthrough Energy, when asked how Breakthrough Energy will be judged by future historians

- Bulletin Board -

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- **Orrick** published [2024 Offshore Wind Report](#). The report is an update on the current OSW market and trends in 20+ key jurisdictions with some forward looking analysis. AES Members have access to [Winds of Change](#).

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

- **Title Leader** launched a Title Commitments [platform](#) to support title searches by parcel.

- Gratitude -

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