

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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- The Power Read -

- **Oil - spotlight midstream:** Oil tanker rates are surging.
- **Renewables:** Virtually all global investment in renewables and storage is taking place in advanced economies and China.
- **Policy:** Democrats and Republicans in Congress are trying to figure out how to take full advantage of their small victories.
- **Spotlight - Global energy policy:** 3 crucial days could be consequential for energy markets: OPEC+ meets on Dec. 4; European Union's embargo on Russian crude oil begins Dec. 5; and, the G-7 price cap on Russian oil sales begins Dec. 6.
- **Climate:** Climate-tech software industry is surging.
- **Markets:** There is a new European ESG regulation called SFDR.
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- News from the Society -

- Attention all ".edu's": **AES has launched a new ["Digital Subscription"](#) program for universities and organizations.** For a limited time, we're offering discounts. [Contact us](#) for more information.

- *Coming soon:* **AES Energy Awards**, including the [Energy Writer of the Year 2022](#), the premier literary award for energy. Watch for other end-of-year publications, like Energy Awards, the Lighter Side of Energy, the Energy Year in Review ... and our annual [membership campaign](#).

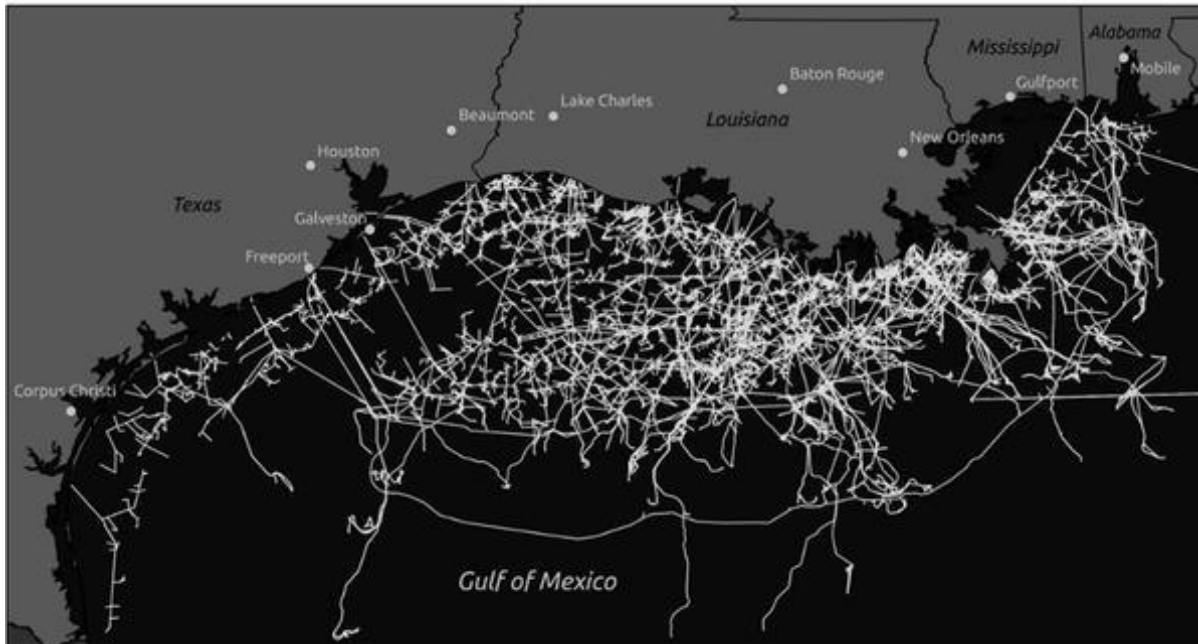
- Fossil Fuels –

- Spotlight: oil and gas, midstream and pipelines -



- On the eve of the EU embargo on Russian crude oil imports, oil [tanker rates](#) have risen to \$100,000/day. The higher cost of shipping crude is due to the longer voyages many tankers are making because of the EU sanctions; consequently, there aren't enough oil tankers to carry current volumes to meet demand.

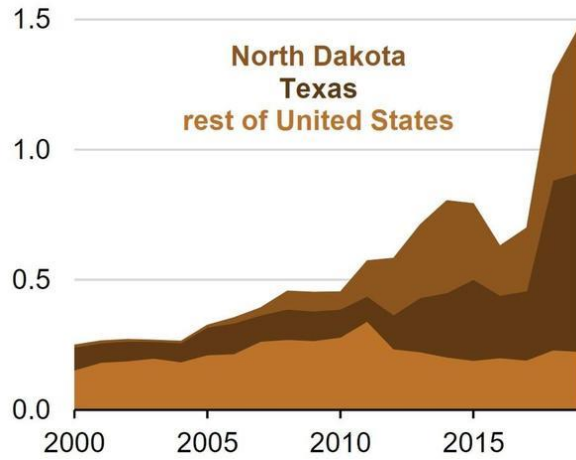
- A map of pipelines in the Gulf of Mexico:



- [Top-10 issues](#) facing the midstream industry (forced ranking), as per the [Center](#) for Midstream Management & Science:

1. Attracting new talent
2. Retiring expertise
3. Aging infrastructure
4. Regulatory/Permitting Compliance
5. Supply Chain
6. Political support for project development
7. Capital support for project development
8. Energy transition
9. Cyber Security
10. Mega Rule (Requires inspections within 72 hours of a weather event or disaster.)

- *Insert (right): A [comparison](#) of vented and flared gas across three US regions over the last two decades, by billion cubic feet per day. Summary: there was very little vented or flared gas in North Dakota from 2000 - 2010, but from 2011 - 2021 total vented and flared gas in North Dakota matched and then surpassed the total in Texas. To put that in context, North Dakota's output is about 1.4 million b/d, while Texas' crude oil output is more than 5.0 million b/d, or more than half of total US shale oil. (Note: vented and flared gas totals are usually underestimated, especially in North Dakota - AES [Members](#) have access to the peer-reviewed publication.)*



- Coal and mining -

- **Top-5 most valuable [mines](#) in the world, by ore value/ton (USD):**

Mine	Region	Primary owner	Minerals	Value/ton
1. Norlisk	Russia	Norlisk	Pd, Ni	\$513
2. Tenke Fungurume	DRC	China Molybdenum	Cu, Co	\$371
3. Kamoakakula	DRC	Ivanhoe/Zijin Mining	Cu	\$209
4. Mogalakwena	So. Africa	Anglo American Plat.	Pd	\$205
5. Olympic Dam	Australia	BHP Group	Cu, Au	\$104

No- / Low-Carbon and Renewable Energy

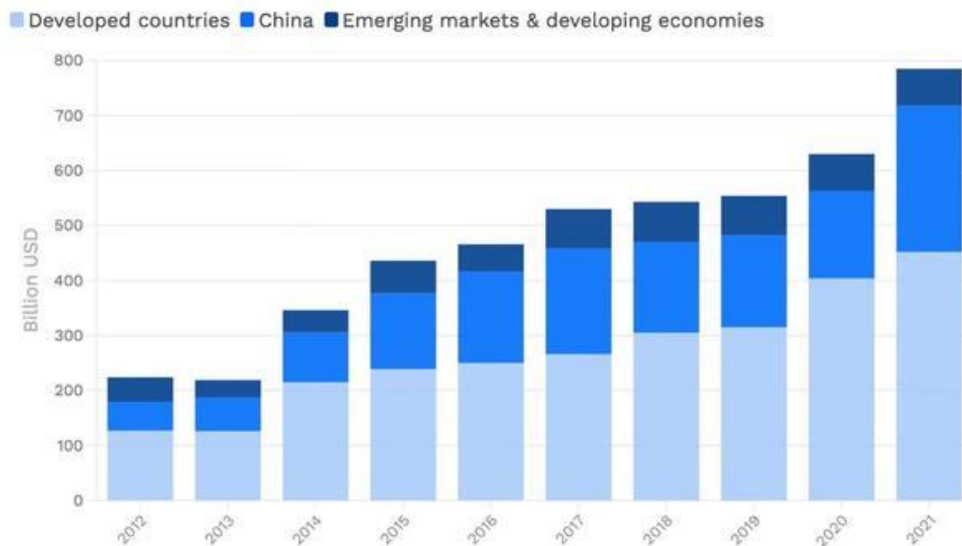
- **China is ranked #1 in the [global lithium-ion battery supply chain](#) for both 2022 and for 2027 projections. (China currently hosts 75% of all battery cell manufacturing capacity and 90% of anode and electrolyte production.) While China's top ranking hasn't changed for the last three years, **Canada is now #2**, which reflects public and private investments in mining activity as well as its good positioning in environmental, social and governance factors (ESG) and infrastructure. *Insert: top-10 global lithium-ion supply chains, by country.***

Country	Raw Materials	Battery manufacturing	ESG	Industry, innovation and infrastructure	Downstream demand	Overall ranking
China	1	1	17	9	1	1
Canada	3	8	6	4	10	2
US	6	4	16	5	2	3
Finland	9	15	2	1	11	4
Norway	18	10	1	3	7	5
Germany	21	6	4	7	2	6
South Korea	17	2	10	6	5	6
Sweden	21	9	3	2	8	8
Japan	13	3	8	12	8	9
Australia	2	15	9	10	11	10

- Every year on or around November 1, most hydro-electric dams in North America shift to "**Chum Operations**" — **when reservoirs switch over from refilling dams to extra releases** in order to increase the flows and elevation further downriver; of course, there is the hope that weather will help refill dams by adding river flows. AES Members have access to all AES reports, including its white paper on hydropower, [Water Works](#).

- France passed a [law](#) that will require solar-panel covers on all parking lots with 80 spaces or more.

- **Global investments in low-carbon energy technologies are at the highest in history** (eg \$785B in 2021, an increase of 24% y/y); however, investments in the same low-carbon technologies in developing economies is at its **lowest level** in 10 years, and far below the peak in 2012. In other words, **virtually all global spending on renewables and storage since 2020 has taken place in advanced economies and China**. *Insert: finance for energy transition low-carbon technologies, in billions of USD. (Note: emerging markets and developing economies includes most countries in South and Central America, Africa and Asia, excluding China, Japan and South Korea.)*



- Energy Policy & Geopolitics -

- Beltway Buzz -

- The absence of the anticipated "red wave" has sparked some recriminations among congressional Republicans.
- In the US House, presumptive Speaker Kevin McCarthy (R-CA) will try to marshal consensus among two competing wings within the Republican Party.
- Republicans' narrow control of the US House of Representatives provides a nominal check on President Biden's energy agenda, but some Republicans have already softened their criticism of his climate agenda.
- Democrats' control of the Senate offers a guardrail against any proposals that try to block implementation of the Inflation Reduction Act.
- Since control of the Senate has been decided, the biggest loser if the Democrats win the Georgia run-off on December 6 might be Senator Manchin because he will no longer have the power as the sole swing vote.

- Congressional Considerations -

- This will be a busy lame duck session for Congress.
- There are two marquee “must-pass” energy-related items—the National Defense Authorization Act (NDAA) and a government funding bill—as well as a host of loose ends, legacy items, and parochial priorities.
- Congress will try to pass a bipartisan omnibus bill that may include supply chain relief for automobile dealers under Section 473.
- Permitting reform legislation sought by Senator Joe Manchin (D-WV) (the sidecar deal to the Inflation Reduction Act) remains in play, though substantive concerns about the legislation among hard-line Democrats and Republicans have not been resolved.

- **AES recommends the Clean Energy and Climate Solutions Federal Funding [database](#)**, by Wilson Sonsini. (Editor's note: to our knowledge, this database is the only publicly available listing of clean energy and climate related federal funding opportunities across implementing federal agencies.)

- Global energy politics -



- Highlights from the 2022 UN Climate Change Conference (aka [COP27](#)). In general, not much happened at COP27, other than delegates having difficulty getting [food and water](#).

The top-6 [developments](#) at COP27:

1. Mexico announced it will install 30 additional gigawatts of annual electricity generation from wind, solar, geothermal and hydropower by 2030. For [comparison](#), Mexico currently has about 80 gigawatts of total electricity generation capacity, the majority from natural gas, while renewables account for 10% and hydropower 7%.
2. The US and China restarted stalled climate change negotiations.
3. France, Germany, UK, US, and the EU will commit \$8.5 billion to finance South Africa's deployment of electric vehicles and green hydrogen.
4. Indonesia announced the planned retirement of a coal-fired power plant with assistance from the Asian Development Bank.
5. Pakistan sent an unusually large delegation, most of whom advocated for humanitarian aid and greater support for climate justice. *Note:* With floods that submerged a third of the country, Pakistan became a prime example of the devastation that can be caused by the changing climate.
6. The world's most climate-threatened countries won a historic first — securing a [Damage Fund](#) that will pay for damages caused by changes to the climate.

- Next week could be consequential for energy markets: OPEC+ meets on Sunday, December 4; European Union's embargo on Russian crude oil begins Monday, December 5; and, the G-7 (led by the US) price cap on Russian oil sales begins on December 6.

- Climate and Sustainability -

- The acts of sabotage on the Nord Stream 1 and Nord Stream 2 pipelines that run from Russia to Germany beneath the Baltic Sea released about 220,000 metric tons of [methane](#). As a point of comparison, in 2015/16, leaks in the Aliso Canyon natural gas storage facility released about 97,100 metric tons of methane, which US climate scientists described as "massive." In contrast, researchers with the Chinese Academy of Sciences determined that the leaks in the Nord Stream 1 and 2 pipelines were "tiny" and that "there is no need to worry about the climatic impact of this leaked methane." AES Members have access to the [research](#) reviewed by the Chinese Academy of Sciences.

- The global economy may be slowing and social media companies may be unraveling, but [climate-tech software](#) is surging. Indeed, VC investment in [climate tech](#) was up 80% from 2020 to 2021, and 64 new climate funds were formed last year, worth a combined \$37B.

- *Insert (right): A comparison of national contributions to the \$100bn climate finance target established at the COP15 summit in 2009. Note: national financial commitments were tied to each country's respective share of historical emissions. [Summary](#): The US, Canada and a handful of other nations have fallen short of contributing their "fair share," while other countries are exceeding their fair share of financing, such as Japn, Denmark, Ireland, and Sweden.*



- Research and Markets -

- While ESG has received criticism in recent months, it's not going away. In fact, a new European ESG regulation called the Sustainable Financial Disclosure Regulation ([SFDR](#)) makes sustainability disclosure mandatory for funds in the EU.

- **The world still has an insatiable appetite for more energy.** A historical [comparison](#) to consider: In the 1970s (during the Arab Oil Embargo), ~60 million barrels of oil per day were produced; today, daily oil production is about ~90 million barrels bpd.

- Hot new company: **French company [Fairmat](#) recycles and reuses carbon fiber composites.**

- Spotlight: [Lillianah Technologies](#) works with university research groups to help push decarbonization technologies to market and at scale, with special emphasis on ocean tech. *Note: Lillianah's methods were developed at Rice University and San Diego State University.*

- AES recommends a [video](#) about the **US Registered Apprenticeship Program (RAP)**, which prepares union workers for the new energy economy.

- Electricity & Power -

- On average, **US electricity customers experienced just over seven hours of electric power interruptions in 2021**, almost an hour less than in 2020. When major events—including snowstorms, hurricanes, and wildfires—are excluded, the average duration of interruptions annually remained consistently at around two hours per year from 2013 to 2021. [State comparisons](#) include:

- Electricity customers in the District of Columbia, Delaware, Florida, North Dakota, and Nevada had the shortest total time of electricity interruptions in 2021, ranging from 52 minutes in the District of Columbia to 102 minutes in Nevada.
- Customers in Louisiana, Oregon, Texas, Mississippi, and West Virginia experienced the most time with interrupted power in 2021, ranging from almost 19 hours in West Virginia to over 80 hours in Louisiana.
- Louisiana also had the highest number of power interruptions, followed by Texas.

- In the history of Texas' ERCOT (founded in 1970), [all of its top-10 peak demand events took place this year](#) (pdf).

- **California has the most utility-scale battery storage capacity in the US**, with about 3.2 GW of batteries on the grid this summer—as a point of comparison, this is more than Diablo Canyon Nuclear Plant's capacity. (Note: battery storage saved the CAISO grid a few times this summer.)

- This past summer was the warmest on record in most Western States (temperatures were well above average in the MISO region, Texas, and across the West). **The region most at risk this year was in MISO**, which under normal summer conditions would not have been able to meet demand, except that it was windier than normal, allowing wind energy to provide 13% of total power for MISO.

- **There is early evidence that new system-wide emergency text messaging yields about .5% of almost instantaneous demand reduction** at any given moment. (For instance, in CAISO this summer, one warning text immediately saved about 2.5 GW out of a total 50 GW.)

- Universities in the Spotlight -

- **James Madison University:** [Engineering students](#) work to offset the litter crisis.
- **Emory and Henry:** AES celebrates the [Climate Collaborative](#) which houses the country's only solar-powered college radio station.
- **University of Idaho** has a landslide inventory [database](#) to support hazard mitigation.
- **UNC Chapel Hill Kenan-Flagler Business School** [primer](#) on energy security canons.
- **University of San Diego:** AES applauds the USD Energy Policy Initiatives Center's regional decarbonization [framework](#) and carbon offset efforts.
- **Santa Clara University** develops comprehensive sustainability [programs](#) focusing on community college students.
- **University of Stavanger, Norway**, has installed as a pilot the first gas [turbine](#) powered by pure hydrogen.
- *Spotlight:* **University of Calgary** opened its [Energy Transition Centre](#).
- **Drexel University** [research groups](#) cover a range of energy topics including: photovoltaics, renewable polymers and fuels, materials for energy storage....

- Quotes - Orwellian doublethink

The US EPA is considering a proposal to curb methane. The new plan would require monitoring of 1 million well sites, emissions reduction from flaring equipment, and a system that detects leaks from "super-emitter" sites. Not surprisingly, **the industry has opinions about federal regulation of methane emissions.**

"The Chamber supports smart, balanced regulations and voluntary actions to reduce methane emissions from the oil and gas sector."

- Marty Durbin, President of the US Chamber's Global Energy Institute

"Federal regulation of methane crafted to build on industry's progress can help accelerate emissions reductions."

- American Petroleum Institute (API) Senior Vice President of Policy, Economics and Regulatory Affairs
Frank Macchiarola

"... High fuel costs punish middle class families & stoke the supply chain crisis. Texas oil & gas is needed right now."

- [Tweet](#) by Governor [@GregAbbott_TX](#), opposing the EPA proposal to limit methane emissions

- Bulletin Board -

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- February 7 and 8, 2023, **Business Sweden** is hosting a [two-day training](#) on the Swedish battery ecosystem in Stockholm, Sweden. The training is partially subsidized with a minimal participation fee of 15,000 SEK (~US\$1,450); deadline to register is January 24, 2023.

- Don't miss two new resources from [Our Energy Policy](#):

- [Securing New York's Energy Future](#) - summary and recording featuring NYSERDA President Doreen M. Harris.
- [Hydrogen and the Energy Transition](#) - summary and recording featuring speakers from the U.S. Department of Energy, Fuel Cell and Hydrogen Energy Association and National Grid.

- **Honeywell Building Technologies** is hiring a [Solution Consultant Manager](#) and a [Sustainability Break Through Initiative Leader](#) (GM).

- **Wood PLC** published "[Repurposing gas infrastructure for hydrogen - dream or reality?](#)"

- Don't miss the **Climate Partnership [Playbook](#) by the State of Green (Denmark).**

- **Clearpath** has completed a white paper that examines the development of wind power in [Iowa](#), the #2 wind state in the US. The study highlights proponents and advocates of the industry and its plans to expand in the future.

- **Unearth** is a dynamic Mobile GIS that connects assets, data, and field teams for critical infrastructure providers. Start your [free](#) trial today.

- **Ubiquitous Energy**, a leader in transparent solar technology, is [developing](#) energy generating windows and door products.

- **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

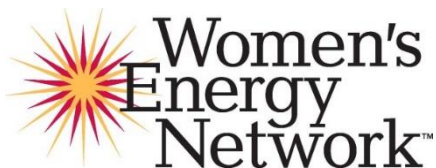
- Gratitude -

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