

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

AN OFFICIAL PUBLICATION OF



AMERICAN ENERGY SOCIETY

June 13, 2022

- The Power Read -

- **Fossil:** Oil-tanker rates set historic records.
- **No-/low-carbon:** Auxin Solar's tariff petition impacts the industry.
- **Policy:** Preparing for a Berlin air lift-like GasLift.
- **Markets:** The DoD is seeking prototyping proposals.
- **Climate:** 421 PPM - a new world record.
- **Breaking:** An explosion at the Freeport LNG export terminal.
- **Universities in the Spotlight: Hydrogen RD&D.** (Note: AES will soon publish its next report, *H2 SME Watch-List*, offering special insight into the 2,000 thought leaders shaping the future of hydrogen. [Contact us](#) if you would like to know more about or get a sneak peek of the report *H2 SME Watch-List*. AES Members receive the H2 SME dataset for free.

- News from the Society -

- July 7–8, the 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.

Today is the last day ... [join](#) AES at 60% off (or, \$47/year)!

- Fossil Fuels –

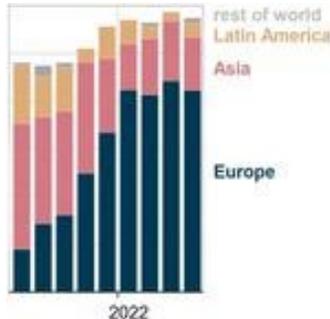
- Oil -

- *Special report, comparison of oil tanker rates* (by region, USD metric tons, and month):

<u>Trade route</u>	<u>January 2022</u>	<u>April 2022</u>
Aframax "dirty tanker" Black Sea	\$10.11	\$32.10
Northern Europe Baltic Sea	\$7.50	\$41.38
UKC/Mediterranean	~ \$12.00	\$48.49
Intra-United States charter rate	~ \$25,000	\$65,000

- Gas -

- **Breaking:** There was an [explosion](#) at the **Freeport (Louisiana) LNG export facility**. The plant is expected to be off-line for three weeks. The terminal handles about 20% of total US LNG exports; it will now be much more difficult to refill Europe's LNG tanks before the winter heating season. (Editor's note: it is unknown if, or to what degree, Europe's demand for LNG strained the capacity of the Freeport export facility.)



- **US exports of LNG to Europe have been [increasing](#) significantly since August 2022**, even before Russia's invasion of Ukraine; meanwhile, exports to Asia and Latin America have decreased. *Note:* see "GasLift" in the [Policy](#) section of this issue.

- Mining, Minerals and Coal -

- **Two opposing expert views on the lithium mining market:**

- Goldman Sachs: the lithium market will "pivot towards a prolonged phase of surplus capacity starting this year."

On the other hand ...

- [Benchmark Minerals](#): "Capacity does not equal supply."

- Carbon Capture -

- **Almost no crops or vegetation [grow](#) in the soils of abandoned coal mines in Appalachia**, except perennial [tall-grass](#) (*Miscanthus x giganteus*) and a few microbes, both of which are regenerating damaged soils.

No- / Low-Carbon and Renewable Energy

- The Biden administration will use the "Defense Production Act" to end the US Commerce Department's tariff investigation of Chinese manufacturing and trade. However, **Auxin Solar's tariff petition delayed 80% of all planned or new solar projects** (source: ACORE Finance Forum [6.7.2022](#)) and 450 MW of developments were [canceled](#). *Note:* see "Defense Production Act" in the [Policy](#) section of this issue for more context.

- Related, **BloombergNEF says that Auxin Solar [misused](#) the data they provided Auxin in their petition** to the US Commerce Department requesting an investigation of Chinese solar export practices.

- Related, AES Members have access to the **US Commerce Department [memo](#)** that initiated the Auxin Solar request for an investigation of China's solar panel trade practices.

- **China, the world's biggest lithium battery manufacturer, has about 72% [market share](#)** (*note:* it was about 60% in 2018). For comparison, US manufacturers have about 8.5% market share.

- The Biden Administration **increased** the required amount of biofuels that have to be blended into the US gasoline and diesel supply (also known as the Renewable Fuel Standard, or RFS). *Note:* the corn lobby is unhappy that the total amount is not higher, while the oil lobby is unhappy that the RFS wasn't cut.

2020: 17.13 billion gallons

2021: 18.52 billion gallons

2022: 20.63 billion gallons (15B gallons ethanol + 5.63B gallons advanced biofuels)

- Related, the US DoE launched **Scale-Up of Integrated Biorefineries FOA**, which provides \$59M to support RD&D of biofuels and bioproducts (deadline: July 8, 2022).

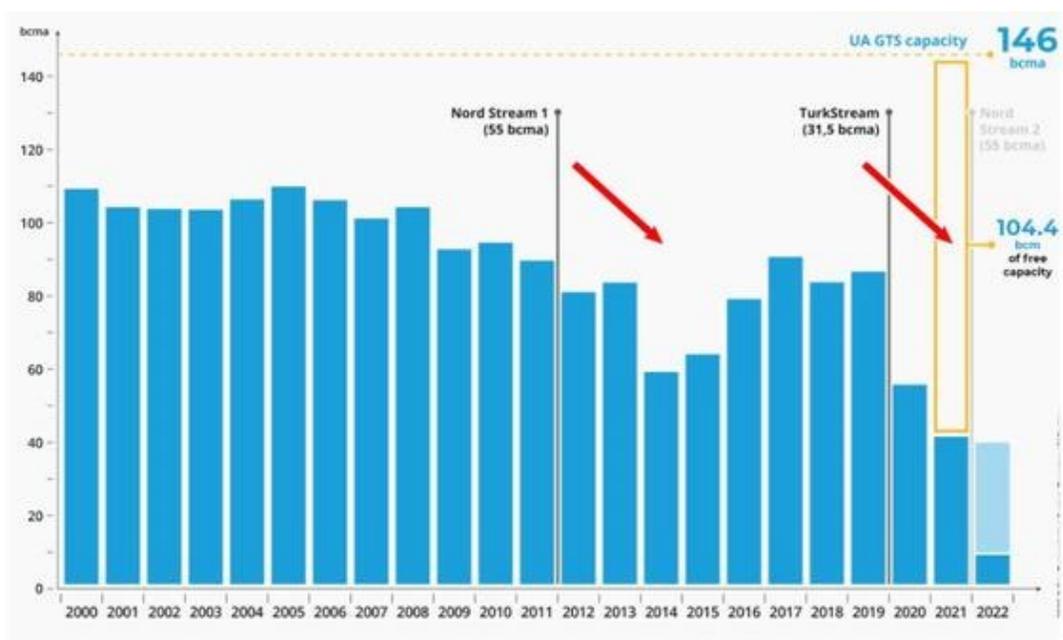
- The Columbia Center on Sustainable Investment (CCSI), in partnership with E3G, an independent climate-change think tank, is conducting a **survey to better understand the economic, financial and regulatory factors that drive and/or limit the necessary domestic and foreign investments in renewable energy sectors**. (*Editor's note:* please participate in this formal [survey](#) only if you are a professional in the renewable energy industry.)

- Energy Policy & Geopolitics -

- *Special report:* The Biden administration will use the "[Defense Production Act](#)" to **end the US Commerce Department's tariff investigation of Chinese manufacturing and trade** that effectively froze the solar power industry in the US. The investigation will continue, but solar panels will be allowed to be imported from Cambodia, Malaysia, Thailand, and Vietnam for two years without risking retroactive tariffs.

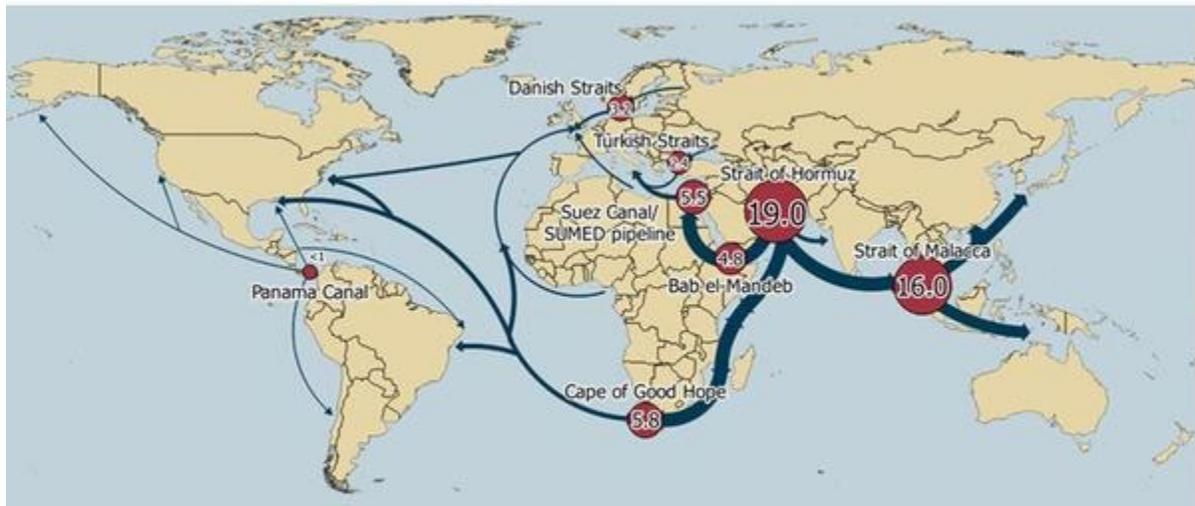
- *Special report on the Berlin airlift-style "GasLift" to Europe:* Western Europe is determined to reduce imports of LNG from Russia; meanwhile, Russia has threatened to terminate *all* natural gas supplies to Europe. To prepare for winter 2023, it appears that US and Qatar producers are preparing to use 8 to 10 vessels to [relocate](#) their cargo to LNG terminals in Northern Europe. However, this is NOT a long-term solution because non-European buyers do not support the LNG relocation GasLift.

- Two years before its full-scale military invasion, **Russia was already waging an energy war against Ukraine**. *Insert below:* annual volume of gas in transit from Russia to Ukraine (in bcm); the Ukraine route was at 30% capacity two years prior to the invasion.



- **OPEC+ is still producing less oil than its monthly target.** Nigeria, Angola, Equatorial Guinea, and Congo are producing [well below](#) their quotas, while Saudi Arabia, the UAE, and Kuwait have spare capacity but have had no change in production. Only Russia increased production.

- *Spotlight*, global oil trade: **About 60% of the world's petroleum moves along maritime routes.** The Strait of Hormuz and the Strait of Malacca are the world's most important and most at-risk chokepoints by volume of oil transit and potential for geopolitical conflict.



- Climate and Sustainability -

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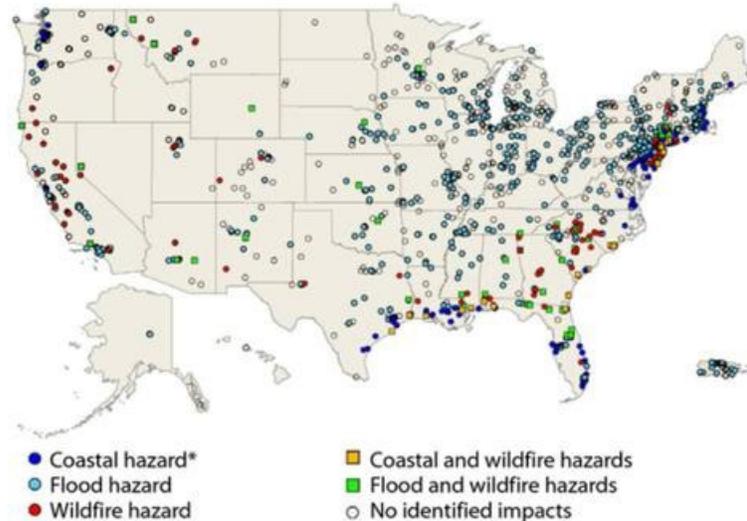
- The [amount of CO₂](#) in the atmosphere right now. For context, this is the highest recorded measurement in the last million years and the first time the total is more than 50% higher than the pre-industrial era.

- Since 1980, oxygen levels at the surface of freshwater lakes have dropped 5.5% (and 18.6% in deeper water). [AES Members](#) have access to the peer-reviewed research.

The 5 largest US lakes with the highest levels of deoxygenation:

- Lake Michigan
- Lake of the Ozarks (Missouri)
- Lake Mead (Colorado River; Arizona/Nevada)
- Mono Lake (Southern Sierra Nevadas, California)
- Lake Erie

- *Insert:* Superfund sites at-risk due to changes in the climate (such as wildfires, hurricanes, coastal flooding, etc.).



- Each passenger flying from San Francisco to London is responsible for about 1 metric ton of CO₂ – about half the emissions that a citizen in India releases in a year.

- Research and Markets -



- Right now, the retail price for a Ford Mustang Mach-E is about \$45,000; the battery pack alone costs Ford \$18,000 to build. However, **the automotive industry expects an EV price war to begin in 2024/25**, which will lower the overall average sticker price of a standard EV from \$45,000 to about \$25,000.

- Related, driving an electric vehicle costs around \$1.41 per gallon-equivalent vs. \$4.67/gallon for a gasoline-powered car with an ICE (US averages, as of June 1, 2022). **The states where driving an EV is most economical** (in terms of money saved/gallon):

1. Washington (\$4.23/gallon equivalent)
2. Oregon (\$4.13)
3. Nevada (\$4.00)
4. Idaho (\$3.77)
5. Utah (\$3.68)

- **The DoD is currently seeking prototyping proposals in the following areas:**

- Autonomous mobility
- Power and specialized sensors
- Advanced batteries
- Hydrogen storage technology
- Hypersonic rocket engines and fuel
- Quantum refrigeration

- **Pemex is building its first refinery in Tabasco, Mexico. It will be operational by the end of the year;** however, the construction of the Dos Bocas Pemex oil refinery is already about \$4B over budget.



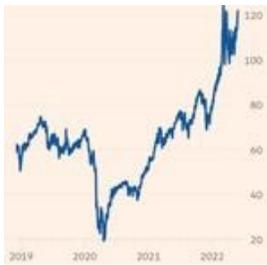
- AES applauds the materiality [calculator](#) by SASB Standards. This calculator helps identify sustainability information that is financially material for investors who are concerned about ESG (environmental, social, and governance).

- Electricity & Power -

- About 88% of all US households use [air conditioning](#). Two-thirds of those use central AC or a central heat pump as their main AC equipment.

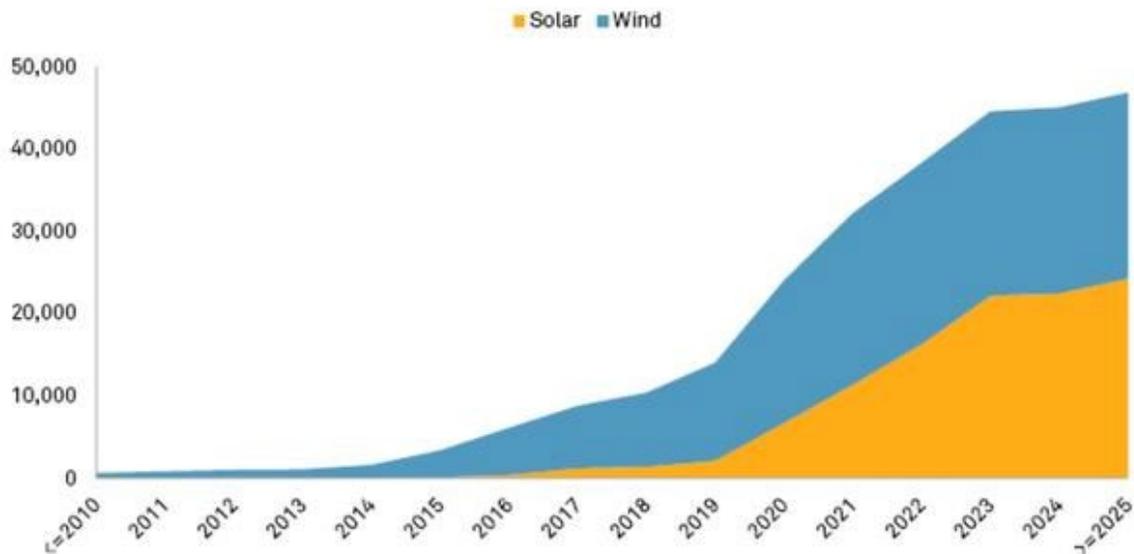
- The US DoE closed on a \$504 M [loan guarantee](#) for the Advanced Clean Energy “green” hydrogen storage project in Utah.

- Causes of the current global fuel shortage:



- COVID pandemic and reduced demand
- Supply-chain breakdown
- Russia's invasion of Ukraine
- OPEC and market manipulation
- **Primary cause: lack of investment** (refineries, pipelines, IMEX hubs, E&P, etc.). *Insert:* oil above \$120/barrel, in Brent crude USD.

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- Solar will soon overtake wind as the preferred renewable energy technology for US corporations. *Note:* three years ago, solar accounted for only about 16% of total renewable energy contracted by US corporations. *Insert:* cumulative and comparative corporate wind and solar capacity in the US.



- Universities in the Spotlight - Hydrogen RD&D

- **UCLA** engineers have developed a [solar thermal solution](#) that turns methane into hydrogen.
 - **University of Wyoming** has launched the Hydrogen Energy Research Center ([H2ERC](#)).
 - **University of Louisiana at Lafayette**, **University of Oklahoma**, **University of Arkansas**, and **Louisiana State University**, have established a collaborative regional hub for RD&D of clean hydrogen as a fuel and manufacturing feedstock.
 - **Solar Turbines** donated a 3.5-megawatt turbine engine to **Colorado State University** to support hydrogen combustion research at the CSU Energy Institute.
 - **Penn State** has developed a method to purify hydrogen from heavy carbon monoxide.
 - **Stanford University** launched a research initiative on hydrogen.
 - The National Fuel Cell Research Center at **UC-Irvine** set a record for hydrogen dispensed at the UC Irvine Hydrogen Fueling Station.
 - **University of British Columbia** is launching a research program on hydrogen fuel for transportation, with special emphasis on the hydrogen supply chain.
 - **University of Alberta** is developing a Hydrogen Roadmap for its province.
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- Quotes - The price of energy

"Crude oil is \$120 per barrel, but the product price — what you and I pay — is much, much higher. The overarching theme is the lack of investment. We are in this [high oil prices] for the long haul ... potentially a decade."

- Amrita Sen, Energy Aspects

"I believe our industry is definitely heading toward a huge price war."

- Ford CEO Jim Farley, on anticipated retail prices for EVs in 2024

"They need a lot of financing."

- Richard Rys, ARC Advisory, on the [IPO](#) by NuScale, manufacturer of small modular nuclear reactors, even though their first SMR won't be operating until 2029

- Bulletin Board -

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

- **ClearPath** is looking for either an upcoming graduate or undergraduate with relevant experience to join its [policy](#) team as a 2022-2023 Policy Fellow. The fellow will work to advance the entire suite of clean energy technologies.

- **Ubiquitous Energy**, a manufacturer of transparent solar products, has a new [partnership](#) with Citrine Informatics, an artificial intelligence service provider for materials development.

- If you have [data](#) but not the talent or staff to make it valuable, please consider the **proSkale** platform— it helps organizations manage and invest their data ... like cash.

- [Free eBook](#), *Ground Robots for Autonomous Operations in Oil & Gas*.

- Gratitude -

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