

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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AMERICAN ENERGY SOCIETY

July 25, 2022

- The Power Read -

- **Coal:** Setting all-time global records in generation but not output.
 - **Policy:** Senator Manchin and President Biden catch everyone off guard.
 - **Climate:** Heat waves in the Northern Hemisphere are a single weather event.
 - **Markets:** Japan is experiencing an energy crisis.
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- Fossil Fuels -

- Oil -

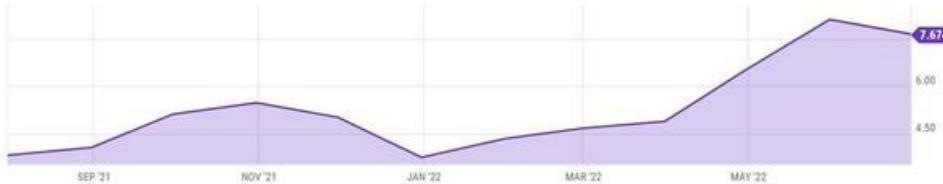
- Spotlight on National Oil Companies (NOCs):

- Definition: An oil and gas company fully or mostly owned by a national government.
- About 65% of the world's proven oil and gas reserves are under the control of NOCs; in 2010, NOCs controlled about 75% of total oil reserves.
- In the last ten years, NOCs have made 41% of all new oil and gas discoveries (accessed as conventional resources).
- A sample of the largest NOCs (by total oil produced); those on the list represent more than 1/3 of total global oil production:

Saudi Aramco	Pemex (Mexico)	Sonangol (Angola)
Petroleo Brasileiro (Brazil)	Gazprom (Russia)	Indian Oil Corp.
Qatar Petroleum	Rosneft (Russia)	Kuwait Petroleum Corp.
National Iranian Oil Co.	Petronas (Malaysia)	Nigerian National Petroleum Corp.
Abu Dhabi National Oil Company (UAE)	Sinopec (China)	Petroleos de Venezuela (PDVSA)
	CNPC (China)	<i>(Note: the PDVSA controls the largest proven reserve in the world)</i>

- Gas -

- In the last 12 months (July to June), the average price for natural gas has nearly doubled (Henry Hub spot price, the US benchmark).



- Mining, Minerals and Coal -

- In 2021, global coal-fired power set an all-time record (10,244 terawatt-hours); **that global record will be shattered in 2022** — China and India account for more than 70% of growth. Meanwhile, in the US, about 11.5 GW of coal will be taken offline this year, or about 5% of the US coal fleet. (Note: total global mine output is nowhere close to its all-time record because older and less efficient coal-fired power plants have been replaced by newer and more efficient ones.)

- Carbon Capture -

- The DoE has launched a beta version of Carbon Matchmaker to help CO₂ suppliers and users find each other and form carbon management "teams."



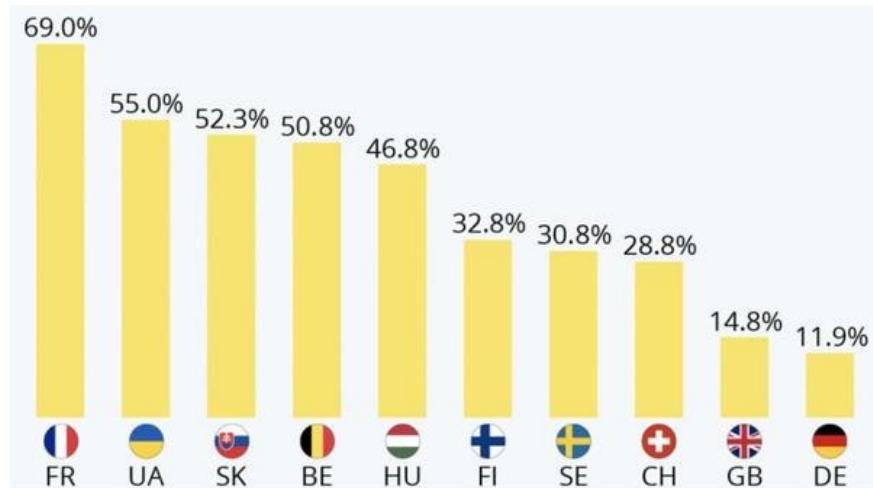
No- / Low-Carbon and Renewable Energy

- *AES trend spotting insights:* "nuclear" is the most active topic in energy technology right now. Moreover:



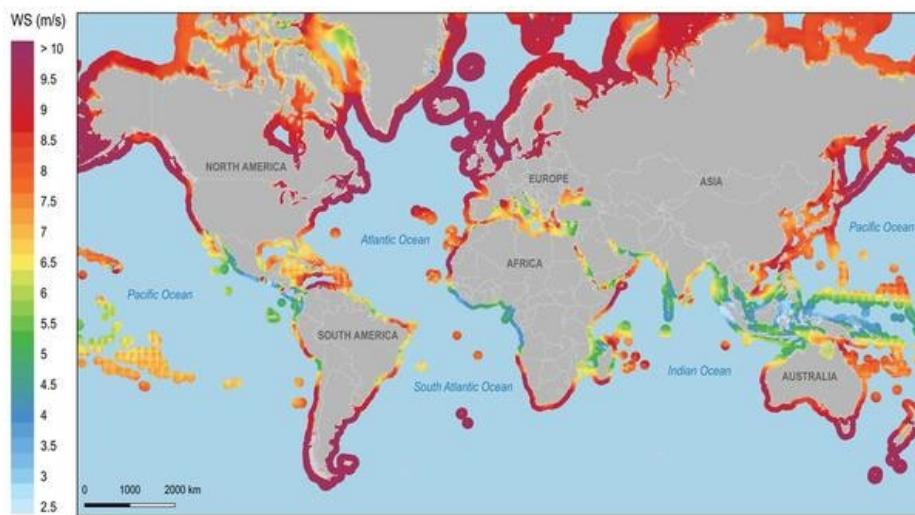
- The IEA is seeing a "resurgence" of policy interest in support of nuclear power.
- German Chancellor Olaf Scholz supports keeping nuclear power plants in operation.
- The China National Offshore Oil Corp is investing in the development of SMRs.
- In the US, popular support for nuclear power might be at an all-time high.
- According to AES engagement data, the most popular topic among AES Members and Friends is "energy crisis in Europe" and "Manchin" (tie) followed by "nuclear" — contact us for more information on AES trend-spotting analytics.

- Countries most reliant on [nuclear power](#) for electricity generation:



- Offshore wind, a [primer](#):

- Total worldwide offshore wind power capacity = 35.3 gigawatt (GW).
- United Kingdom (29%), China (28%) and Germany (22%) account for more than 75% of the global installed capacity.
- Denmark produces the most offshore wind power (as a percentage of total electricity).
- The 1.2 GW Hornsea Project One in the UK is the world's largest offshore wind farm.
- One full rotation of a wind turbine will power a typical home in the west for one full day.
- Recommended insert: Global average [offshore wind speeds](#) (in m/s):



- Sunrun is preparing to dispatch about 150 megawatts of stored battery capacity to [support grid resilience during severe weather conditions](#) this summer; its customers are already providing grid support in 3 RTOs (MISO, CAISO and ERCOT) across 12 states. (*Editor's note:* as always, there has been no compensation exchanged for this information.)

- Energy Policy & Geopolitics -

- *Beltway buzz:* Usually, Washington DC slows down during the summer, especially with temperatures rising. However, **Joe Manchin and the President's trip to Saudi Arabia made for an eventful political July:**

- Senator Manchin caught everyone off-guard when he announced that he would oppose legislation he initially supported (fighting inflation > fighting climate change)
- President Biden suggested a similar position for the White House (energy crisis > climate change).
- At this point, if the current 117th Congress is going to consider any climate legislation, it will probably get bumped to the lame duck session (any time between the day after the November 8, 2022 off-year election and before the seating of the new Congress in January, 2023, when it is politically safer to offer bipartisan support).

- Since 2011, the US EPA Office of Enforcement and Compliance (the federal agency responsible for enforcing environmental laws) has had **agency funding cut by 30% and workforce cuts by 28%**.

- California Governor Gavin Newsom is preparing to give PG&E state and federal funds in order to keep the Diablo Canyon [nuclear power plant](#) in service.

- **Russia's war in Ukraine has reshaped oil markets.** Europe is now importing [more US oil](#) than Asia, and there might not be enough US oil for both Europe and Asia during the winter once the European Union embargo on Russian oil takes effect later this year.

- Climate and Sustainability -

- **Heatwaves across the northern hemisphere, a few examples:**

- [Southern Europe](#): [wildfires](#) from Portugal to the Balkans have forced evacuation of villages.
- Britain recorded its [highest](#) temperature ever (40.2 C, or 104.4 F), and [Portugal](#) did, too (47 C or 117 F).
- [China](#): heat and flooding is forcing 100,000s of people to relocate ... and a museum roof melted.
- [Northern India](#): In May, temperatures reached 49°C (120°F), a record that has been broken many times since.
- The heat wave in [Japan](#) is its worst on record (in terms of heat, intensity and duration).
- [Texas](#): Extreme high temperatures are straining ERCOT.

- The heat wave across the entire northern hemisphere (from Asia to North America to Europe) is [connected](#) by a single jet stream that also cuts across the two oceans (the Pacific and Atlantic).



- **July 28th** is Earth Overshoot Day, a day when humanity has used up all the biological resources that Earth regenerates during the entire year. In 2021, Earth Overshoot Day was July 29th.

- Communities that replace dark surfaces — like streets, rooftops, playgrounds and parking lots — with lighter and cooler alternatives can [lower "heat island" temperatures by 5°F](#), and the overall total can feel up to 15°F cooler.



- The status of the monarch butterfly has been [reclassified](#) from "endangered" to "the edge of collapse" (note: the population has declined by about 99.9% from 1981 to the present).

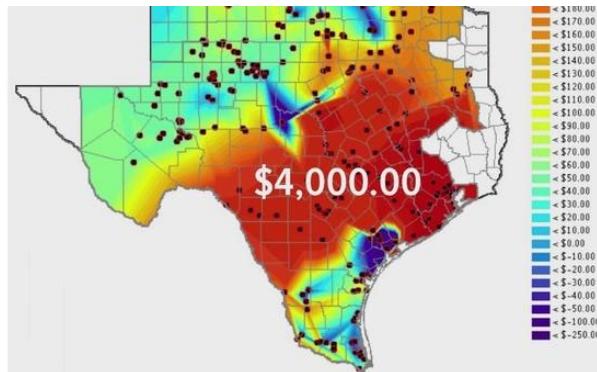
- Research and Markets -

- Almost all weather forecasts and emergency response systems are based on historic weather patterns that are no longer relevant; the National Center for Atmospheric Research has developed a new **machine learning approach** that offers [improved forecasts](#) by focusing on data about recent winter and spring climate conditions.
 - Valero Energy Corp., Marathon Petroleum Corp. and Phillips 66 — the three largest independent refiners in the US — will set **all-time "cash from operations" revenue records in Q3 2022**.
 - **About 60% of Mexico's total fuel demand (gasoline, diesel, and other fuels) is stuck off its coasts** due to storage, refining, supply chain, and labor [shortages](#). (Note: fuel importers pay about \$40,000/day (USD) per shipping vessel waiting in line to unload.)
 - **Japan is facing a very serious energy crisis.** The yen has fallen to its lowest in 20 years while crude oil and other energy prices are rising. Consequently, this year the price of oil increased about 70% in Japan (for comparison, it has increased about 40% in the US).
 - **Ilan Gur**, founder and CEO of Activate (formerly, Cyclotron Road), is the first chief executive officer of the newly established [UK Advanced Research and Invention Agency](#).
 - Natural gas leaking out of home appliances like kitchen gas stoves, furnaces, and water heaters is mostly methane, but recent research discovered **traces of 21 other toxins and carcinogens** like benzene and hexane; however, the gas poses less risk than the second-hand smoke from one cigarette. [AES Members](#) have access to the peer reviewed research.
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- Electricity, Power, Efficiency, and the Grid -

- **About 14% of all homes in the US use electricity as the only source of energy** (note: most US homes use electricity and at least one other fuel, such as natural gas, oil, propane, or wood). Florida has the most homes (77%) using electricity as the only source of energy, Hawaii has the second most all-electricity homes (72%), followed by Washington, Arizona, Tennessee, North and South Carolina, Alabama, and Louisiana.
- In the UK, natural gas prices are used to dictate all wholesale electricity prices regardless of how the power is generated because natural gas is considered the most reliable or "last" source of supply to meet demand. However, natural gas prices have increased faster than all other sources (including solar, nuclear, and especially offshore wind, which is at an all-time low of £37.35 per megawatt hour). **The new UK government is considering whether renewables, rather than natural gas, should be used to set energy prices.** [AES Members](#) have access to a preliminary draft of the review document.

- This summer, the [average cost of electricity](#) in Texas (ERCOT) reached \$1,664 per megawatt hour; however, the price in Houston was much higher. (Normally, the price of electricity in Texas is \$40 - \$70 / MWh.)



- In India, the annual per capita income is about 91,000 rupees; the average cost of an air conditioner in [India](#) is about 22,000 rupees (or about 25% of total annual income).
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- Universities in the Spotlight -



- AES applauds the [ReMADE Institute](#) at RIT, a consortium of 33 participants from academia, industry and national laboratories working together in support of the circular economy (defined as material recycling, recovery, remanufacturing and reuse).
 - Emory and Henry College, in collaboration with William & Mary, is offering a new course in [blockchain technology](#) for entrepreneurs in energy and agriculture.
 - The Energy Policy Institute at the University of Chicago is looking to hire a [communications/digital media manager](#).
 - The Tulane University [Master of Management in Energy](#) placed 93% of its graduates in professional positions.
 - The Idaho National Lab, Boise State University, and Drexel University are working on a [collaborative project](#) involving wastewater purification.
 - The Energy Policy Center (EPC) at Cleveland State University has developed a [roadmap](#) in support of energy storage in Northern Appalachia.
 - The CERC research team at the University of South Florida (USF) is working with the University of New South Wales in Australia and Florida Polytechnic University to improve window materials that can increase building energy efficiency.
 - CEES researchers at Wake Forest are [helping ranchers](#) in Montana.
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- Quotes -

In consideration of US Senator Joe Manchin (Democrat from West Virginia)

"He may be craven, but he's not stupid. And he knows that we've got one shot at budget reconciliation left, and we've got a problem in the [Affordable Care Act] that we have to resolve this month. So, when he talks about 'We can get back around to climate later,' I hope no one is foolish enough to try to kick the football one more time."

- US Representative Jared Huffman (D-CA)

"It is a gut punch but not a surprise. Anyone who understands who Mr. Manchin is ... and what he actually cares about can't really be surprised."

"Why are we sitting here right now, with all the facts on the ground, in this position? It's because of the power of the money in our political system. So, am I concerned that it will be a decade before we have a climate majority? I am damn concerned about that."

- Sen. Jeff Merkley (D-Ore.)

"We just have to work together. We can't go too far left. This is not a center-left or a left country. We are a center, if anything, center-right country."

- Senator Joe Manchin

- Bulletin Board -

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- Applications are now open for the **Mária Telkes Fellowship**, a 2-year program to champion mid-career cleantech professionals from underrepresented communities and demographics to promote executive leadership.

- **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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