

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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April 17, 2023

- The Power Read -

- **Coal and mining:** The mining industry is generating extraordinary revenues but not investing in expansion.
- **Low-carbon:** The Hydrogen Hub competition (\$7B) is down to its final 23 contestants.
- **Low-carbon II:** This could be hydropower's best year ever.
- **Policy:** The Shanghai Cooperation Organization (similar to NATO but for Eurasia) is almost entirely focused on oil and gas.
- **Climate:** Earth Day is Saturday, April 22.
- **Climate II:** Three Sisters symbiotic crops deserve more research.
- **Electricity:** HVDC is gaining momentum.

- News from the Society -

- The energy sector is hiring! There are 100,000s of unfilled jobs. [Contact us](#) if you are curious about new professional opportunities, like 100s of job openings at [Schneider Electric](#).

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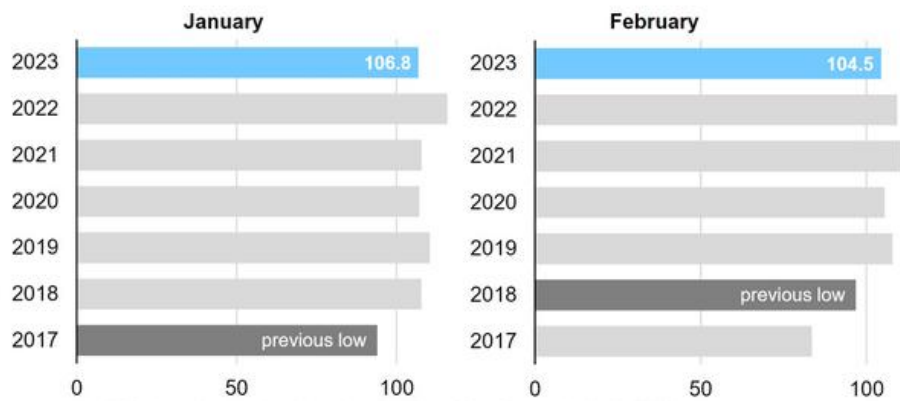
- Fossil Fuels -

- Oil -

- When Q2 2023 opened, oil prices were in decline; however, global oil demand is on pace to set another [record high](#), while OPEC+ surprisingly scheduled a production [cut](#). It is not a stretch to imagine that **in 2023, the oil and gas sector will set new annual revenue records again.**

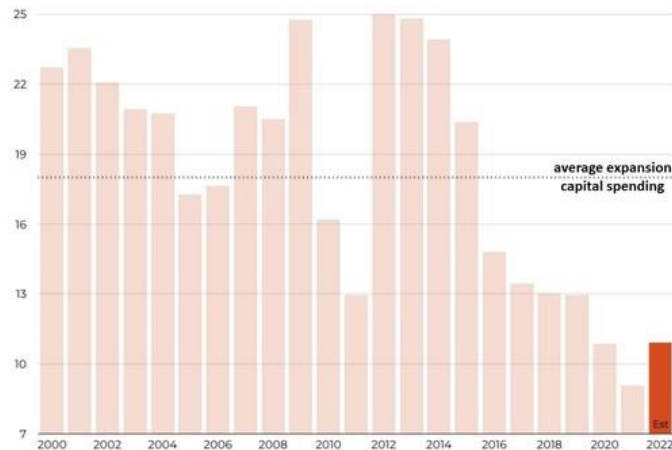
- Natural gas -

- **US natural gas consumption reached multiyear lows** in January and February. *Insert:* monthly gas consumption, in billion cubic feet per day.



- Coal and mining -

- Over the past 20 years, [expansion capital spending](#) in the mining industry has usually been about 19% of EBITDA (see graph insert below); however, even though the sector is earning record profits and demand for minerals and metals is surging, **the sector has reduced its expansion capital spending to around 10%**. In other words, the industry is distributing dividends to shareholders but not investing in green- or brownfield mining projects.



- Carbon capture -

- *Special report:* Carbon capture projects in the Midwest have been able to defeat legislative proposals to add regulations or block them, increasing the likelihood that a [network](#) of planned pipelines to transport greenhouse gas will move ahead. The pipelines will move carbon dioxide from ethanol and fertilizer plants to sequestration sites in Illinois and North Dakota.

No- / Low-Carbon and Renewable Energy



- The DoE is no longer accepting proposals to build the nation's first hydrogen "hub" and is now reviewing applications to determine who will win the \$7 billion prize in the fall. There were 79 total applications submitted and **the DoE has already identified the 23 finalists**. One of the applications was submitted by Mitsubishi Power, which proposes to build two [underground caverns](#) nearly twice the height of the Eiffel Tower to store 300 gigawatt-hours of hydrogen. (*Insert: interactive map; darker shades of blue = greater density of hydrogen stakeholders*). AES Members have access to a directory of more than [2,000 H2 subject matter experts](#) to watch.

- **Feature: There is more than 2,000 gigawatts (GW) of new power generation and energy storage waiting for permit approval.** The amount of solar, battery storage, and wind energy (~1,250 GW capacity) [equals](#) the installed capacity of the entire US power plant fleet. On the one hand, the data confirms a transition is possible; on the other hand, most of these projects won't get built because permit approval takes too long.

- **Top-6 installers of onshore wind** in 2022, by country:

1. China (32,579 MW)
2. US (8,612 MW)
3. Brazil (4,065 MW)
4. Sweden/Finland/Germany (tie) ~ 2,400 MW

- **There are hundreds of hydroelectric dams along the Colorado River and its tributaries**, all of which have a combined generating capacity of about 4,178 megawatts (MW), or enough power for about 7 million people in Western states. However, the river level is at a historic low, and the problem is [most acute](#) in the upper basin for lakes Mead and Powell, the river's two largest reservoirs. (*Note: hydropower is 53% of the total renewable energy supply in the West.*) See "Colorado" in the Policy section below. [AES Members](#) have access to AES published reports, including [Water Works](#), a white paper on hydropower.

- Related, the snowpack throughout the Western US has started to [melt](#), which marks the **beginning of an extraordinary hydropower season for the West**. Mammoth Mountain, for instance, had 723 inches of snow, well above their seasonal average of 400 inches. However, hydropower in the Desert Southwest will not be as robust.

- Energy Policy & Geopolitics -

- Beltway Buzz -

- **The US EPA proposed [new](#) federal emission standards that will apply to 67% of all passenger and light-duty trucks** by model year 2032, an increase of 50% above previous goals (emissions from heavy-duty trucks were not addressed). Until this new EPA rule, California and the European Union [had been leading](#) the world's transition to electric vehicles — although Europe recently watered down its commitments.

- **The US House of Representatives finalized all [appropriations requests](#) for FY24.** For example, there is about \$60 billion for carbon removal which will be distributed by several federal agencies. (*Note: Civics 101 reminder: the House is responsible for appropriations.*)

The US EPA is [tightening rules](#) that limit emissions of mercury and other harmful pollutants from coal-fired power plants.

- **The US Treasury Department and IRS formally established "Initial Guidance" for [bonus extra tax credits](#) for renewable energy projects in "energy communities"** (IRS Notice 2023-29). This is the first of many announcements about extra tax credits. (*Note*: developers can rely on the current Guidance until the next regulations are issued.)

- State Spotlights -

- **Maryland**: The legislature will pass and the Governor will sign the POWER Act ([SB 0781](#)), which will support addition of 8.5 gigawatts of offshore wind by 2031.

- **Wyoming**: The Biden Administration [approved](#) \$3 billion to build the 732-mile TransWest Express Transmission line, which will distribute electricity generated at the largest onshore wind farm in the US (the 3-gigawatt Chokeycherry and Sierra Madre Wind Energy project in Carbon County, Wyoming).

- **Georgia**: Ascend Elements, the largest battery recycling plant in the US, is [open](#) for business.

- **West Virginia and North Dakota**: The DoE announced \$16M to explore the possibility of building a first-of-its-kind [separation refinery](#) for rare earth elements and critical minerals.

- **Colorado**: The US DoI's Bureau of Reclamation is considering 3 new guidelines for use of water from the Colorado River (see "hydropower" in Low-/No-Carbon section above):

1. No-action;
2. Cuts in water use in the Lower Basin (based on "priority of use" rights);
3. Cut use downstream in Southern California, Arizona, and Nevada.

Note: [AES Members](#) have access to a true and correct copy of the DoI's "Environmental Impact" study and all AES reports, including [Water Works](#), a white paper on hydropower.

- Global Spotlights -

- **Africa**: Energy- and climate-tech ventures in Africa raised \$1.3 billion in Q1 2023, which was YOY 29% [lower](#) than last year. The 5 most active investors in 2021/22 in Africa are:

1. Launch Africa - 124 deals
2. Flat6Labs - 88 deals (mostly in NEMA)
3. Y Combinator - 80 deals
4. LoftyInc - 76 deals
5. Techstars - 67 deals

- **L/S America**: President Andrés Manuel López Obrador (AMLO) of Mexico authorized [funding](#) for the Olmeca refinery (340,000 b/d) in Dos Bocas, Mexico. The goal is to support Mexico's efforts to achieve "energy independence"; however, funds will be used to quickly complete construction of the facility so that it can be running in a few months; meanwhile, there is very little focus on its operations. Pemex, the state oil company that operates six refineries in the country, often sees refinery utilization rates fall below 50%. (For comparison, the long-term utilization average for US refineries is around 90%).

- **Asia**: The Shanghai Cooperation Organization is a Eurasian political, economic, international security and defense organization like NATO. It is not formally associated with China's multinational 'One Belt, One Road' program. Though its objectives are somewhat broad, in practice SCO membership is growing and appears almost entirely [focused on close collaboration](#) with countries that produce oil and gas.

- SCO founders: China and Russia
- Original members: Russia, Kazakhstan, and India (which was granted the right to appoint the next SCO president)
- Newest member: Iran
- Applying members: Kyrgyzstan, Tajikistan, Pakistan, and Uzbekistan
- Dialogue partners (aka "observer status"): [Saudi Arabia](#), Qatar, Egypt, Bahrain, the UAE, and Kuwait.

- **North America:** The Royal Bank of Canada is now the world's [top](#) financier of fossil fuel projects, with about \$42 billion invested, passing JP Morgan Chase, which had been in the top spot since 2019.

- **Europe:** The EU [avoided](#) the worst of an energy crisis this winter, in part due to:

- Larger contributions from renewable energy (about 50GW of wind and solar was installed in 2022, a record high).
- Operation of nuclear power facilities were extended, especially in Germany.
- EU electricity demand fell 3%; mild weather played a part in reduced demand.

- Climate and Sustainability -



- The US is [closer than most](#) countries to meeting its Paris Agreement goals. Recent legislation (IRA, Bipartisan Infrastructure, etc.) has set a plausible path to meeting international climate commitments; however, a handful of states and cities will have to do extra work. (Insert - US emissions, a comparison of two scenarios: **blue** = current trajectory; **orange** = aggressive action)

- **Global CO2 emissions reached 417 parts per million**, an increase of 2.13 ppm — the 11th straight year of increases above 2 ppm ("[the highest sustained rate of CO2 increases](#)" since monitoring began 65 years ago, according to NOAA). For comparison, atmospheric CO2 is 50% higher and methane concentrations are 2.5 times greater than pre-Industrial Era levels.

- **LinkedIn has published a [Sustainability Resource Hub](#)**. The resources are divided into 3 categories:

1. Strategies
2. Action Items
3. Communication

- About two-thirds of all oil and gas wells in the US that apply hydraulic fracturing methods to enhance production/output use at least one chemical that is recognized as toxic but is also exempt from federal regulations. **Toxic chemicals used for O&G frac'ing that are not regulated** include but are not limited to:

- Ethylene glycol - used in antifreeze and hydraulic brake fluid
- Acrylamide - found in some food packaging and cigarette smoke
- Naphthalene - often used as a pesticide
- Formaldehyde - a common industrial chemical used in glues and coatings
- Benzene - a potent human carcinogen; toxic if exposed to 0.001 milligrams per liter (equivalent to half a teaspoon of liquid in an Olympic-size swimming pool).

Note: [AES Members](#) have access to the national hydraulic fracturing chemical disclosure registry.

- "**The Three Sisters**" (noun) def: three [symbiotic](#) agricultural crops: squash, maize (corn), and beans (typically "climbing" beans); a technique practiced by various Indigenous peoples of North America, also referred to as "companion planting." In the case of The Three Sisters, maize and beans are planted together in mounds formed by hilling soil for growing squash; cornstalks serve as trellis for climbing beans; the beans repair nitrogen in the soil and stabilize the maize in high winds; and, the wide leaves of the squash plant shade the ground, keep the soil moist, and help prevent weeds. Output is increased when these three particular crops are grown symbiotically. Please [contact us](#) if you know of other symbiotic crop examples.

- **Sea levels across the Southeastern US are rising three times faster** than the global average. [AES Members](#) have access to the peer-reviewed research.

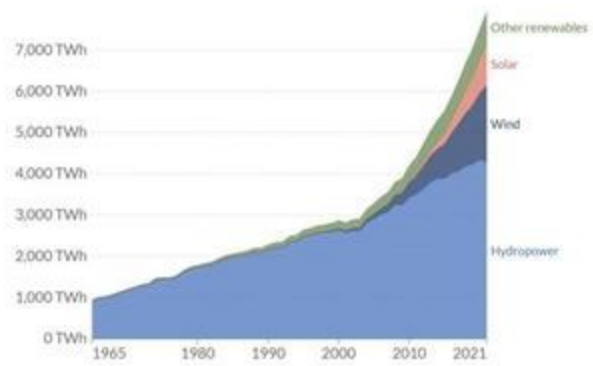
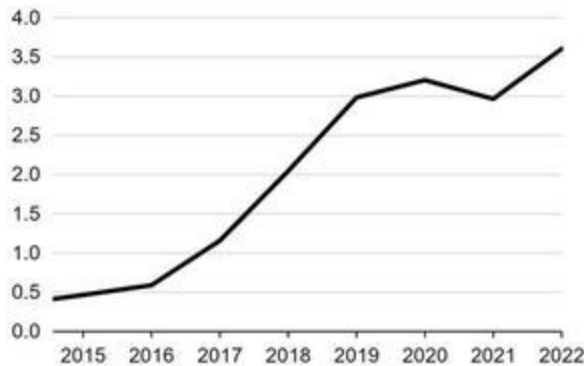
- Research and Markets -

- Stony coral tissue loss disease, or SCTLD, is a fast-acting, deadly plague-like bacteria that is killing coral along the Florida coast and throughout the Caribbean. Researchers have found a **bacterial probiotic treatment that can stop or slow SCTLD**. [AES Members](#) have access to the peer-reviewed research.

- *Attention AES Members: Start preparing for a forthcoming FOA (#2978) for [Tribal Colleges and Universities](#)*, probably coming out this summer. (Related, Navajo Tech is the [first](#) TCU to offer a PhD program.) [Contact us](#) for more information.

- **Spotlight on Section 48C:** The IRA is so expansive that it's easy to miss specific opportunities. For instance, consider [Section 48C](#), the Advanced Energy Manufacturing Tax Credit (Notice 2023-18).

- **The energy transition is less a story about change and more about generating more energy.** Consider, for instance, the two charts below: [left](#) - growth in US petroleum exports; [right](#) - global growth in renewables.



- Kazakhstan's state-owned uranium mining company **Kazatomprom is increasing production of uranium**, with the intent of taking market share from Russia's state-owned nuclear power company, Rosatom, which dominates the global nuclear supply chain and is the world's largest supplier of enriched uranium for nuclear power stations.

- Electricity & Power -



- The alternating currents (AC) used in electricity grids have many advantages, but they are not good for sending a lot of power over long distances. For instance, long-distance AC lines require booster stations to make up for losses in the transmission process. On the other hand, long-distance direct-current (DC) lines have no such losses, but DC technology is expensive, cumbersome, and unreliable. Consequently, most grids rely on AC lines.

However, **new IGBT transistors make high-voltage DC-based grids more reliable, affordable and effective.** (Insert: **planned** and **operational** high voltage DC transmission lines.) Note: IGBTs and HVDC lines are manufactured by Siemens and Hitachi Energy, respectively.

- **Top-8 metro-areas/cities that [support](#) necessary electric vehicle (EV) infrastructure:**

1. Seattle, WA
2. San Francisco, CA
3. San Jose, CA
4. Portland, OR
5. San Diego, CA
6. Sacramento, CA
7. Los Angeles, CA
8. Miami, FL

Note: Metro-area McAllen-Edinburgh-Mission, Texas, has no public EV charging stations.

- **Register for the 2023 [NEUAC annual conference](#), June 13 - 15 in San Diego.** Note that the 2024 conference will be in Chicago, Charlotte in 2025, and Seattle in 2026.

- University spotlight -

- *Featured:* The incubator/accelerator programs at **Michigan State** are looking for short-term CEOs to lead companies in their portfolio to market. Contact us if you are interested.

- *Save the date:* **West Virginia University** [Energy Conference](#), September 20-21, 2023.

- *Recommended resources:* The Natural Resources Institute at **Texas A&M University** hosts interactive [mapping](#) tools to explore land use trends, wind energy development, and water and equity trends in the state of Texas.

- The Center for Midstream Management and Science ("CMMS") at **Lamar University** will host the Process Safety and Reliability Group's "Safety, Risk and Process Plant Reliability" [training courses](#) at its on-campus facilities.

- The new School for Sustainability at **Stanford University** has announced its first focus area: [greenhouse gas removal from the atmosphere](#).

- EPIC at **UNC Charlotte** [won](#) the Clean Cities Award for developing PoleVolt, an EV battery charging station.

- The Energy Institute at **Colorado State University** has published a [study](#) on indoor air quality in developing countries.

- Quotes -

The pull, power, and promise of markets

"We are preparing our reserves for production, so we will be able to respond to market requests."

- Kazatomprom CEO Yerzhan Mukanov, on increasing demand from nuclear power stations throughout Europe for uranium processed by the company he runs

"Hydroelectric power will be so cheap in the West this year that natural gas suppliers might as well just give up this summer."

- EnergyGPS Editorial

"Invest in Our Planet"

- The theme for Earth Day 2023 (Saturday, April 22)

- Bulletin Board -

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- **SPOTLIGHT:** **Schneider Electric** is hiring [Performance Assurance Consultants](#), [Senior Account Executives](#), [Automation Engineers](#), and [Project Development Managers](#).

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.

- **Fire2Fission** is currently looking for a volunteer podcast editor who is interested in gaining experience in media creation and wants to get access to some energy industry professionals.

- **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.

- **SustainabilID** offers strategic advice, leveraging thought leadership, tailor-made tools, top talent, and an ecosystem of industry associations and knowledge platforms focused on [innovating](#) to net zero.

- Gratitude -

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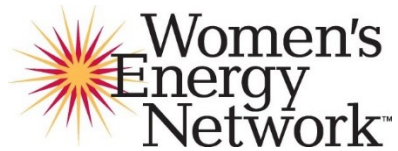




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