ENERGY MATTERS

Soundbite summaries of the energy news you need to know

AN OFFICIAL PUBLICATION OF AMERICAN ENERGY SOCIETY

November 27, 2023

The Power Read

- **Fossil**: US production increases? OPEC+ wavers.
- **Coal/Mining**: What metal is mined the most? Iron ore.
- **Carbon**: The top carbon-tech startup in 2023? *Equatic*.
- **Low-carbon**: A profitable use of utility-scale batteries? Day-trade arbitrage.

News from the Society

Don't miss our end-of-year special publications, including:

- ***Energy Writer of the Year*** (the premier literary award for energy)
- Energy Awards (including person, company, innovation, and startup of the year)
- The Lighter Side of Energy
- The Energy Year in Review (a calendar of energy history)

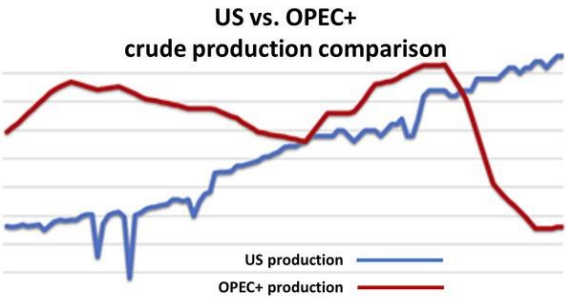
Did a Member of AES forward this issue of *Energy Matters* to you?
Sign up as a Friend of the Society for free to receive this publication.

Fossil Fuels

- Oil -

- To boost oil prices, top OPEC+ oil exporters Saudi Arabia and Russia say they will continue to cut production until year end. However, **the US continues to increase production, adding another 3.6 million barrels in a single week** (to 422M barrels), a new record (13.2 Mb/d) that far exceeds all expectations. In other words, US production is still a big problem for OPEC+. Indeed, disagreement between cartel members about future production cuts led to postponement of the next OPEC meeting. (Note: OPEC has delayed meetings before, but never for as long as this.)

See also: Energy Today, Shale 2.0

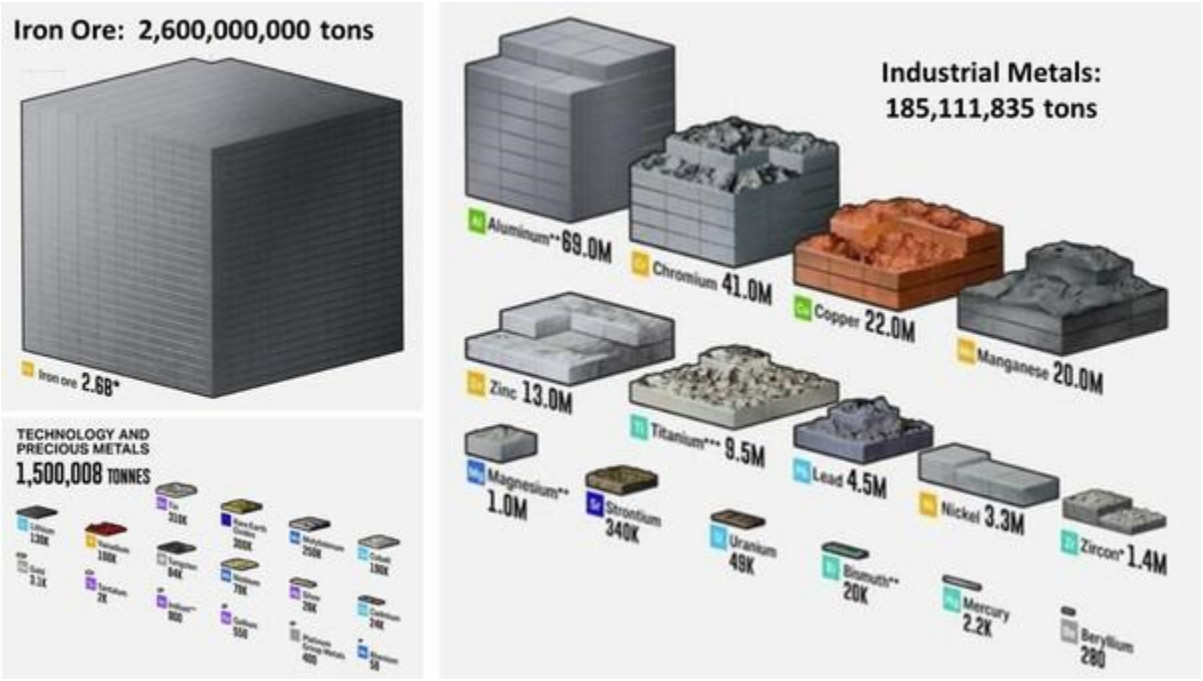


- Natural gas -

- In the last 15 years, **the operating efficiency of combined-cycle natural gas turbine electric power plants in the US has improved from 40% to 57%.** (More advanced H- and J-class natural gas turbine technologies began entering the market in the mid 2010s; also, grid operators generally dispatch generated electricity sequentially from lowest to highest cost, which means they are dispatching electricity from newer units more frequently compared with older CCGT power plants.)

- Coal and Mining -

- **Last year, 2.8 billion tons of metal were mined throughout the world.** Of that total, 93% was iron ore (emphasizing global demand for steel). Industrial metals like copper and aluminum made up 6.6% of the total. Less than 1% were critical and rare earth metals.



- Carbon/Carbon Capture -

- **Award winning carbon tech startups in 2023:**

Equatic, which launched at the UCLA Institute for Carbon Management, is the top startup in this category. Other nominees include:

C-Quester (Los Angeles)

Capro-X (Ithaca)

Capture6 (Oakland)

Carbon To Stone (Ithaca)

Dioxycle (Paris, France / Menlo Park, US)

enaDyne (Freiberg, Germany)

Global Algae Innovations (San Diego)

TerraFixing (Ottawa)

No- / Low- Carbon and Renewable Energy

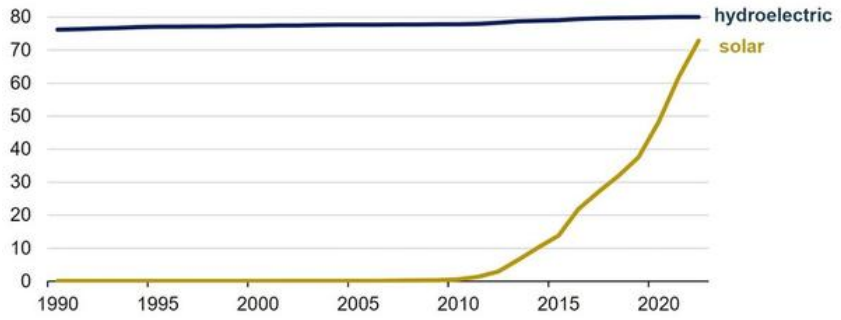
- **The most profitable way to operate a battery is to practice real-time arbitrage: charge the battery when power is cheapest and discharge when demand is highest.** On perhaps a related note, on September 24, the CAISO battery fleet set an all-time dispatch record of more than 5 GW.

- The IRS is preparing the first rewrite of investment tax credit (ITC) regulations in the last 42 years. The tax equity market is waiting for the IRS to confirm its rules before financing projects based on split tax credits. A sneak peek at some of the anticipated rulings:

- Production tax credits (PTCs) can be claimed on the electricity output from a wind, solar or other renewable energy project, while an investment tax credit (ITC) is claimed on a co-located battery;
- An ITC can be claimed on the export cable that moves electricity from an offshore wind project to shore and on the substation and transformer on land;
- No ITC can be claimed on later improvements to a project, unless the improvements are so extensive as to lead effectively to construction of a new project (the IRS uses an 80/20 test to identify when improvements are extensive enough).

- **Portugal, a nation of 10 million people, produced all of its power for six straight days on only wind, solar, and hydropower.**

- **Total solar generated electricity will surpass hydroelectric power production in the US next year.** *Insert*: total US utility-scale electric generation capacity, solar vs. hydroelectric, in gigawatts.



Policy

- Beltway Buzz -

- A number of OSW developers were starting to cancel construction contracts, like Danish developer Ørsted canceling Ocean Wind off the coast of New Jersey. **The White House responded by offering tax credits to help offset the rising costs of building offshore wind turbines as well as battery storage + small scale solar.** The IRS confirms that undersea cables that tie into the electric grid qualify for Section 48 investment tax credits under the Inflation Reduction Act.

- As per the White House, **the DoE announced that it will utilize the Defense Production Act to mobilize the production of heat pumps**. (*Note*: about 90% of US households use air conditioning, and just 15% have a heat pump.)

- Global Policy Spotlight -

- **Insights from Dan Yergin** (AES Member and AES Energy Writer of the Year, 2021): Conflict in the Middle East usually sends oil prices soaring. Not this time. After ticking up a few dollars, the price of crude is lower than the day before Hamas's attack on Israel. There are three reasons for this:

1. **The shale revolution**: the US, once the world's largest oil importer, is now its largest producer (see "oil" above);
2. **Market psychology**: Financial investors are more concerned about high interest rates and the possibility of an economic slowdown or recession than conflict in the Middle East. These macroeconomic worries constrain demand and send prices lower;
3. **A transformation in the politics of oil**: Iran and China have a stake in keeping the conflict contained; indeed, about 21 million barrels of oil pass through the Persian Gulf and Strait of Hormuz daily, most of which goes to Asian markets.

Dan Yergin offers a cautionary note: nothing guarantees that the current market calm will last. Indeed, a UN watchdog is worried about Iran's current uranium enrichment program.

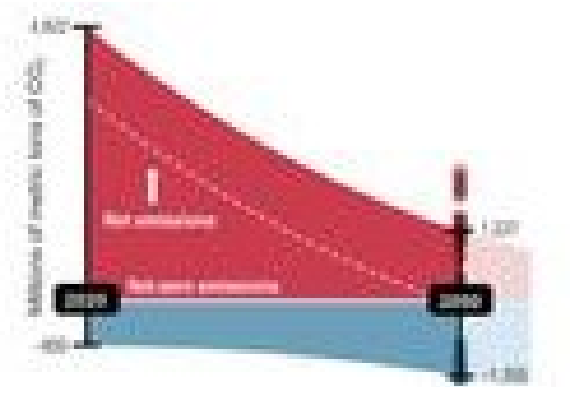
- COP28 **in Dubai (Nov. 30 - Dec. 12)**, topics in the spotlight:

1. Prioritize global methane and flaring reduction
2. Europe-MENA hydrogen connection
3. Resiliency, especially on behalf of economically developing regions

- Related, though two years later than expected, economically developed countries have finally met their pledge of $100 billion in annual funding to help lower-income nations address climate change.

- In advance of COP28, the **US and China reached a climate agreement that includes**: a pledge to triple renewable energy capacity by 2030, cut emissions, and measure all greenhouse gases and not just a select few. However, there is no mention of reducing coal (a primary source of power for China's economy) or oil and natural gas production (the US is setting domestic records).

- Climate and Sustainability -

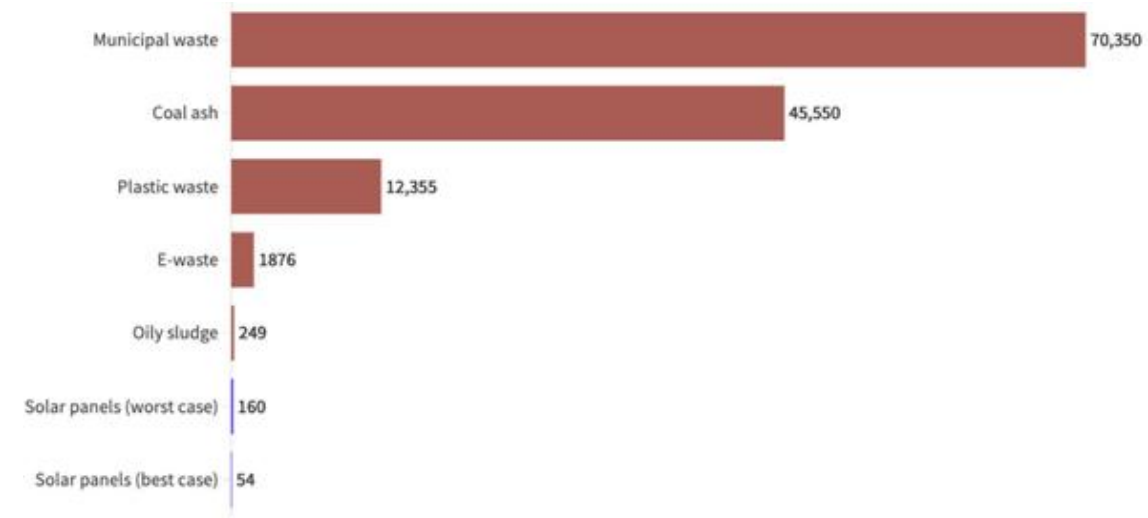


- It seems like climate scientists around the world share the same publication calendar. There were many reports in early November, but they all said basically the same thing: the world is on pace to go past the 1.5°C threshold. Of all the reports, perhaps the most comprehensive, **the Fifth National Climate Assessment (the first since 2018), offers a reminder that every fraction of a degree matters a lot**.

- **There are 20 farms in the Imperial Valley (agriculture region of California) that use 1 out of every 7 gallons of water that flows through the Colorado River**.

- **Wildfires are burning in Australia ... and Virginia.**

- **The total amount of current + anticipated solar waste (dumped panels, etc.) is on pace to be about 54 to 160 million tons**, about 99.6% less than coal ash and municipal power plant waste. *Insert below*: current and projected cumulative waste generated by 2050, in millions of tons.



- Research, Development and Markets -

- The Strait of Hormuz is the world's most important oil choke point because about **21% of all global petroleum liquids flow throw this region on a daily basis.**

- **The 8% annual increase in crude oil production in the US last year led to a 9% increase of associated natural gas production.**

- **The MotorTrend 2024 Car of the Year is ... Toyota Prius.**

- Electricity, Power, and Efficiency -

- **Zombie power plant** (noun), def: a shuttered power plant that has the potential to restart.

- The US has begun to increase construction of electricity grid infrastructure; however, electricity grid transformers, which have to be custom built, are on backlog. **The delivery time for transformers has increased from 50 weeks a year ago to 150 weeks.**

- NuScale, the first nuclear energy company to receive design approval from the Nuclear Regulatory Commission for its small modular nuclear reactor (SMR), just canceled **its first planned buildout in Utah** because the regional utility customers were concerned that NuScale electricity prices would go too high.

- **The US region that has the most all-electric commercial buildings is the Southeast**, mainly because it has the newest buildings while the Northeast has the oldest. *Table*: US all-electric commercial buildings, by percentage in census regions.

1. Southeast: 42%
2. West: 30%
3. Midwest: 25%
4. Northeast: 17%

- University Spotlight -

- The Initiative for Sustainability and Energy at **Northwestern University** (**ISEN**) is now operating as the Paula M. Trienens Institute for Sustainability and Energy.

- Researchers at **Princeton University** have found that the IRA has made blue hydrogen at least as cheap as gray hydrogen through either the 45Q tax credit for carbon capture and storage (CCS) or the 45V tax credit for low-carbon hydrogen. Green hydrogen benefits even more from the law, transforming it from being over twice as costly as gray hydrogen to produce without the law to costing one-quarter as much when claiming the 45V credit.

- The Vagelos Integrated Program in Energy Research (VIPER) at the **University of Pennsylvania** is **hiring** an Administrative Coordinator.

- **Liberty University** is building a new Center for Engineering Research & Education (CERE) **lab** in Bedford County, Virginia.

- **Binghamton University** researchers won a $1.2 million NSF award to test stability of power grids that are primarily dependent upon renewables.

- Bulletin Board -

Reach 135,000+ readers with your message.

Members of AES can post an announcement for free! **Contact us** *for more information.*

- AES recommends two virtual events hosted by **ClearPath**:
  - **NYCW event w/ API**
  - **Industrial Summit**

- **Nextcorps** received $4.5 million from the National Science Foundation to support innovation in deep tech.

- Geoff Duncan at **Ubiquitous Energy** published "A Diversified Approach to Renewable Energy in Construction"

- **Centrus** is beginning first-of-a-kind production of High-Assay Low-Enriched Uranium (HALEU) two months ahead of schedule at the American Centrifuge Plant in Piketon, Ohio.

- *SPOTLIGHT:* **Schneider Electric** is hiring Project Development Managers, Senior Account Executives, Automation Engineers II, and Performance Assurance Consultants.

- #SolarAPP+, a free online platform developed in partnership between **Sunrun** and the US DoE, helps local governments navigate the solar permitting process.

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

- Quotes -

Is there such a thing as "energy security?"

“Well, the zombies didn’t show up."
- Energy analyst Alison Silverstein, on the Texas ERCOT getting no response from recently shuttered power plants to restart during the winter

“Everybody is on edge.”
- Dan Yergin, on recent conflict in the Middle East

"It's incredibly risky."
- Vanessa Witte, senior energy storage analyst at Wood Mackenzie, on US developers building renewable energy projects even though they do not have access to critical components like transformers

“I’ve always struggled with the idea that we’re going to deal with climate change, make ourselves rich and live happily ever after.”
- Andrew Hoffman, a professor of sustainable enterprise at the University of Michigan

- Gratitude -

AES would like to recognize our sponsors — our catalysts for change.

For more information about the many benefits of sponsorship **contact AES**.

WILSON SONSINI

Honeywell

Women's Energy Network

CONSULATE GENERAL OF DENMARK Silicon Valley

orrick

NORDIC INNOVATION HOUSE SILICON VALLEY

HUNTSVILLE UTILITIES ELECTRICITY • NATURAL GAS • WATER

CLEARPATH

FIRE2FISSION

Contact Information

The American Energy Society

AES LinkedIn Group

AES introductory video

Contact the editors about the Society or this issue of *Energy Matters*.