

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

AN OFFICIAL PUBLICATION OF



AMERICAN ENERGY SOCIETY

April 4, 2022

- The Power Read -

- **Gas:** Russia demands buyers of LNG pay in rubles.
- **Low-carbon:** Next-gen solar—DSSC.
- **Policy:** With oil above \$100/barrel, Russia is still financing its war.
- **Electricity:** Top electricity exporting state: Pennsylvania.
- **Quotes:** "Russia will not engage in charity."

- News from the Society -

- AES Academic/Research Digital Librarian of the Year Award -



April 3-9: National Library Week
April 5: National Library Workers Day
April 16: National Librarian Day

Nominate a deserving candidate for the AES Academic/Research Digital Librarian of the Year.

The winner, announced at the [ALA conference](#) in June, receives an all-expenses paid self-care day of their choice (some restrictions apply).

- ***Spread the Energy, Win Prizes:*** Check out our new [AES referral program](#) with awards you don't want to miss!

- July 7–8, **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. [Contact us](#) if you are a student or early-career energy professional and would like to apply for a SISE Fellowship.

- Fossil Fuels -

- Oil -



- The global oil market is ...

• **tightening**: large-scale oil supply disruptions, sanctions that have reduced Russian oil exports, and national economies seeking alternative sources.

• **softening**: the global economy is slowing down due to supply-chain disruptions, a surge in commodity prices, and Western sanctions against Russia.

- **Consequence**: an overall decline of 1.3 million bpd for the rest of the year (or, a 950,000-bpd decline in the annual rate of oil demand growth).
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- Gas -

- The Kremlin is offering Russian natural gas at a discount but **demands** that all contracts are paid in Russian rubles. The [G-7](#) (led by European countries France, Germany, Italy, United Kingdom, as well as the United States) and [India](#) have refused to buy the gas, at least for now.

- Mining, Minerals and Coal -

- Ukraine's largest mining company has **doubled** its export sales (from 500,000 tons of iron ore per month to 1,000,000 tons) despite its war with Russia. The primary reason for growing demand is a global show of solidarity.

- Carbon Capture -

- A comparison of the **carbon footprint** of different types of coal, in pounds:

	Lignite (electricity)	Subbituminous (steam power)	Bituminous (steel)	Anthracite (domestic)
Emitted CO ₂ , per million Btu	216	212	205	227

Note: Clean coal technologies used by utilities decrease CO₂ emission levels by 10-15%.

- Low-Carbon Energy –



- There are five offshore wind projects in the US (near term):

1. Operating: a 30-megawatt wind farm off [Block Island, Rhode Island](#).
2. Operating: a 12-megawatt pilot project off the coast of [Virginia](#).
3. Planned: an 800-megawatt Vineyard Wind project off [Martha's Vineyard, Massachusetts](#).
4. Planned: a 132-megawatt South Fork Wind farm near [Long Island, New York](#).
5. Demonstration: Off the Ohio coast of [Lake Erie](#).

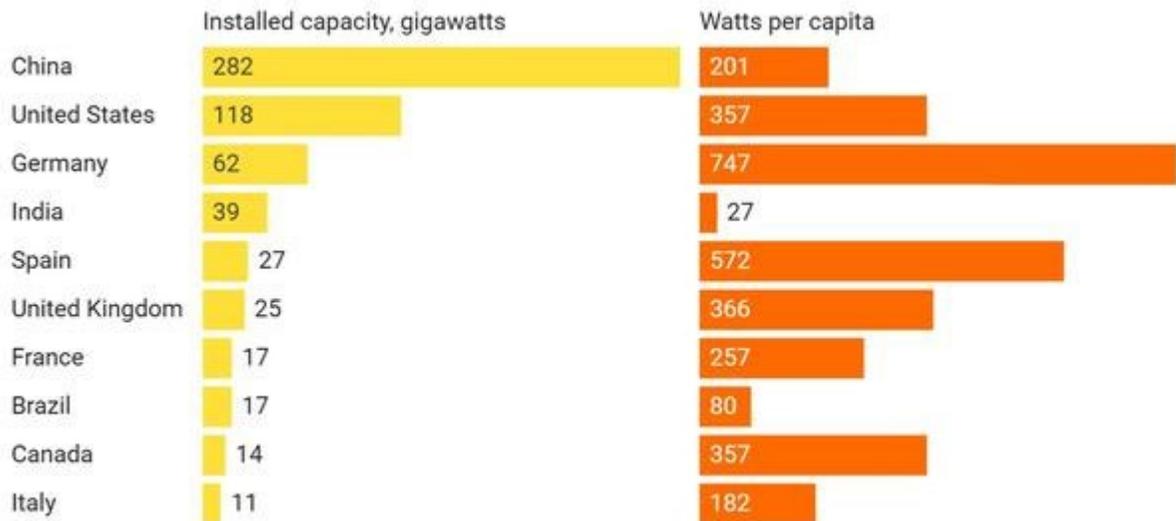
May 11, 2022: Bureau of Ocean Energy Management (BOEM, of the US Dept. of Interior) will hold an **offshore wind auction** for two leases off the coasts of North and South Carolina.

- The next-generation of solar power: a new class of dye-sensitized solar cells (**DSSCs**) can generate power by harvesting indoor and ambient light **without batteries**. (*Note:* dominant photovoltaic

technologies like polysilicon only work well in full sunlight; cheaper amorphous silicon solar cells work well in low light but are inefficient and can only power things like desktop calculators.)

- **The days following the onset of a cold or heat wave are the most important for power systems that rely on high levels of variable renewable generation.** The [calm after](#) the wave produces a lull that impacts operations more than any other weather event. *Note:* Germans have a word for the calm after a cold or heat wave: [Dunkelflaute](#).

- **Top 10 wind power countries, by installed [wind](#) power capacity:**



- Energy Policy & Geopolitics -

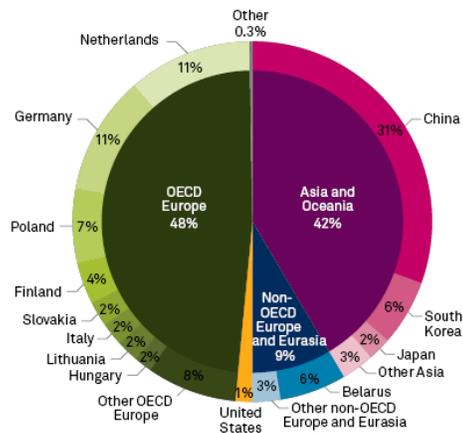
- **Fiscal break-even production price of oil/barrel, by nation:**

- Russia: [\\$79](#) / barrel (down from \$87/b in 2017).
- Saudi Arabia: [\\$67](#) / barrel (down from \$83 in 2017).
- United States: \$47 / barrel (though efficient producers break even at \$37/b).
- Venezuela: \$92 / barrel (not a typo).
- [Conclusion](#): With the price of oil above \$100/barrel, Russia continues to finance its war.

- **US President Joe Biden and European Commission President Ursula von der Leyen signed a [trade deal](#) for LNG in order to replace supply received from Russia** (note: last year, Russia supplied [75%](#) of all LNG for Europe):

- The US will increase its annual export of LNG to Europe by 15 billion cubic meters.
- The US will collaborate with other international partners to build LNG infrastructure.
- The US will share energy efficiency and clean energy solutions that can replace LNG.

Destination of Russian oil* exports
(thousand barrels per day)



Data as of March 7, 2022.
 OECD = Organisation for Economic Co-operation and Development
 * Crude oil and condensate exports by destination in 2020, the latest data available.
 Sources: S&P Global Commodity Insights; U.S. Energy Information Administration

- Sanctions applied to Russian banks in response to the invasion of Ukraine have cut off large parts of the country's economy. Although Russia's economy is just 1.75% of global GDP, its outsized **importance in the global supply of energy and metals means the sanctions will have a significant impact on the global economy.**

- The US SEC has proposed a new rule requiring **public companies to disclose certain climate related information** (the "E" in ESG). If passed, the process will resemble a 10-K filing.

- **Featured: The US Department of Commerce will investigate the circumvention of the solar tariff.** There is evidence that some Chinese solar panel manufacturers are re-routing products through four Asian countries in order to avoid hefty US tariffs on solar panels. The complaint was submitted to the Department of Commerce by a group that calls itself American Solar Manufacturers Against Chinese Circumvention; however, it appears that only one company was involved: First Solar. If the Biden Administration accepts the complaint, solar prices in the US will go up.

- The Biden administration has made it clear that "electric vehicles" are a priority; meanwhile, the US Postal Service purchased 165,000 new gasoline powered delivery trucks. However, in response to intense backlash, **the Postal Service added to its purchase a request to double its order of EV delivery trucks**, from 5,000 to 10,000.

- **California once again can set its own auto emission standards** under a waiver approved by the US EPA.

- Climate and Sustainability -

- **Methane leak rates in the New Mexico Permian Basin are several times higher** than EPA estimates and well above published results; 9% of all gas produced is leaked, and more than half of the total comes from 4% of the super-emitters. AES Members have access to the peer reviewed research.

- **About 400 million tons of plastic is produced each year**; 11% of that total is incinerated and 9% is recycled.

- **Greenhouse gas emissions will decrease by 9% this decade if every individual country meets its current global climate pledges**; however, these pledges are much lower than the universal target of nearly 50% by 2030 set by recent global climate treaties.

- All things remaining the same (per capita emission rates, deployed decarbonization technologies, natural ecological systems, population growth, etc.), there is about **9 years left of the global carbon budget**, and then the climate will begin irreversible change.



- **Kiribati**, a Pacific atoll nation, is a victim of climate change — two of its islands, **Abanuea and Tebua Tarawa**, have disappeared under rising sea levels. (Note: Kiribati contributes 0.6% of global greenhouse gas emissions.)

- Research and Markets -

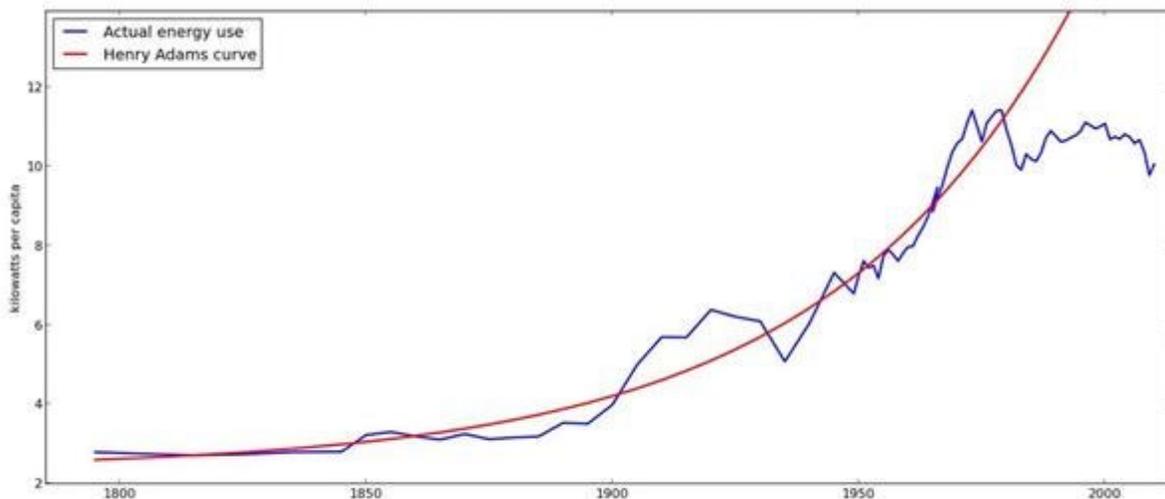
- Just before its invasion of Ukraine, Russia **was ...**

- the world's largest exporter of oil to global markets.
- the second largest crude oil exporter behind Saudi Arabia.
- the second largest exporter of refined oil products behind the United States.

- **Guyana's GDP is growing at 49% annual rate**, almost all driven by the **surging** oil markets; production is led by Exxon in the Stabroek Block.

- **Total private investment in US clean energy economy in 2021: \$105 billion USD.**

- **The Henry Adams curve:** the direct relationship between population growth, GDP, and energy consumption. *Note*, around 1970, the US fell off the Henry Adams curve, when per capita energy consumption flatlined but GDP continued to grow; the decoupling of these variables is historic. *Insert:* charting the Henry Adams curve (**red**) in comparison with actual energy use (**blue**). *Background:* Henry Adams noted this absolute relationship in his 1919 [autobiography](#).



- Electricity, Power, Efficiency, and the Grid -

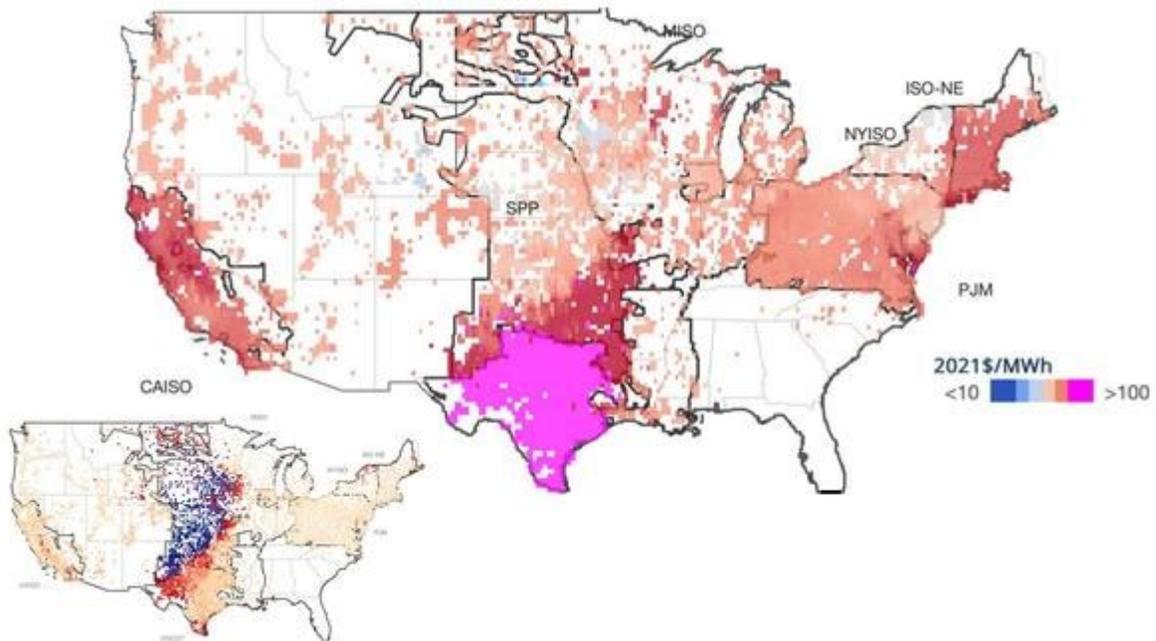
- Top-10 electricity [exporting](#) states:

1. Pennsylvania
2. Alabama
3. Illinois
4. Washington
5. North Dakota
6. Wyoming
7. Arizona
8. West Virginia
9. Oklahoma
10. Mississippi



- AES recommends: [YouTube video](#) of US grid operations under scenarios developed for NREL's Interconnections Seam Study (a 28 second loop).

- In 2021, wholesale prices for electricity were [up](#) in all regions, with ERCOT averages pushed up to well over \$100/MWh. Larger insert: average wholesale electricity prices. Smaller insert: negative pricing frequency.



- On average, about [one new customer](#) is connected to the US natural gas delivery system every minute, most converting from coal.

- Cybersecurity Spotlight -

- The US issued [criminal charges](#) against four Russian government officials from its Federal Security Service for cyberattacks on computer networks of oil and gas firms, nuclear power plants, and utility companies between [2012 and 2017](#).

- Universities in the Spotlight -

- The Institute for Energy Studies (IES) at the **University of North Dakota** offers graduate degree programs in [Energy Engineering](#), including:
 - Combined Energy Engineering Degree: B.S. and M.S./M.Eng
 - Energy Engineering: M.S. or M.Eng.
 - Energy Engineering: Ph.D.
 - **University of Hawaii** researchers are testing the "[excitation](#)" of water droplets to see if they can extract power that can be converted into electricity.
 - **Stanford University** now produces [more](#) renewable energy than it uses; the extra energy goes onto the California electric grid.
 - The **Berkeley Energy and Resources Collaborative (BERC)** will host its annual [Energy Summit](#) on Monday, April 11th at UC Berkeley's Pauley Ballroom. This is the largest student-led energy conference in the country.
 - **UT Austin's Energy Institute** has launched its Energy Futures Dashboard, an [interactive tool](#) that allows users to produce energy infrastructure models.
 - **SUNY Polytechnic Institute** has a Batteries Technology [Workforce Training Program](#).
 - **UC Davis** will host an Industrial Decarbonization Symposium on [April 25](#).
 - The Saudi Arabian Oil Co. (Aramco) has joined [Carbon Hub](#), a research initiative led by **Rice University**.
 - **Ball State University's** Immersive Learning Program hosts the "Annual Showcase Awards" on [May 2](#).
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- Quotes -

When a petro state wages war...

"The implications of a potential loss of Russian oil exports to global markets cannot be understated." – The IEA

"They're going to go up," Biden said bluntly when asked about gas prices. "Russia is responsible." – President Joe Biden

"These are all terrible tradeoffs that have to be made and terrible challenges." – Sheila Hollis, acting executive director of the United States Energy Association

"Pure economic sanctions — it's an option, but it's a very expensive option." – Yuriy Vitrenko, CEO of Ukraine's state-owned gas company Naftogaz

"That will never, ever, ever happen." – [Tweet](#) of a Taylor Swift lyric by Lisa Murkowski (Senator of Alaska), in response to Russian Member of Parliament proposing reparations from the US for "seizing Alaska."

"The Kremlin is not engaged in 'charity.'" – Kremlin Spokesman Dmitry Peskov on requiring payment for Russian natural gas in [rubles](#)

- Bulletin Board -

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- [Raizen](#): Ferrari Formula 1 will start using second-generation ethanol in their F-1 cars. (second -generation ethanol is made from non-food biomass while generating 86% less emissions than fossil fuels). *Editor's note*: some members of the AES [editorial team](#) root for F-1 driver [Sebastian Vettel](#).

- UnEarth is co-hosting a [joint webinar](#) with Bentley Systems for water utilities on building a lead service line inventory.

- Don't miss the upcoming [Deep-Tech Showcase](#), April 27 at 1:00 pm ET (online).

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

- [Clearpath](#) has published a new report on [clean hydrogen](#).

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- Gratitude -

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