

ENERGY MATTERS

Soundbite summaries of the energy news you need to know

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AMERICAN ENERGY SOCIETY

November 15, 2021

- The Power Read -

- [Policy](#): Republican victories + Infrastructure Act + COP26.
- [Oil](#): OPEC+ quotas and its impact on global energy.
- [Coal and natural gas](#): Making history — shifting global energy markets.
- [Electricity](#): Making history II — new trend in seasonal electricity prices.
- [University spotlight](#): The top-15 most sustainable universities.

- News from the Society -

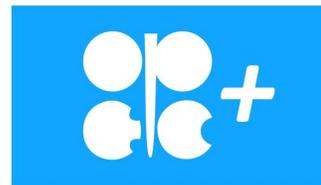
In case you missed it, American Energy Society released its most recent [Report, 500 Sustainability Thought Leaders](#), based on our dataset of the sustainability thought leaders that experts follow.

- As a Member of AES, you receive the full report.
- Organization subscribers have access to the full dataset. [Contact us](#) to learn more about all-access privileges for universities, companies, non-profits, etc.

- Fossil Fuels -

- Oil -

- OPEC+ announced that it would not change any production quotas; meanwhile, oil prices are [rising](#). For instance, Saudi Aramco increased the price of "Arab Light crude grade" that it exports to Asia by \$2.70 a barrel, the second-highest monthly increase in 20 years. *Table*: OPEC+ production quotas, by country and in 1,000s barrels/day.



<u>OPEC 10</u>		<u>non-OPEC 10</u>	
Algeria:	962	Azerbaijan	654
Angola:	1,392	Bahrain	187
Congo:	296	Brunei	93
Eq. Guinea	116	Kazakhstan	1,556
Gabon	170	Malaysia	542
Iraq	4,237	Mexico	1,753
Kuwait	2,558	Oman	804
Nigeria	1,666	Russia	10,018
Saudi Arabia	10,018	Sudan	69
<u>UAE</u>	<u>2,885</u>	<u>South Sudan</u>	<u>118</u>
OPEC 10 quota	24,300	Non-OPEC quota	15,794

OPEC+ total: 40,094 bpd

Note: for comparison, [total OPEC+ quotas two years ago](#):

OPEC: 24,708
non-OPEC: 16,356
Total quota: 41,064

- Gas -

- On November 3, the US set a record for natural gas production (94 Bcf/d) and then set a [new record](#) on Saturday, November 6 (94.4 Bcf/d).



- Special insights: Coal and Natural Gas -

- *Featured insights:* From the perspective of generating electricity, natural gas is usually more economical than coal even if the price of natural gas is slightly higher than the price of coal, primarily because coal-fired generating capacity is about 30% less efficient than natural gas. However, right now in **Asia, liquefied natural gas (LNG) is much more expensive than coal — making coal more economical. Look for [strong growth](#) of coal** paired with renewables in China and very strong growth of coal-fired power in Indonesia, Vietnam, and Thailand. ***This shift back to coal reverses long-term trends.***

- Carbon Capture -

- The US DoE used COP26 to announce the [Carbon Negative Shot](#). The program aims to **lower the price for capture and storage to less than \$100 per ton (capture/storage)**. The program is similar to the [SunShot Initiative](#) for solar, which was enormously successful.

- Low-Carbon Energy -

- **About 75%+ of the total solar energy absorbed by a solar panel is generated heat**, which increases the temperature and decreases the energy efficiency and lifetime of photovoltaic panels. [New panel cooling strategies](#) that employ an atmospheric water harvester serve as an effective cooling component.



- Over the past 50 years, [nuclear power](#) has offset about **74 Gt of carbon dioxide emissions** that would have otherwise been created through the use of fossil fuels. AES Members have access to the peer-reviewed research.

- Related, two Exelon nuclear power plants in northern Illinois (Byron and Dresden) have [reversed plans](#) to retire early as had been previously planned.



- Duke Energy is proposing to develop [offshore wind projects](#) on the North Carolina coast.

- **Top 10 Most Sustainable Data Center Operators** (in alphabetical order - thank you AES Member [Rebecca Scheel](#)):

[Ark Data Centres](#)
[AirTrunk](#)
[Scala Data Centers](#)
[Echelon Data Centres](#)
[EcoDataCenter](#)

[Iron Mountain Data Centers](#)
[Switch](#)
[Green Mountain AS](#)
[QTS Data Centers](#)
[Schneider Electric](#)

- Climate & Policy -



- *Theme: Connecting Republican Victories, the Infrastructure Act, and COP26:*

1. The **election night successes of Republican candidates** inspired a strategic shift from Speaker Nancy Pelosi, who abandoned the "pre-conference" version of the infrastructure bill and instead moved forward with an alternative "reconciliation" version.
2. That led a strong majority in **Congress to support a new \$1.2 trillion infrastructure bill**, which will provide more than \$80 billion for a variety of projects, including to:
 - Expand and modernize power grids;
 - Build nationwide electric-vehicle charging networks and bus fleets;
 - Create industrial hubs for carbon capture and clean hydrogen;
 - Support advanced batteries and nuclear power projects;
 - Fund energy-efficiency programs;
 - Invest in environmental remediation;
 - Authorize federal regulators to approve new transmission projects.
 - *Note: the fate of the Build Back Better budget reconciliation package is still unclear. AES Members have access to a [section-by-section summary](#) of the Build Back Better Act.*
3. After passing the infrastructure bill, about 20 Democrats and almost as many Republicans attended COP26 as a public statement to the world that the entire US government is serious about the climate. With greater confidence, **members of the US (and European delegations) criticized Russia and especially China** for not sending ranking representatives to the global conference including China President Xi Jinping, who did not speak via video link either.

(Context: China is the world's biggest source of greenhouse gas emissions, burns more coal than the rest of the world combined—accounting for half its electricity—and is also a leader in solar power and electric vehicles.) China's negotiators responded with their own criticisms, most directed at the US (i.e. China country never withdrew from the Paris Climate Agreement, as former US President Donald Trump had).

4. As COP26 began winding down, Beijing and the US signed a bilateral deal to cut methane and emissions in the next 10 years—the pledge has few details.
5. At the closing of COP26, delegates released a [draft of the final agreement](#) that highlights more key differences than common agreements; indeed, projected warming is 1.8C if each country keeps its promises, and 2.7C if nations stick with their policies currently in place. As projected by AES, the main disagreement was between [SDG 7 and SDG 13](#). For instance, India was able to amend the final treaty to read "phase *down*" coal instead of "phase *out*."

- *Beltway Buzz*: look for Congress to begin debating new funding opportunities to help improve energy efficiencies in heavy industry, the third largest source of greenhouse gas emissions in the US after transportation and electricity. Senator Jon Ossoff has already submitted a draft of the Industrial Energy-Efficient Technology Act, which will appropriate \$4 billion for facilities that adopt new technologies that improve energy efficiency.

- More from COP26 -

- *Highlight interest*: Former US President **Barrack Obama** speaking to youth protestors said, "Your frustrations should be channeled into productive action.... To change the minds of your fellow citizens in your respective countries, we have to do a little more listening. We can't just yell...."
- *Moderate interest*: **Bill Gates** emphasized the importance of technology, "The world already has some of the tools we'll need to do that, but we need a huge number of new inventions too."
- *Easily overlooked*: Unlike past COPs, which focused on GHG mitigation and global temperatures, delegates at this COP discussed methane, deforestation, and most of all, **climate adaptation and resiliency** – how will communities, especially the most vulnerable, respond to and survive new climate conditions?

- Far from COP26, Iran continues to ignore international sanctions as it [increases](#) natural gas production. (**Iran is the world's third-largest producer of LNG** after the US and Russia.)

- *An AES recommended resource*: A new [interactive map](#) shows **toxic air pollution by region**. Click on a hotspot or browse the map to learn more about industrial emissions or type in an address to find the estimated cancer risk at that location.

Note: Don't miss the recent report by AES: [500 Global Sustainability Thought Leaders](#)

- Research and Markets -

- "**Valuations are thru the roof,**" especially throughout the **energy sector**. For instance, EV company [Rivian](#) valuations are fluctuating between \$66 and \$105 *billion* even though it has no revenue from vehicle sales and is projected to lose \$1.28 billion in Q3 of this year. (Thank you AES expert Member, [Marco Rubin](#).)



- **Theft** from oil pipelines is booming, especially in Columbia, as criminal gangs replace dwindling supplies of smuggled Venezuelan gasoline for use in the drug trade.



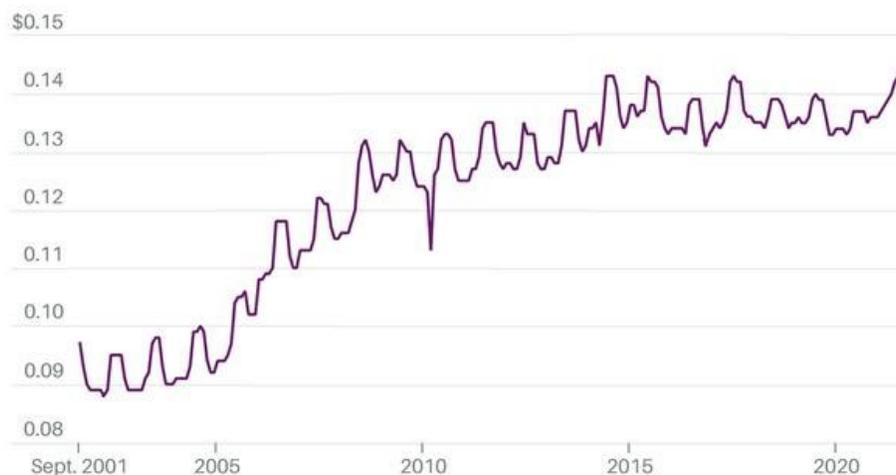
- Walmart, working with startup Gatik, has launched its "fully **driverless** closed-loop box-truck 7-mile hub-and-spoke delivery model" in Bentonville, Arkansas(?!).

- A new **cooling technology** in clothing that absorbs heat from people via thermal radiation, making them feel pleasantly cool even when surrounded by hot, humid air, has completed its research phase and is now in development.

- **WindBorne Systems**, a next generation weather startup using smart weather balloons to collect novel data to produce more accurate forecasts, **recently conducted 90 balloon pilot launches in the Arctic; results are expected in December.**

- Electricity, Power, Efficiency, and the Grid -

- *Spotlight on historic electricity prices.* **Electricity prices in the US always follow a typical pattern where prices increase in the summer and decline the following winter.** For instance, in the last twenty years, prices in summer months (May–October) average \$0.007 per kilowatt-hour *more* than in the winter months; and, prices *drop* about \$0.004 per KWH in the winter months (November–April) compared to the preceding summer months (insert below; note that electricity prices diverged from this pattern *only once* with a brief spike in the winter of 2006.) Now, **electricity prices are on a very different path.** In the winter of 2020–2021, the price of electricity actually *rose* \$0.001 per KWH compared to the previous summer ... and prices are expected to *rise again* this winter as well. If it does, last winter will not be an aberration but a dislocation.



- **Use of utility-scale batteries is [changing](#)**; frequency regulation remains the most common use for batteries, but other uses, such as ramping, arbitrage, and load following, are becoming more common. (Note: utility-scale batteries are identified as systems that have more than 1 megawatt [MW] of capacity.)

- **People in non-OECD countries consume on average [less than half](#) as much residential electricity as people in OECD countries.**

- **[US electricity customers](#) experienced on average eight hours of power interruptions last year**, the highest total since reliability data was collected in 2013. By comparison, electricity customers in [Nigeria](#) experience about 4,600 hours of outages each year and [Afghanistan](#) experiences the equivalent of 11.5 total days of outages each month.

- Cybersecurity Spotlight -

- The hottest trend in cybersecurity attacks across the energy sector are [identity breaches](#).

- University Spotlight -

- The **15 [most sustainable](#) colleges and universities in the US:**

[College of the Atlantic](#)
[Dickinson College](#)
[UC Santa Cruz](#)
[Chatham University](#)
[Bates College](#)

[Emory University](#)
[Cornell University](#)
[Colorado State University](#)
[SUNY — ESF](#)
[UC Santa Barbara](#)

[Stanford University](#)
[UC Berkeley](#)
[University of San Diego](#)
[Loyola Marymount University](#)
[UC Merced](#)

- **AES recommended resource for students: LinkedIn's [Green Skills Fund](#)**

- **University Bulletin Board -**

- The University of Illinois Urbana-Champaign is seeking a [Director](#) for the Institute for Sustainability, Energy and Environment.
- Experts from [Tufts' Fletcher School](#) share their perspectives on the UN Climate Change Conference in Glasgow.
- *Recommended peer-reviewed research:* [The growth of solar+storage in China](#).
- Emory University's **Climate Talks** [podcast series](#) is led by students who discuss long-term solutions for climate issues with subject matter experts all over the world.
- [EPIC](#) at UNC-Charlotte is one of the few universities that specializes in energy infrastructure.
- [CAER](#) at the University of Kentucky (with the Oak Ridge National Lab) is turning coal into high-value carbon fiber.
- The Nevada Regional Test Center ([NV RTC](#)) at UNLV offers a testing facility to validate existing and emerging **solar** technologies.
- University of Wisconsin-Madison's Energy Institute hosts the [Ludois Research Group](#), which focuses on enhancing **power conversion systems**.

- The School of Environmental Sustainability at Loyola University Chicago operates a [zero waste biodiesel production process](#).
- [The Green Program](#) experiential sustainable development program has added Belize and Austria to other programs in Iceland, Peru, Japan and Nepal.
- Unearth has published a report on [wildfires and utilities](#).
- ClearPath is looking for a [Policy Fellow](#) (either an upcoming graduate or undergraduate with relevant experience). The fellow will work to advance the entire suite of clean energy technologies.

Quotes

When energy and politics collide

“What is essential is for governments to turn their pledges into clear and credible policy actions and strategies today.”

— The International Energy Agency printed statement to COP26 delegates

“The climate crisis is real, energy transition is a necessity, and we must accelerate it—but it’s not a flick of a switch. If we want to solve climate change we need to do so while at the same time insulating the global economy from extreme energy shocks.”

— Amos Hochstein, the top US energy diplomat

“We have 98 months to halve global emissions.”

— Aminath Shauna, environment minister of the Maldives

“While it is still too early to know its impact, there were some significant conversations about methane and deforestation in addition to HFC phasedown.”

— Sirius XM’s Julie Mason Mornings, reporting on highlights from COP26

“No single technology is the answer on its own, because every sector requires innovation to meet this moment.”

— US President Joe Biden

- Gratitude -

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