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New York Solar Energy Society

Monthly Digest for November 2021

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NATIONAL & INTERNATIONAL

As world leaders pledge to avert a climate catastrophe, the nuclear industry sees an opportunity for a revival. More than half a dozen European countries recently announced plans to build a new generation of nuclear reactors. Some are smaller and cheaper than older designs, occupying the space of two football fields and costing a fraction of the price of standard nuclear plants. The Biden administration is also backing such technology as a tool of "mass decarbonization" for the United States.

- https://www.nytimes.com

The Department of Interior recommended higher fees for oil and gas leases, but there was no sign the government planned to take global warming into account when weighing new applications.

- https://www.nytimes.

President Joe Biden signed the $1.2 trillion infrastructure bill, which includes funding for grid projects and climate resilience. Biden also issued an executive order outlining the administration's priorities for implementing the law and setting up a task force to oversee the process.
Provisions of the law include,

- $2.5 billion revolving loan fund to establish DOE as an anchor tenant for new or upgraded transmission line.
- $6 billion cost-share program to support grid reliability research and development, and demonstration project.
- $5 billion grant program for utilities, state and tribes to bolster the grid in the face of extreme weather, wildfire, and natural disaster.
- $7.5 billion to help set up a national EV charging system and $5 billion for electric school buses
- $8 billion to set up at least four "clean" hydrogen hubs.
- $6 billion in subsidies for uneconomic nuclear power plants.
- $3.5 billion to establish four hubs for removing carbon dioxide from the air: and,
- $2.1 billion for a loan program for carbon dioxide transportation.
- https://www.utilitydive.com/

Deforestation in Brazil's Amazon rainforest reached a 15-year high after it soared 22% in one year. The Brazilian Amazon hadn't recorded a single year with more than 10,000 square kilometers (3900 square miles) of deforestation in over a decade, AP notes.
"We are seeing the Amazon rainforest being destroyed by a government which made environmental destruction its public policy," said Márcio Astrini, executive secretary of the Climate Observatory, a network of environmental nonprofit groups, to AP.

- https://www.axios.com/

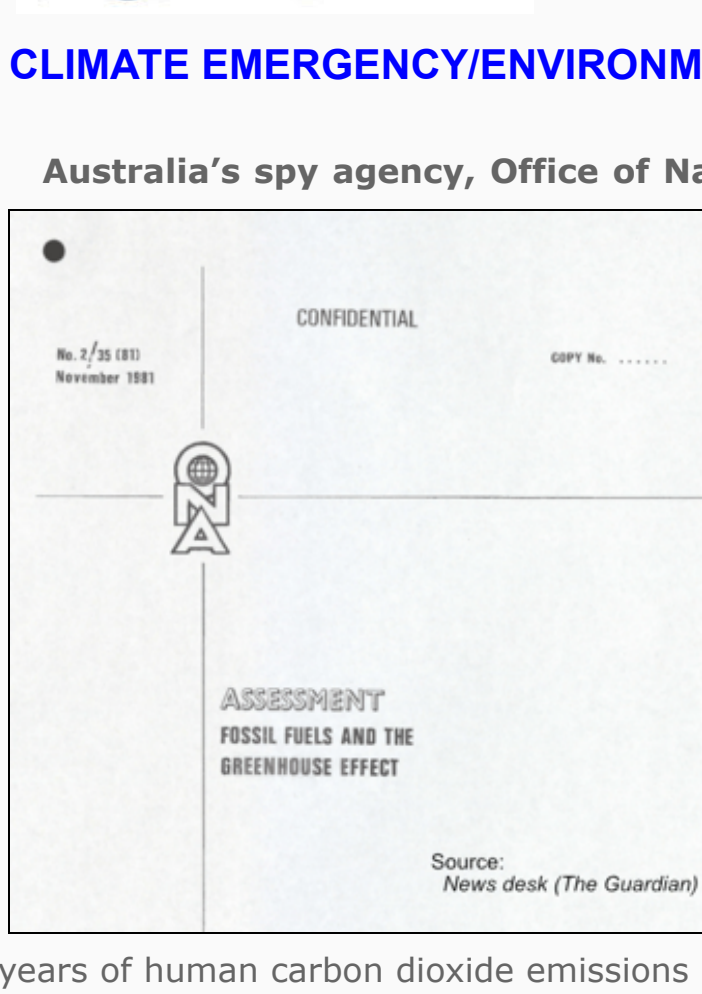
The Environmental Protection Agency intends to limit the methane coming from roughly one million existing oil and gas rigs across the United States. The intent is to restore and strengthen rules, rescinded by the previous administration, to prevent methane leaks from oil and gas wells built since 2015.

Methane, a byproduct of oil and natural gas operations, can warm the atmosphere 80 times as fast as carbon dioxide in the short term.Credit...Drew Angerer/Getty Images

- https://www.nytimes.com/

CLIMATE EMERGENCY/ENVIRONMENT

Australia's spy agency, Office of National Assessments (ONA), predicted the climate crisis 40 years ago – and fretted about coal exports. Entitled *Assessment: Fossil Fuels and the Greenhouse Effect*, the report assessed the implications of rising levels of carbon dioxide in the atmosphere "with special reference to Australia as a producer and exporter of coal". The director general of ONA wrote, "Scientists now agree that if such emissions continue it will sometime in the next century lead to a discernible 'greenhouse effect' whereby the Earth's atmosphere becomes measurably warmer with related climatic changes."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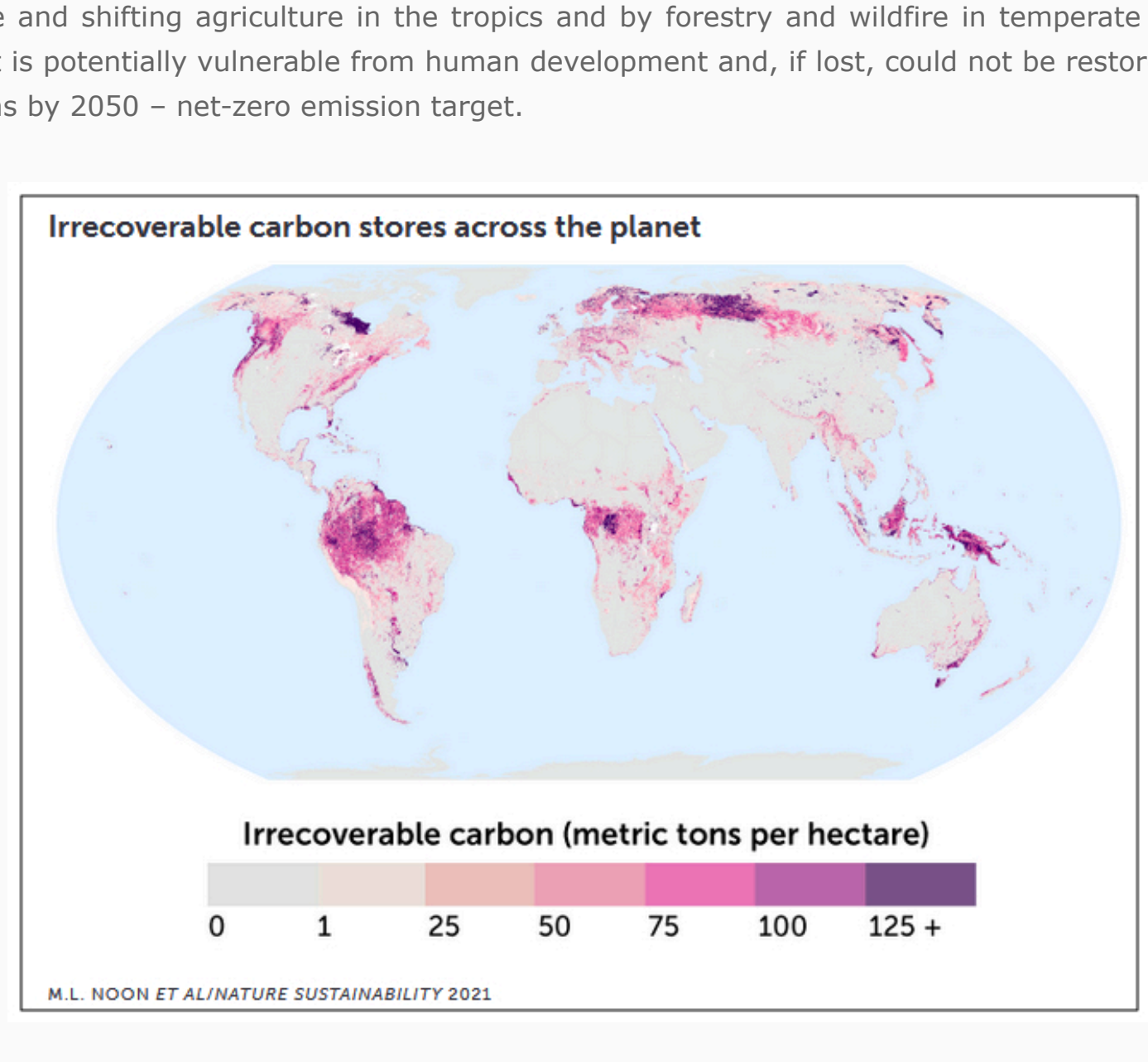
ASSESSMENT
FOSSIL FUELS AND THE GREENHOUSE EFFECT

Source: News desk (The Guardian)

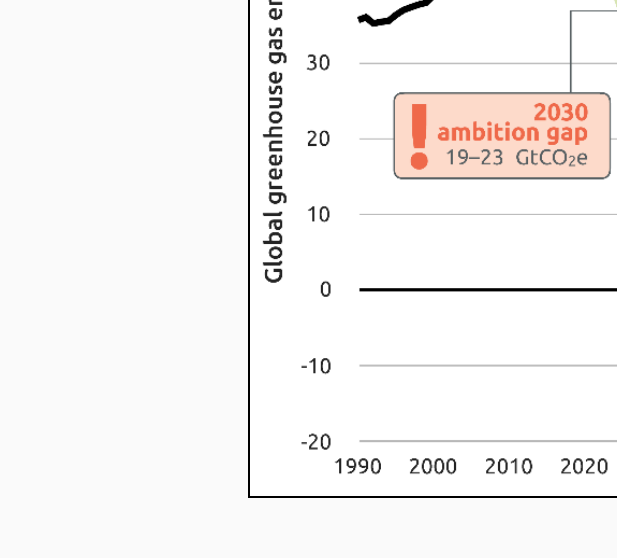
- https://www.theguardian.com

Scientists estimate the total amount of irrecoverable carbon at 139 gigatons. That's equivalent to about 15 years of human carbon dioxide emissions at current levels. 83% of irrecoverable carbon areas have tree cover
Tree cover loss is caused primarily by commodity-driven deforestation for beef, soy, palm oil and wood fibre and shifting agriculture in the tropics and by forestry and wildfire in temperate and boreal zones that is potentially vulnerable from human development and, if lost, could not be restored to those ecosystems by 2050 – net-zero emission target.


Irrecoverable carbon stores across the planet
Irrecoverable carbon (metric tons per hectare)
0
1
25
50
75
100
125 +
M.L. NOON *ET AL*/*NATURE SUSTAINABILITY* 2021

- https://www.nature.com/
- https://www.sciencenews.org/

The effect (of climate change) isn't linear— double the warming we've seen so far, which the world is on course to do now, would produce more than double an increase in the severity of extreme weather. (Daniel Swain, climate scientist at UCLA))
This COP (Conference of Parties) has again shown that climate change is being treated as a problem of the future."... Climate justice seems to have been narrowed just to intergenerational justice, but people are dying today, too." (Friederike Otto, climatologist, University of Oxford, UK)

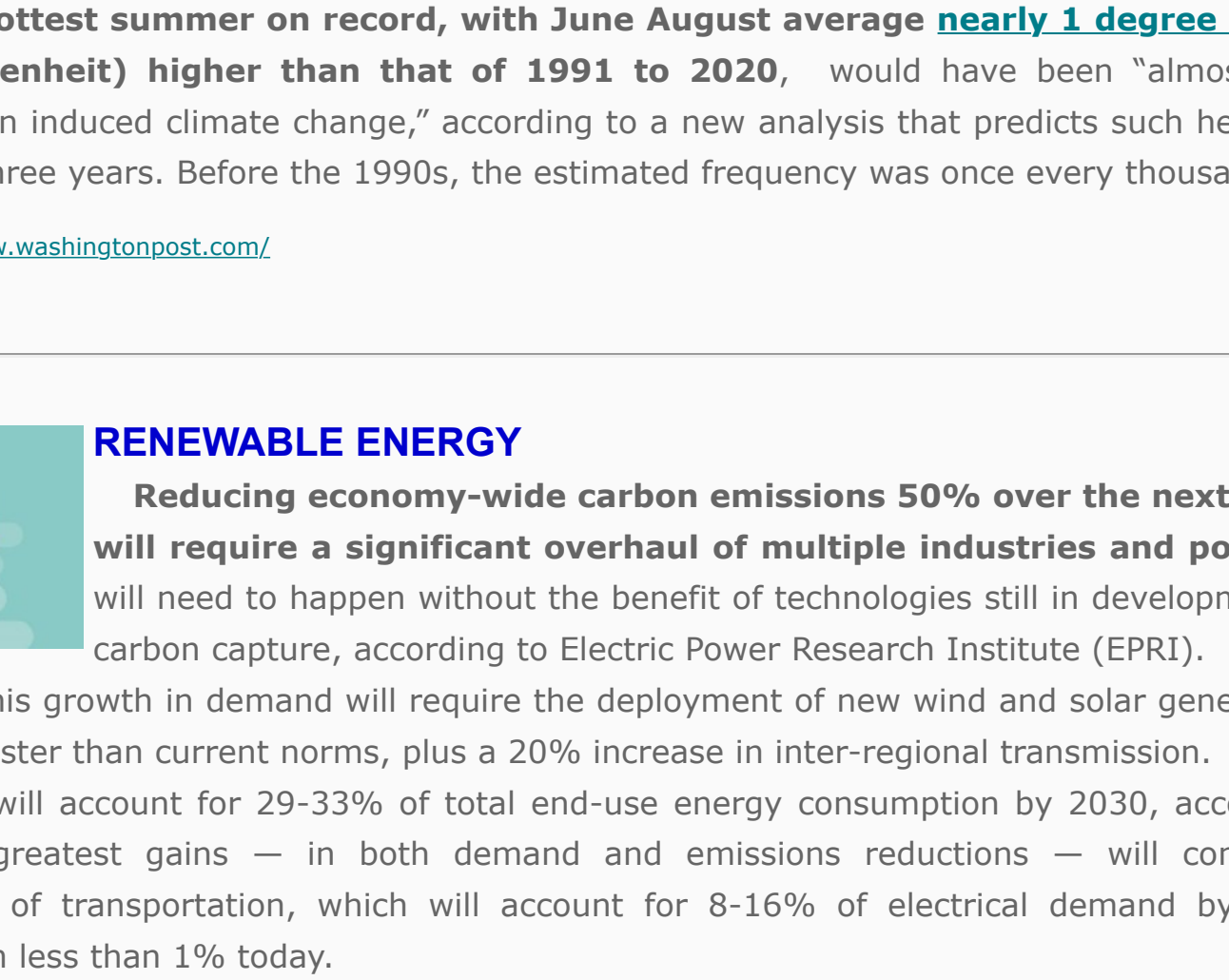


Runoff (dark brown) on 11/16/2021 pours into the waters surrounding Vancouver, Canada, and Bellingham, in Washington state, after heavy rains and mountain snowmelt led to deadly flooding. Photo: NASA Worldview

- https://www.axios.com/

The Glasgow Climate Pact is a step forward, researchers say, but efforts to decarbonize are not enough to limit global temperature rises to 2 °C.

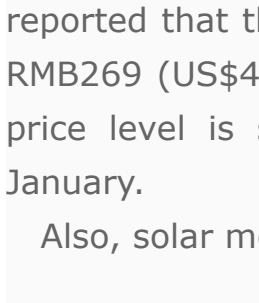
- https://www.nature.com/



- https://climateactiontracker.org/

Europe's hottest summer on record, with June August average nearly 1 degree Celsius (1.8 degree Fahrenheit) higher than that of 1991 to 2020, would have been "almost impossible without human induced climate change," according to a new analysis that predicts such heat could now occur every three years. Before the 1990s, the estimated frequency was once every thousands of years.

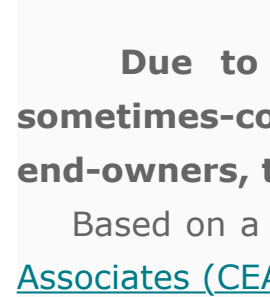
- https://www.washingtonpost.com/



RENEWABLE ENERGY

Reducing economy-wide carbon emissions 50% over the next eight years will require a significant overhaul of multiple industries and policies — and will need to happen without the benefit of technologies still in development, such as carbon capture, according to Electric Power Research Institute (EPRI).
To sustain this growth in demand will require the deployment of new wind and solar generation two to three times faster than current norms, plus a 20% increase in inter-regional transmission.
Electricity will account for 29-33% of total end-use energy consumption by 2030, according to the report. The greatest gains — in both demand and emissions reductions — will come from the electrification of transportation, which will account for 8-16% of electrical demand by the interim deadline, from less than 1% today.

- https://www.utilitydive.com/



Solar

U.S. solar thermal specialist Fafco is set to launch a new photovoltaic-thermal heat pump solution for water and pool heating. The system consists of photovoltaic-thermal panels, a 5 kWh thermal battery with a heat pump, and an electric hot water heater.

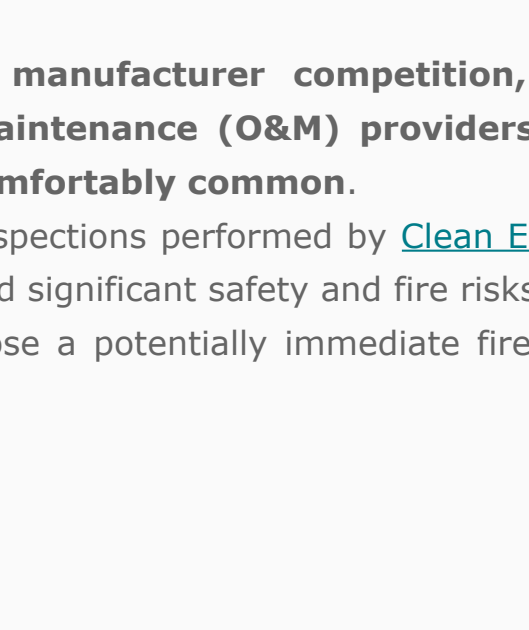


Image: Fafco

- https://www.pv-magazine.com/

Taiwanese market research company PV InfoLink has reported that the average price of polysilicon remained stable at RMB269 (US$42.1) per kg this week in China. It noted that this price level is still three times higher than that reported last January.
Also, solar module prices marked its first decline since January

- https://www.pv-magazine.com/2

It is estimated that there will be 78 million tonnes of total waste by 2050. This is roughly 4 billion panels. One major design flaw is that we tend to "glue" things together, leaving little option but to smash products into small fragments of mixed materials that are then difficult to separate. Better design for end-of-life, greater processing and recycling infrastructure is needed to extract and reuse materials and to adopt of a circular economy approach.

- https://theconversation.com/s

Due to inconsistent installation practices, intense manufacturer competition, and sometimes-conflicting motives between operations and maintenance (O&M) providers and end-owners, the risk of fires on rooftop installations is uncomfortably common.
Based on a sample of hundreds of commercial scale rooftop inspections performed by Clean Energy Associates (CEA) globally, more than 90% of inspected rooftops had significant safety and fire risks.
The three most common gating issues (that is, issues that pose a potentially immediate fire risk) include:

- Wires on sharp edges
- Poor terminations in inverters/heavy scoring on wires
- Improperly made or mismatched/cross mated connectors

Understanding risk
Site owners need to understand how they can check their current installations for fire risks and resolve them as quickly as possible. The good news is that the identification and resolution of these issues is a relatively simple one.

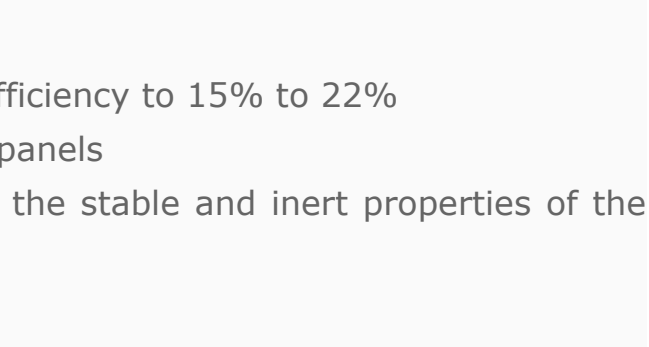
- *Step 1: De-energize site*
- *Step 2: Perform an in-depth visual inspection and system-off tests:*

The system-off test should also include DC Insulation Resistance Test (DC IRT) to check the current leakage on the AC cables, and a continuity test to ensure proper component grounding.

- *Step 3: Perform system-on inspections* after resolving the safety issues found during the visual inspection and system-off tests and eliminating the safety risks posed by those
  - https://www.pv-magazine-india.com/

Developers say industrial-scale farms are needed to meet the nation's climate goals, but locals are fighting back against what they see as an encroachment on their pastoral settings.
Approximately 0.5 percent of U.S. land would need to be covered with solar panels to achieve the decarbonization goals proposed by the Biden administration in April, according to a study by the Energy Department.

- https://www.nytimes.com/



At first glance, putting solar cells on a fence would seem to be a bad idea, as the panels would be facing the wrong way at least half the day. To get around this issue, et-sun uses bifacial solar cells. This means that whether the sun strikes the front or the back of the panel, it generates electricity. Further, they use parallel connections so that they aren't as affected by partial shading. Finally, the vertical orientation means less dust, snow, and other things that could block light can accumulate on the surface. the sun strikes the front or the back of the panel, it generates electricity. Further, they use parallel connections so that they aren't as affected by partial shading. Finally, the vertical orientation means less dust, snow, and other things that could block light can accumulate on the surface.

- **https://cleantechnica.com/**

There are three types of solar panels that are most often used in commercial or residential installations: monocrystalline, polycrystalline, and thin-film

Monocrystalline Best for Efficiency
+PLUS

- Made out of silicon with a high purity rating, boosting their efficiency to 15% to 22%
- Don't require as much space as polycrystalline and thin-film panels
- Monocrystalline panels can last upwards of 25 years due to the stable and inert properties of the silicon

-MINUS

- Price point is high because of their complex construction
- Not a good choice for cold-weather climates, as snowfall can damage the solar cells and cause the system to fail.

Polycrystalline: Best for Cost
+PLUS

- Process to create them is simpler, so they are less expensive than monocrystalline
- Less waste after the melting process, making them better for the environment
- Durable and long-lasting just like monocrystalline solar panels, so they are a good choice for budget-minded homeowners

-MINUS

- Lower efficiency (13% to 17%) because the silicon used to make them is lower in purity.
- Take up more space to produce the same level of power as that of monocrystalline cells.

Thin-Film: Best for Powering Transportation
+PLUS

- Easier and less expensive to produce
- Excellent for solar transportation applications, such as panels that are installed on bus rooftops and refrigeration for cold-storage trucks

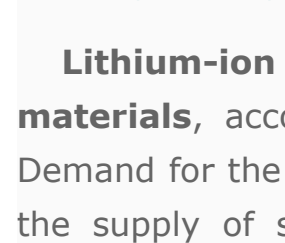
-MINUS

- Not a good choice for rooftops, as they require a large space to harness enough solar power for energy output
- Weaker so they break down more quickly than crystalline panels. Only short warranties are available for thin-film panel installations, which is something homeowners especially should consider depending on how long they plan to stay in their homes.
- https://www.forbes.com/

Community Solar

U.S. Department of Energy's (DOE) announced a new National Community Solar Partnership target that would enable community solar to power the equivalent of five million households by 2025 and create $1 billion in energy bill savings. However, community solar programs, which provide guaranteed savings to all residents, would need to surge by more than 700% over the next four years to hit these goals. Community solar doesn't currently have the supporting structure to pull off those scaling efforts, but state-level governments can help with that more than the federal government.

- https://www.utilitydive.com/



Energy Storage

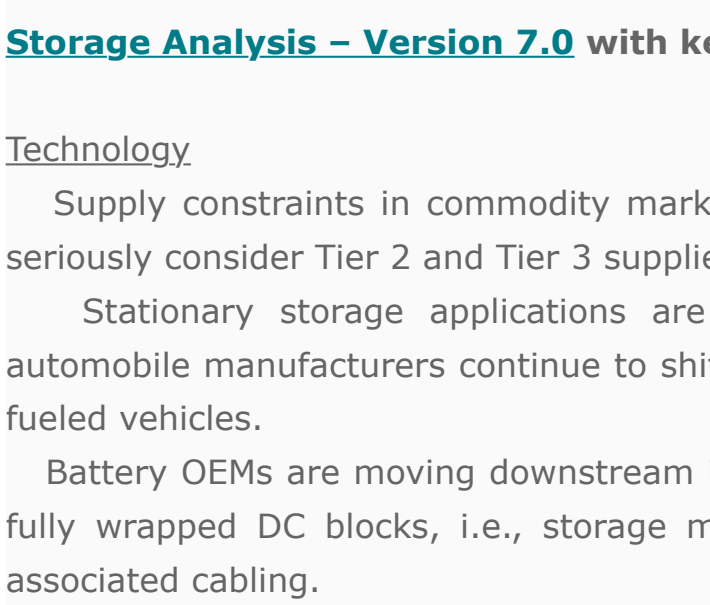
Public-funded research, primarily in chemistry and materials science, has made the largest contribution to cost reduction of lithium-ion batteries since their commercialization 30 years ago. Scientists at the Massachusetts Institute of Technology (MIT) calculated that lithium-ion battery costs have fallen by 97% since 1991.

- https://www.pv-magazine.com/

Lithium-ion batteries with recycled cathodes can outperform batteries made from pristine materials, according to a study by scientists at Worcester Polytechnic Institute in Massachusetts. Demand for the batteries — which power devices from smartphones to electric vehicles — may outstrip the supply of some key ingredients. Ramping up recycling could help avert shortages. But some manufacturers worry that impurities in recycled materials may cause performance to falter.

- Science News, December 4, 2021

By the end of 2020, 17.6 GWh of lithium-ion batteries met their end of life; by 2035, that number may grow to over 140 GWh, according to Lux research. Current recycling capabilities lag what is needed to meet this rapid growth in demand.



More than 1 million tons of batteries are expected to reach end-of-life and need to be recycled by 2030, Lux said. Currently, the supply of waste batteries is only about 2-3% of cumulative energy storage demand, presenting an opportunity for more value creation from end-of-life batteries.

- https://pv-magazine-usa.com

Lazard issued its 2021 Levelized Cost of Storage Analysis – Version 7.0 with key findings that include,

Technology
Supply constraints in commodity markets and manufacturing activities have led end-users to more seriously consider Tier 2 and Tier 3 suppliers.
Stationary storage applications are increasingly competing with EVs over module supply as automobile manufacturers continue to shift product offerings away from traditional gasoline-and diesel-fueled vehicles.
Battery OEMs are moving downstream in to capture more margin and expand market share, offering fully wrapped DC blocks, i.e., storage modules, container, supporting controls, fire suppression and associated cabling.
Concurrently, some developers are expanding in-house engineering, procurement and construction activities.
Legacy integrators are moving into energy management software, with many acquiring distributed energy resource management platforms.
Market preference has shifted significantly towards Lithium Iron Phosphate ("LFP") vs. Nickel Manganese Cobalt ("NMC") chemistries
Industry participants increasingly prefer LFPchemistries given perceived fire safety, cost, and operational advantages (e.g., depth of discharge). The cost advantage of LFPchemistries tends to be more pronounced in shorter-duration applications.
Interest in longer-duration technologies continues to grow in tandem with expectations of ever greater penetration of renewable energy generation.

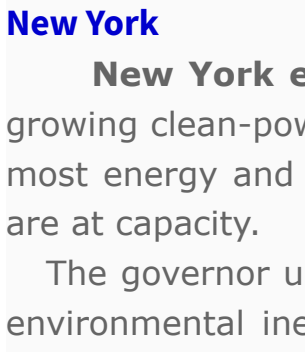
Use
Hybrid applications are becoming more valuable and, by extension, widespread as grid operators begin adopting Estimated Load Carry Capability ("ELCC") methodologies to value resources.
Developers are increasingly targeting markets in the Western U.S. (California), Western Europe and South America for long duration storage projects as these areas experience ever greater penetration of intermittent renewable energy generation in tandem with declining dispatchable conventional generation capacity.

- https://www.lazard.com/

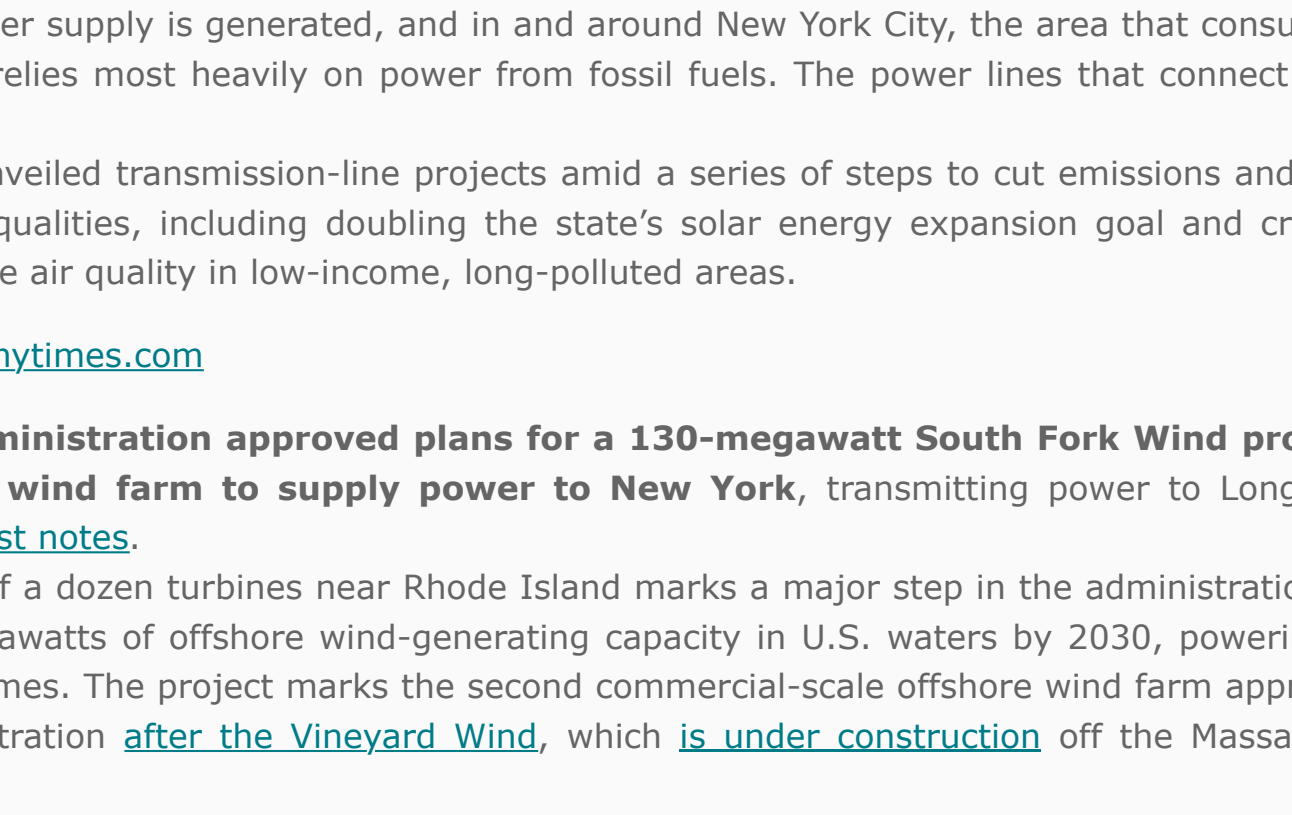
Green Hydrogen

The New York State Department of Environmental Conservation (DEC) denied a permit to NRG Energy's Astoria Gas Turbine Power Plant that would eventually be converted to run on hydrogen.
In its *Supplemental Draft Environmental Impact Statement*, the company admitted that plan to utilize "emissions-free" hydrogen fuel "is not currently technically feasible given that there are no commercially available sources of [the] fuel."
The United Nations, lawmakers, academics, and tech firms have identified major issues with hydrogen,

- The only "clean," carbon-free hydrogen is green hydrogen, and there's not enough to go around
- Green hydrogen is energy- and water-intensive to produce
- Combusting green hydrogen in power plants jeopardizes public health and delays climate action
- Building out hydrogen infrastructure – or upgrading existing infrastructure – is expensive
- https://www.cleanegroup.org/



Fossil Fuels



Data: BP; Chart: Danielle Alberti/Axios

NORTH-EAST

A 76.5 MW Farmington solar project in Maine has entered service and will supply power to five New England colleges as part of a 20-year power purchase agreement. The colleges are Amherst, Bowdoin, Hampshire, Smith, and Williams.

- https://pv-magazine-usa.com/

New York

New York effectively has two separate electrical grids: upstate, where most of the state's growing clean-power supply is generated, and in and around New York City, the area that consumes the most energy and relies most heavily on power from fossil fuels. The power lines that connect the two are at capacity.
The governor unveiled transmission-line projects amid a series of steps to cut emissions and redress environmental inequalities, including doubling the state's solar energy expansion goal and creating a program to improve air quality in low-income, long-polluted areas.

- https://www.nytimes.com

The Biden administration approved plans for a 130-megawatt South Fork Wind project. It will be the first wind farm to supply power to New York, transmitting power to Long Island, the Washington Post notes.
The installation of a dozen turbines near Rhode Island marks a major step in the administration's goal of reaching 30 gigawatts of offshore wind-generating capacity in U.S. waters by 2030, powering more than 10 million homes. The project marks the second commercial-scale offshore wind farm approved by the Biden administration after the Vineyard Wind, which is under construction off the Massachusetts coast.

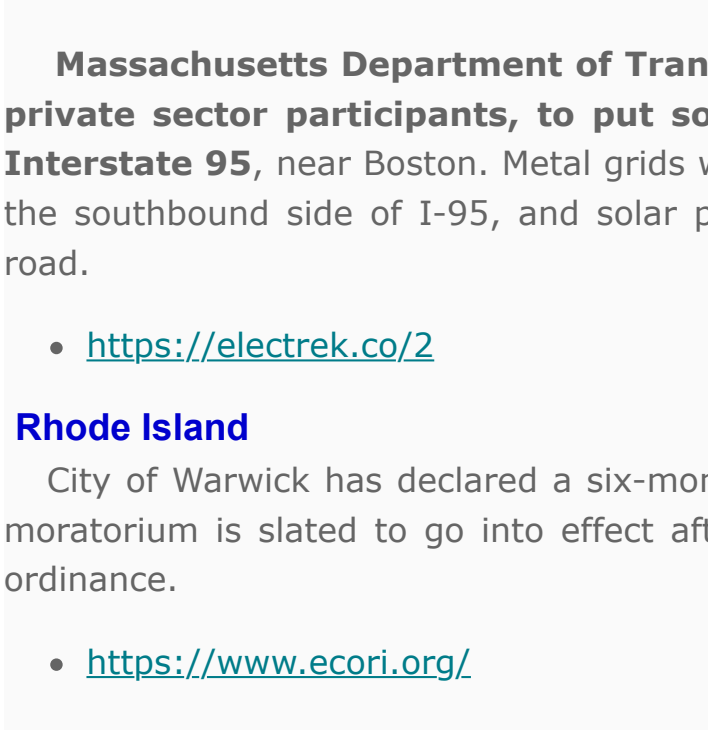
- https://www.axios.com/

The New York State Department of Environmental Conservation (DEC) denied a Title V Air Permit to NRG Energy's Astoria Gas Turbine Power Plant. Citing the project's non-compliance with New York's Climate Leadership and Community Protection Act (CLCPA). DEC referred to the project's own admission in its Supplemental Draft Environmental Impact Statement that its plan to eventually convert the plant to run on "emissions-free" hydrogen fuel "is not currently technically feasible given that there are no commercially available sources of [the] fuel." (More above in Green Hydrogen.)

- https://www.cleanegroup.org/the-hydrogen-hype-bubble-may-have-finally-popped/

Maine

The state's capacity for generating low-polluting electricity from the sun has surged in the last two years by more than 300% — and that's expected to grow as the state moves closer to its clean energy goals.



Of the 256 Megawatts of capacity added in 2019-2021, 32 Megawatts are attributable to the state's new "Community Solar" Net Energy Billing programs. The rest is mostly commercial-scale projects, with about 41 megawatts from traditional residential rooftop solar projects." Source; *Governor's Energy Office*

- https://www.mainepublic.org/en

Massachusetts

The solar industry is warning that a long-delayed expansion of Massachusetts' small-scale solar incentives could thwart the state's climate goals, underscoring the regulatory bottlenecks that can block renewable energy around the country.

- https://www.eenews.net/a

Massachusetts is pulling out of a multi-state compact to reduce carbon emissions from the transportation sector. Gov. .Baker had long touted the Transportation Climate Initiative (TCI) as the way to meet emission reduction targets in the transportation sector. But with support in other states crumbling or simply failing to materialize, his office announced that it no longer views TCI as critical.

- https://www.wbur.org/news/

Massachusetts Department of Transportation is developing a pilot project, jointly with the private sector participants, to put solar panels on a half-mile stretch of sound barriers on Interstate 95, near Boston. Metal grids will be attached to the sides of 160 concrete sound barriers on the southbound side of I-95, and solar panels will be mounted at an angle. The panels will face the road.

- https://electrek.co/2

Rhode Island

City of Warwick has declared a six-month freeze on all new ground-mounted solar installations. The moratorium is slated to go into effect after the city fulfills its public notice requirements for the new ordinance.

- https://www.ecori.org/

Vermont

Norwich Solar, as part of its Community Impact Group, announced the start of construction of a Community Solar project in Clarendon, VT, with Brattleboro Housing Partnerships as the dedicated net metering customer. The project will provide solar net metering credits to Brattleboro Housing's facilities with substantial savings over the 25-year net metering agreement.

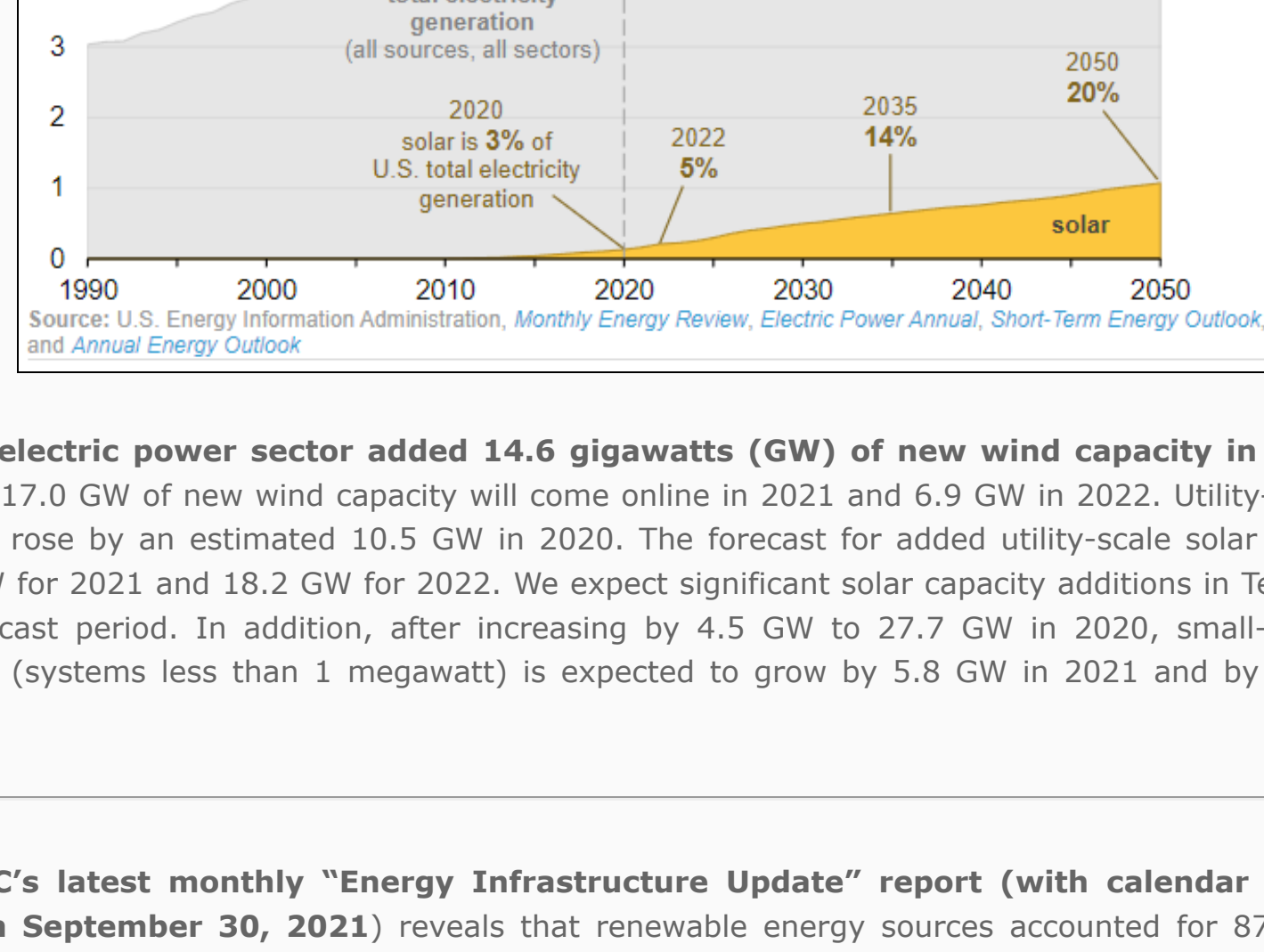
- https://vtdigger.org/press

DATA

From the US Energy Information Agency (EIA) Forecasts:

Over the past decade, major utilities in the United States have been spending more on delivering electricity to customers and less on producing that electricity.
After adjusting for inflation, major utilities spent 2.6 cents per kilowatt-hour (kWh) on electricity delivery in 2010, using 2020 dollars. In comparison, spending on delivery was 65% higher in 2020 at 4.3 cents/kWh. Conversely, utility spending on power production decreased from 6.8 cents/kWh in 2010 (using 2020 dollars) to 4.6 cents/kWh in 2020.

Solar generation was 3% of U.S. electricity in 2020, but we project it will be 20% by 2050



Source: U.S. Energy Information Administration, *Monthly Energy Review, Electric Power Annual, Short-Term Energy Outlook,* and *Annual Energy Outlook.*

U.S. electric power sector added 14.6 gigawatts (GW) of new wind capacity in 2020. EIA expects 17.0 GW of new wind capacity will come online in 2021 and 6.9 GW in 2022. Utility-scale solar capacity rose by an estimated 10.5 GW in 2020. The forecast for added utility-scale solar capacity is 15.7 GW for 2021 and 18.2 GW for 2022. We expect significant solar capacity additions in Texas during the forecast period. In addition, after increasing by 4.5 GW to 27.7 GW in 2020, small-scale solar capacity (systems less than 1 megawatt) is expected to grow by 5.8 GW in 2021 and by 7.8 GW in 2022.

FERC's latest monthly "Energy Infrastructure Update" report (with calendar year data through September 30, 2021) reveals that renewable energy sources accounted for 87.61% – or 16,665 megawatts (MW) – of the 19,022 MW of new capacity. Solar led the capacity additions with 8,410 MW, followed closely by wind (8,188 MW). Compared to the first nine months of 2020, new solar capacity additions are 38.28% higher while those from wind are 34.19% higher. There were also small additions in 2021 by hydropower (28 MW), geothermal (25 MW), and biomass (14 MW).
Most of the balance was provided by natural gas (2,327 MW) coupled with very small contributions from oil (19 MW) and coal (11 MW).
Renewables now provide more than a quarter (25.39%) of total U.S. available installed generating capacity – a share significantly greater than that of coal (18.88%) and more than three times that of nuclear power (8.32%).
That growth is almost entirely attributable to a nearly three-fold increase in wind's share of installed generating capacity and a 37-fold increase in the share of solar. Wind is now more than a tenth (10.52%) of the nation's generating capacity (up from 3.79% in September 2011) while utility-scale solar has surpassed five percent (5.14%) – up from 0.14% in September 2011 ... and that does not include distributed (e.g., rooftop) solar.

- https://www.powereng.com/

***U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2021* from the National Renewable Energy Laboratory (NREL) shows that in the first quarter of 2021,**

- Costs decline for residential, commercial rooftop, and utility-scale PV systems — by 3%, 11%, and 12%, respectively, compared to last year.
- Decline of 12.6% in utility storage, 9.68% in residential stand alone, 10.65% in commercial standalone and 13.14 % in utility stand alone
- https://cleantechnica.com/

OF INTEREST

The recent dramatic decline in battery prices has created a new possibility for electrification of freight trains. Researchers from the U.S. Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab), collaborating with UCLA and UC Berkeley researchers, make the case that the U.S. can retrofit diesel-electric trains with batteries in a way that is cost-competitive with diesel. Doing so would avoid unnecessary deaths and health impacts and save the U.S. freight rail sector $94 billion over 20 years from reduced air pollution and carbon dioxide emissions. Their study was recently published in the journal *Nature Energy*.
Their analysis shows that existing battery technology could power a freight train for 150 miles (the average daily distance traveled). A battery-powered train would use half the energy required by

average daily distance traveled). A battery-powered freight train would use half the energy required by a diesel-electric train. Their analysis shows that existing battery technology could power a freight train for 150 miles (the average daily distance traveled). A battery-powered freight train would use half the energy required by a diesel-electric train.

- https://phys.org/news/

A 'macrogrid' that increases the electricity moving between America's Eastern and Western interconnections, two of the biggest power grids on the planet, would more than pay for itself, according to new research.

Two of the biggest power grids on the planet are connected by seven small threads. They join America's Eastern and Western interconnections and have 1,320 megawatts of electric-power handling capacity.

Two papers by University of Iowa researchers published this summer and fall by IEEE, the Institute of Electrical and Electronics Engineers." Show benefit-to-cost ratios that reach as high as 2.5, indicating significant value to increasing the transmission capacity between the interconnections under the cases considered, realized through sharing generation resources and flexibility across regions."

- https://www.sciencedaily.com/

One billion people could access safe drinking water using devices that use solar energy to condense water from the air according to Team X, The Moonshot Factory.

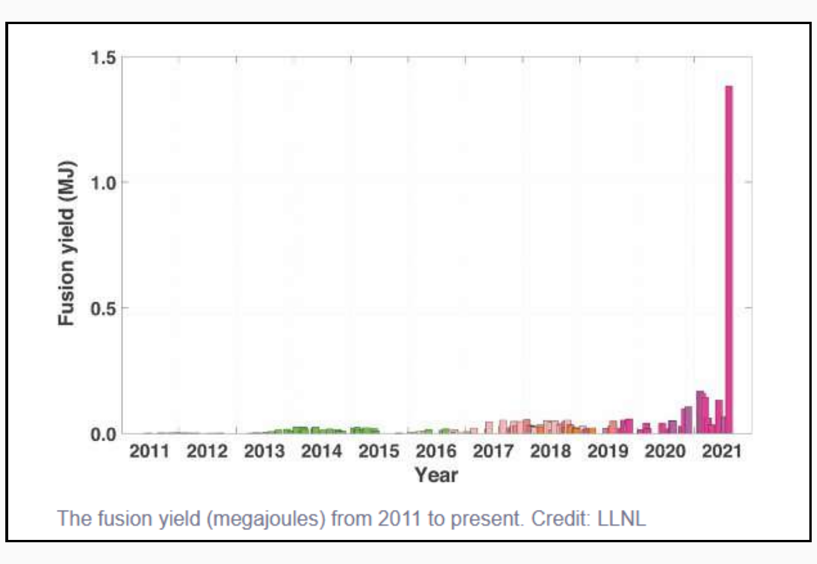
Water harvesting could be achieved in some regions using atmospheric water harvesters (AWHs), which draw clean liquid water out of humid air.

The team has created a geospatial tool called "AWH-Geo" for assessing the potential for atmospheric water harvesting in different world regions. AWH-Geo considered a location's sunlight irradiance, its relative humidity, and its average air temperature. In addition, the tool accounted for annual variations in these parameters.

Based on the use of a hypothetical continuous-mode atmospheric water harvester (SC-AWH), with a harvesting area of 1m^2 ((10.7 sf) the team calculated that such a device could yield between 0.2–2.5 l of water per kilowatt hour of primary solar energy when operating at a relative humidity range of 30% to 90% and average air temperature of 20 °C.

- https://physicsworld.com/

Nuclear Fusion



The fusion yield (megajoules) from 2011 to present. Credit: LLNL

A record yield of more than 1.3 megajoules (MJ) from fusion reactions was achieved in the laboratory for the first time during an experiment at Lawrence Livermore National Laboratory's (LLNL) National Ignition Facility (NIF). The NIF procedure involves precise guiding, amplifying, reflecting, and focusing 192 powerful laser beams into a target about the size of a pencil eraser in a few billionths of a second. Temperatures in the target of more than 180 million F and pressures of more than 100 billion Earth atmospheres are generated. Those extreme conditions cause hydrogen atoms in the target to fuse and release energy in a controlled thermonuclear reaction. This experiment produced fusion yield of roughly two-thirds of the laser energy that was delivered, tantalizingly close to the goal of fusion yield being greater than laser energy delivered.

- https://phys.org/news/

Notes:

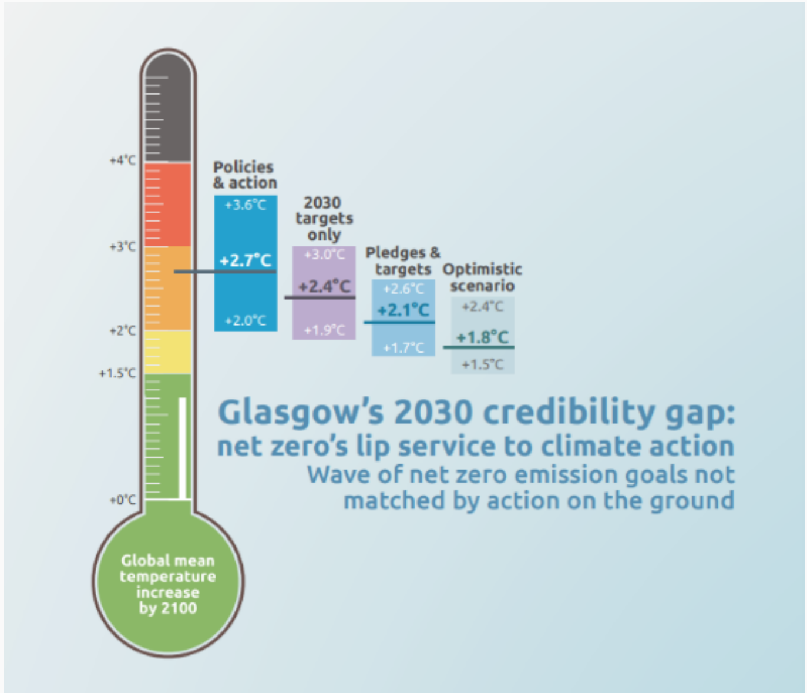
1 ***joule*** *= unit of work or energy in the International System of Units (SI); it is equal to the work done by a force of one newton acting through one meter. In electrical terms, the joule equals one watt-second—i.e., the energy released in one second by a current of one ampere through a resistance of one ohm.*

The Reads

BBC TRENDING
THE DENIAL FILES

Covid denial to climate denial: How conspiracists are shifting focus. It's part of a larger pattern. Anti-lockdown and anti-vaccine Telegram groups, which once focused exclusively on the pandemic, are now injecting the climate change debate with the same conspiratorial narratives they use to explain the pandemic.

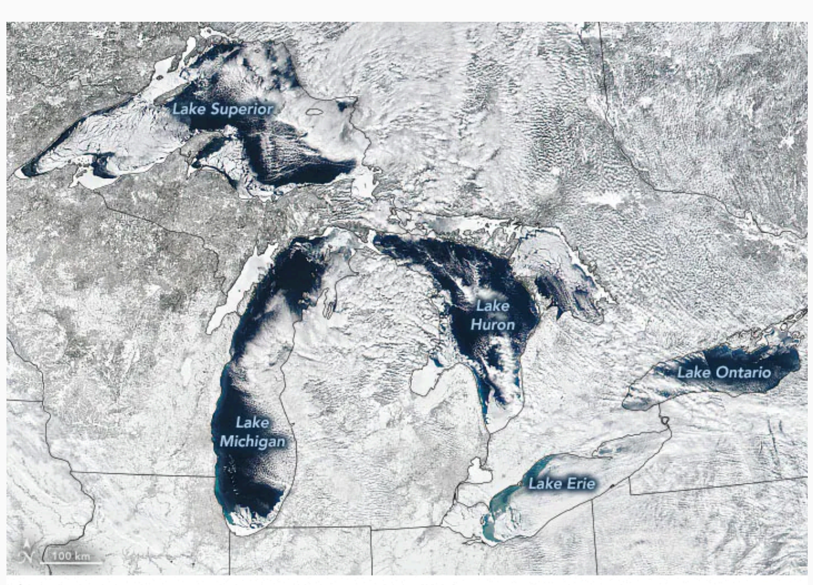
- https://www.bbc.com/



Targets for 2030 remain totally inadequate: the current 2030 targets1 (without long-term pledges) put us on track for a 2.4°C temperature increase by the end of the century. Since the April 2021 Biden Leaders' Summit, our standard "pledges and targets" scenario temperature estimate of all NDCs and submitted or binding long-term targets has dropped by 0.3°C to 2.1°C, but this improvement is due primarily to the inclusion of the US and China's net zero targets, now that both countries have submitted their long-term strategies to the UNFCC

- https://climateactiontracker.org/d

Earth's lakes are warming at a feverish pace, with the Great Lakes leading the way.



Great Lakes ice cover as seen by satellite Feb. 20, 2021. *(Joshua Stevens/NASA Earth Observatory)*

The Great Lakes, which supply water for more than 30 million people, were among the fastest-warming lakes in the study. Lake Superior was the fastest, losing nearly two months of ice cover per century. Lake Michigan also experienced rapid warming and more ice-free years.

Lake Superior is warming up three times as fast as the global average, which is around 0.61 degrees (0.34 Celsius) per decade.

- https://www.washingtonpost.com/w

The New York Solar Energy Society (NYSES)

a chapter of the American Solar Energy Society (ASES)

prepares consumer knowledge handouts about energy conservation and renewable energy and distributes Green Energy Times, a resource publication, to the public throughout eastern New York State. NYSES analyses legislation and state programs and visits with the staff of legislators in New York City, New York State and in Washington, DC.NYSES **NYSES is a volunteer, grassroots, membership organization serving the children, families, engineers, architects and teachers of New York State since 2007.**

Our Mission:
To encourage the understanding and use of solar energy technologies through public outreach, to be a source of sound technical knowledge and to provide a forum to address critical regional and state issues relating to solar energy solutions. We address the energy usage of all segments of society by increasing awareness of the benefits of renewables: solar, wind, biomass, geothermal ground source, tidal/wave energy and energy efficiency.

For more information, please contact:

New York Solar Energy Society
5270 Sycamore Avenue, BX NY 10471
www.nyses.org
917 974 4606

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By renewing your membership and/or making one time or periodic donations, you can help to sustain and expand the efforts and activities of the New York Solar Energy Society.

Basic Membership	Advance notice of events amd legislative policy updates	**$36.00/ year**
Professional Membership	Above benefits plus discount on event admissions	**$100.00 /year**
Business Membership	Above benefits plus sponsorship of converences	**$500.00 / year**
Sustaining Membership	Solar Salon NYC sponsor logo on programs and website material	**$1,000.00 /year**

Contribute on line via NYSES website www.nyses.org
or mail check to the address above
Thank you!

Please send your comments/suggestions via Contact-Us

The Board of Directors of the New York Solar Energy Society meets on the fourth Tuesday of each month via teleconference. Please contact-us **if you wish to attend.**

Monthly Update is compiled & edited by Yuri Kalina

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