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New York Solar Energy Society

Monthly Digest for October 2021

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National & International

Native opposition to Nevada lithium mine grows. The conflict starkly illustrates the tradeoffs involved in tackling climate change in a business-as-usual way.

According to the International Energy Agency, demand for lithium could rise forty-fold by 2040 if the world rapidly embraces electric vehicles, which use lithium-ion batteries.

- https://grist.org

The administration's push to improve U.S. grid cybersecurity defenses is running up against a patchwork of state-level regulations that could derail federal efforts to protect fast-growing renewable energy resources from hackers.

Experts warn that as distributed resources like solar and wind are added to the U.S. power grid, the increasing connectivity among electricity systems provides new opportunities for hackers to sow chaos in energy networks that fall under the jurisdiction of state rules.

Grid cybersecurity regulations from the Federal Energy Regulatory Commission and the North American Electric Reliability Corp. don't always apply to smaller generators like wind turbines or rooftop solar panels. These technologies tend to be left more exposed to hacking threats than the closely guarded, centralized power plants and transmission lines that make up the bulk power grid.

- https://www.eenews.net/

After water levels at a California dam fell to historic lows this summer, the main hydropower plant it feeds was shut down. At the Hoover Dam in Nevada — one of the country's biggest hydropower generators — production is down by 25%. If extreme drought persists, federal officials say a dam in Arizona could stop producing electricity in coming years.

Houseboat rests in a cove at Lake Powell near Page, Ariz., July 30, 2021 (AP Photo/Rick Bowmer)

- https://apnews.com/

As some provinces in China are rationing electricity, Europeans are paying sky-high prices for liquefied natural gas, power plants in India are on the verge of running out of coal, and the average price of a gallon of regular gasoline in the United States stood at $3.25 at the beginning of October— up from $1.72 in April.

The economic recovery from the pandemic recession lies behind the crisis, coming after a year of retrenchment in coal, oil and gas extraction. Other factors include an unusually cold winter in Europe that drained reserves, a series of hurricanes that forced shutdowns of Gulf oil refineries, a turn for the worse in relations between China and Australia that led Beijing to stop importing coal from Down Under, and a protracted calm spell over the North Sea that has sharply curtailed the output of electricity-generating wind turbines.

- https://www.washingtonpost.com

More than 20 federal agencies on October 7 released plans to improve the resilience of their facilities and operations against climate change.

The plans detail different steps being taken by different parts of the government. For example,

- The Transportation Department will add resilience criteria into some of its grant and loan programs.
- The Centers for Disease Control and Prevention will use a tool that provides real-time heat data to help states and localities prepare for extreme heat events
- The Defense Department will seek to use information on climate change hazards to military installations.
- The Justice Department will include resilience into its considerations for design and construction, as well as future leases.
- The Energy Department has said it will look at ways to create climate adaptation requirements for contractors and suppliers.

- https://thehill.com/

After Senator Joe Manchin III, the Democrat from coal-rich West Virginia, told the White House that he strongly opposes the program to rapidly replace the nation's coal- and gas-fired power plants with wind, solar and nuclear energy —it has been dropped from the budget bill pending in Congress,

Mr. Manchin has expressed concern that the clean electricity program could harm the economy of West Virginia, but has said little about the economic toll being felt from inaction on climate change.

No state in the contiguous United States is more exposed to flood damage than West Virginia, according to data released last week. Sixty-one percent of West Virginia's power stations are at risk of flooding, the highest nationwide and more than twice the average. West Virginia also leads in the share of its roads at risk of inundation, at 46 percent.

- https://www.nytimes.com/

This year the Nobel prize in physics went to three researchers who have studied complex,

Source: *The Economist*

chaotic and apparently random systems and developed ways to predict their long-term behaviour, with implications ranging from how to study the climate to the exploitation of exotic materials. Half of the award was shared by Syukuro Manabe of Princeton University and Klaus Hasselmann of the Max Planck Institute for Meteorology, in Hamburg. The other half went to Giorgio Parisi of Sapienza, the principal university in Rome.

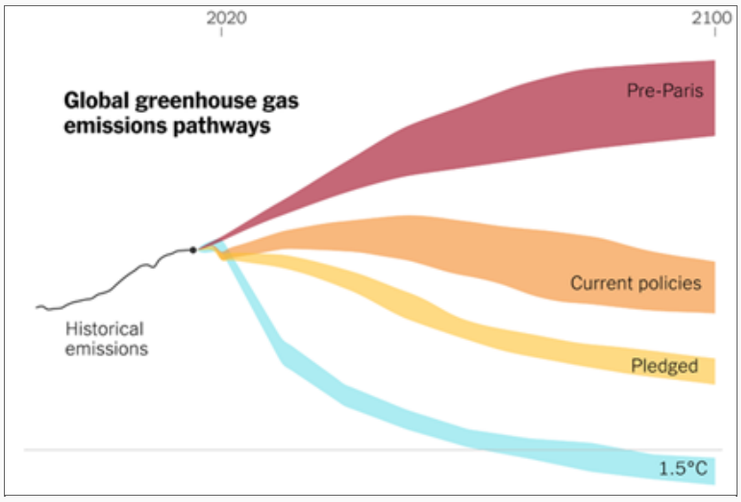
Drs Manabe and Hasselmann laid the foundations of the modelling of Earth's climate that led to "quantifying variability and reliably predicting global warming". Dr Parisi was awarded his share for discoveries around the "interplay of disorder and fluctuations in physical systems from atomic to planetary scales".

In the 1960s Dr Manabe, an atmospheric scientist, wove together emerging strands of understanding of the dynamics and thermodynamics of Earth's atmosphere to make the first reliable prediction that doubling the level of carbon dioxide present would also increase the planet's surface temperature.

In the 1970s Dr Hasselmann developed models to show how weather, despite being chaotic and unpredictable in the short-term, could yield reliable models to foreshadow Earth's climate over much longer periods. In describing his work he made an analogy to Brownian motion, the jostling movement of pollen grains in water that was first observed down a microscope by Robert Brown, a botanist, in 1827.

https://www.economist.com/s

CLIMATE EMERGENCY/ENVIRONMENT



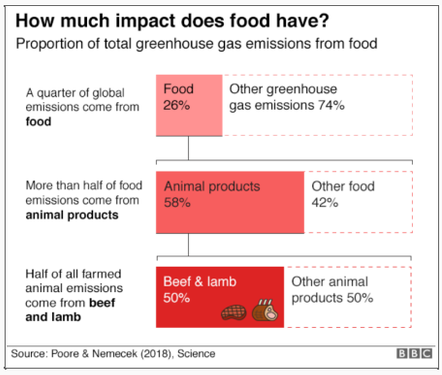
https://www.nytimes.com/

Leaked documents seen by BBC News show how countries in advance of the COP26 climate summit in November are trying to change a crucial scientific report on how to tackle climate change

The leak reveals several countries are asking the UN to play down the need to move rapidly away from fossil fuels, arguing that the world does not need to reduce the use of fossil fuels as quickly as the current draft of the report recommends. Reservations include,

- From Saudi Arabia: Eliminating phrases like 'the need for urgent and accelerated mitigation actions at all scales…'

- From Australia: Rejecting the conclusion that closing coal-fired power plants is necessary, even though ending the use of coal is one of the stated objectives the COP26 conference.
- From India: Warning coal is likely to remain the mainstay of energy production for decades because of what they describe as the "tremendous challenges" of providing affordable electricity. India is already the world's second biggest consumer of coal.
- Other countries, Saudi Arabia, China, Australia and Japan, argue in favor of emerging and currently expensive technologies designed to capture and permanently store carbon dioxide underground.
- Argentina, Norway and OPEC: take issue with the statement: "The focus of decarbonization efforts in the energy systems sector needs to be on rapidly shifting to zero-carbon sources and actively phasing out fossil fuels".
- Brazil and Argentina: argue strongly against evidence that reducing meat consumption is necessary to cut greenhouse gas emissions. (N, B., The two countries are among the biggest producers of beef products and animal feed crops in the world.)



- https://www.bbc.com/

We assess that climate change will increasingly exacerbate risks to U.S. national security interests as the physical impacts increase and geopolitical tensions mount about how to respond to the challenge," states the new National Intelligence Estimate (NIE) on climate, a first-of-its kind document by the Office of the Director of National Intelligence, released on October 21.

After four years of previous administration's routine suppression of climate related issues that did not match its official views of climate science, the Pentagon report in particular marks a shift in how the U.S. military establishment is incorporating climate issues into its security strategy.

Until now, when the Defense Department has considered climate change, it has tended to focus on how floods and extreme heat can affect military readiness rather than the broader geopolitical consequences of a warming world. Now it is worried that climate change could lead to state failure.

- https://www.washingtonpost.com/

In its "Roadmap to Build a Climate-Resilient Economy," the Biden administration characterized climate-related risks as falling into two categories: physical risks from extreme weather and what it called "transition risk" as the nation shifts away from a carbon-fueled economy.

The report outlines a range of pending and future actions meant to shield both the broader financial system and American households from climate-related risks. The administration highlighted the housing market, insurance and retirement funds as areas where Americans could personally feel the costs of climate change.

- https://thehill.com/

In advance of the COP26 Climate Change Conference in Glasgow in November, the International Energy Administration released its annual World Energy Outlook 2021(WEO).

The WEO-2021 predicts that under current climate policies, though new energy demand will be overwhelmingly met via renewables, net emissions will remain around current levels, continuing global temperature increase beyond 2.6 degrees Celsius in 2100. Conversely, the report finds that if net-zero emissions pledges released by world governments are fully implemented, demand for fossil fuels will peak by 2025 and global average temperature rise in 2100 will be around 2.1 degrees Celsius.

The report also warns against insufficient investment in the energy transition, particularly in developing countries. Without more clean energy investments, emerging markets could face a major energy pinch with continued depressed oil and natural gas spending and insufficient renewable generation. The report also finds that 40 percent of emissions reductions could come from investments that pay for themselves, such as in energy efficiency and controlling gas leaks.

>https://www.politico.-

also

- https://www.iea.org/reports/

The UN's main human rights body has overwhelmingly voted to recognize the right to a safe, clean, healthy and sustainable environment as a human right, and to appoint an expert to monitor human rights in the context of the climate emergency.

The human rights council passed the clean-environment resolution, which also calls on countries to boost their abilities to improve the environment, by 43-0 while four member states – China, India, Japan and Russia – abstained.

- https://www.theguardian.com/

RENEWABLE ENERGY

The American Bird Conservancy (ABC) has made a habit of obstructing wind energy projects — and become a go-to source for renewable energy opponents. ABC led a flock of fellow fowl enthusiasts and rural New York towns in a lawsuit to overturn the new Office of Renewable Energy Siting siting guidelines. Among their claims is that the office is captured by corrupt special interests who are eager to "level hilltops, degrade or destroy sensitive habitat, harm wildlife, [and] kill birds." If successful, ABC could halt Heritage, overturn New York's siting rules, and prevent the Empire State from meeting its lofty green energy goals. It's taken a similarly combative posture nationwide.

The organization as repeatedly deployed representatives to oppose wind energy projects, defang renewable energy legislation, influence journalism, and legitimize anti-wind activists and climate change skeptics through a powerful but misleading argument.

"Our wildlife should not be collateral damage in our effort to combat climate change, nor does it have to be," according to ABC's earlier statement.

A red-tailed hawk soars through a foggy morning near a row of windmills used for power generation in the Altamont Pass area outside Tracy, California. *Rick Loomis / Los Angeles Times via Getty Images*

Indeed, the very nature of wind turbines poses a legitimate threat to the winged. ABC, on the high side, claims more than 1 million birds are killed by wind turbines. (Mainstream scientists put the number below 500,000.)

These numbers pale in comparison to the hundreds of millions of birds killed in building collisions each year. Fossil fuels, meanwhile, wreak both immediate and long-term havoc on the avian population. While oil pits, for instance, may kill up to 1 million birds a year. A 2014 report from the National Audubon Society found that climate change would soon threaten the habitats of more than half of North America's 588 bird species. In its 2019 report, the group showed that two-thirds of North American birds faced total extinction from our warming planet. Among those most at risk is the ruby-throated hummingbird, which serves as ABC's mascot.

- https://grist.org/

Adding transmission capacity between the East and West power grid interconnections would reduce costs by allowing wind, solar and natural gas-fired generation to flow more freely across broad regions, according to a recently published study by the National Renewable Energy Laboratory (NREL).

Increasing transfer capacity between the two grids could produce $2.50 in benefits for every dollar spent on the new transmission facilities, according NREL.

- https://www.utilitydive.com/

It will cost $2.2 billion to $3.2 billion to build enough transmission in the PJM Interconnection to meet states' offshore wind and renewable portfolio standard goals through 2035, according to a study by the grid operator.

The transmission projects and renewable generation would lower customer costs by reducing the use of more expensive fossil-fueled power plants and removing transmission bottlenecks on the grid while allowing for more exports to the Mid-continent Independent System Operator.

- https://www.utilitydive.com/n

According to a new report from an independent financial think tank Carbon Tracker, solar and wind paired with storage will be cheaper to run than the majority of existing gas plants by the end of the decade.

Carbon Tracker researchers estimate that around half of operating gas plant capacity included in its model in Europe will be more expensive to run than wind or solar capacity coupled with battery storage by 2023. By the end of the decade the percentage is estimated to reach 85%. This process will take longer in the U.S.; by the early 2030s, around half of the country's gas plant capacity is estimated to be more expensive to run than renewables and batteries.

Gas plays an important role in the energy transition to achieve net zero target - balance between the amount of greenhouse gas produced and the amount removed from the atmosphere **-** by 2050. To achieve the target, gas plants will have to be shuttered. As the result, approximately $16 billion could be stranded* if profitable gas-fired units are forced to close, offset by an equivalent amount in savings from closing unprofitable gas plants.

- https://www.utilitydive.com/

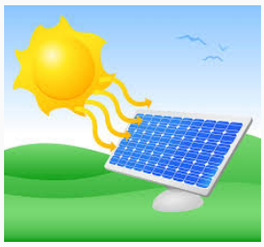
Stranded cost= **cost that an entity has incurred, and which it can no longer recover.*

The U.S. must install 85 GW of renewable energy each year through 2035 to achieve the emissions reductions targeted in the current Clean Electricity Performance Program legislation, according to an analysis by S&P Global Market Intelligence.

- https://www.utilitydive.com/n

California and Hawaii began requiring smart inverters for new distributed solar to avoid voltage issues on circuits associated with new solar installations. Smart inverters can regulate voltage, and are configured to do so in both states. Smart inverters can also provide other grid services, setting the stage for customers to be paid for those services.,
With the employment of smart inverters, new photovoltaic systems are actual correcting grid problems with voltage rise.

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



Solar

More than half of the global utility solar projects planned for 2022 could be delayed or canceled due to a worsening supply chain.

Rystad Energy estimates that 56% of projects -- or 90 gigawatts of solar capacity -- are threatened by commodity price inflation and supply chain bottlenecks. Costs for solar PV modules "have surged from below $0.20 per watt peak (Wp) in 2020 to between $0.26 and $0.28 per Wp in the second half of 2021 – a near 50% increase in a year," the report notes.

- https://www.renewableenergyworld.com/s

Surging solar costs, driven my raw material price increases and supply chain constraints, could delay or even cancel more than half of 2022's expected utility-scale solar buildout, according to a new report from energy consultancy Rystad Energy.

- https://www.cnbc.com/2

Prices for power purchase agreements have been rising steadily since the end of last year. According to solar developers, interconnection delays, permitting challenges, and supply chain constraints are likely to keep them high.

Rapidly falling prices have brought rooftop photovoltaics (PV) adoption into financial reach for more households. Despite these trends, low- and moderate-income (LMI) households remain significantly less likely to adopt PV than high-income households in the United States

To date, researchers have focused on demand-side explanations for adoption inequity, such as cash constraints, lower rates of home ownership, building structural issues, and language barriers. Likewise, LMI PV policies have been designed to address demand-side barriers, such as LMI adoption subsidies and LMI carve-outs in community solar programs

Supply-side factors may also pose barriers to PV adoption inequity. Supply-side barriers could take the form of PV installers targeting high-income customers. Income-targeted marketing could prevent LMI households from interacting with installers, an important step toward PV adoption. Furthermore, income-targeted marketing could reduce competition for LMI households, possibly resulting in those households receiving higher quote prices.

Income-targeted marketing, even if it is an expected supply-side feature of rooftop PV markets, would pose barriers to an accelerated transition to equitable rooftop PV adoption.

- https://www.sciencedirect.com/

Energy Storage

Honeywell is moving into the energy storage market with the announcement of a flow battery technology that can store and dispatch electricity for up to 12 hours.

The company will test a 400 kWh unit at Duke Energy's Mount Holly microgrid test bed facility in North Carolina in 2022. If successful, Honeywell says it aims to deploy a utility-scale pilot project of 60 MWh in 2023.

Non-flammable flow battery to be field tested at Duke Energy's Mount Holly, N.C. facility

The battery could have a lifespan of up to 20 years with little degradation, the company said.

Lithium-ion batteries are effective in storing wind and solar energy for hours and distributing it during peak times of the day. Flow batteries use a liquid electrolyte as a source of electricity, have more longevity and storage capacity than lithium-ion, while also carrying less safety risk. However, they also have a higher up-front cost and are less proven on the market.

- https://www.utilitydive.com

Several Australian companies are progressing with plans to recover materials for battery storage, implementing methods that range from extracting storage minerals from tailings (essentially mining waste), to creating scaleable, efficient, and sustainable recycling processes, as well as low-emission lithium extraction.

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

In light of a current limited availability of raw materials used to manufacture lithium-ion batteries -- the primary power source for electric vehicles - researchers and investors alike believe lithium-ion battery recycling is poised to make a big jump.

In June, the U.S. Dept. of Energy released a "National Blueprint for Lithium Batteries" that sets goals of establishing a secure pipeline for raw materials, domestic manufacturing, and enables recycling at scale.

- https://www.renewableenergyworld.com/

Koch Industries formed a partnership with Norway-based company FREYR to evaluate building battery production gigafactories in the United States.

The 50:50 joint venture with FREYR could result in factories with an initial production capacity of 50 GWh per year by 2030. The facilities would make batteries for the electric vehicle (EV) industry and utility-scale storage.

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

CATL, China's largest battery manufacturer, has announced it intends to invest $5 billion in a battery recycling factory to be located in Yichang, a city in Hubei Province which is in central China. The new factory will recycle used battery materials and produce materials including lithium iron phosphate, lithium cobaltate, and cathode materials such as graphite and phosphoric acid.

- https://cleantechnica.com/

Community Solar

The Department of Energy announced a target of the equivalent of five million homes powered by community solar energy by 2025.

The target would save $1 billion and contribute to administration goals of fully renewable electricity by 2035, according to the department.

Community solar has the potential to give low-income people more access to renewable energy. Phasing out fossil fuels in ways that do not disproportionately fall on working- and middle-class people has been a major concern for the current administration.

- https://thehill.com/policy

A report, Sharing the Sun: Community Solar Deployment, Subscription Savings, and Energy Burden Reduction, co-authored by National Renewable Energy Laboratory (NREL) and the University of Minnesota, shows the tremendous growth of community solar over the past decade, which now consists of about 1,600 projects in the United States exceeding 3.2 GW in capacity. According to the report, cumulative community solar capacity has grown by about 121% year over year since 2010, more than doubling in capacity on average.

- https://solarindustrymag.com/

To go from 600,000 community solar powered homes to 5 million in five years, as the Biden plan envisions means community solar by must grow by 700%. That is roughly equivalent to deploying 27.1 GWac / 34 GW of solar power.

That will require bringing online more than five times what was deployed in 2020, every year, for the next five years. For it to happen

- projects must make financial sense,
- projects must have a legislative path to market for their electricity, and
- projects must be able to connect to the power grid in a timely and cost-effective manner.
- https://pv-magazine-usa.com/

According to a study from Michigan State University's Product Center and Center for Economic Analysis expanding community-based solar energy projects that allow utility customers to purchase subscriptions for offsite generation would contribute nearly $1.5 billion to Michigan's economy and create thousands of jobs.

The study found a single 5 MW community solar project directly employs about 15 people and contributes nearly $3 million annually to gross domestic product, according to the report. The study also attributes hundreds of jobs and more than $400 million in labor income to the operations and maintenance of these projects.

- https://mibiz.com/sections/

Michigan's two largest energy providers, DTE Energy & Consumers Energy announced the launching of *MI Community Solar*, a first-in-the-nation education campaign to promote the efforts of large and diverse communities of Michiganders going solar together.

- marketscreener.com

Green Hydrogen

In Implementing Hydrogen Strategies Targeted Approaches to Its Production and Usage Are Essential as,

- 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/t

More:

UN Climate Champions launch 'guiding principles' for climate-aligned hydrogen

The extent to which green hydrogen benefits the climate will depend on how much hydrogen is ultimately leaking.

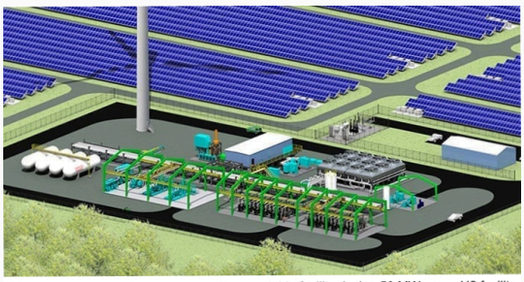
Scientists have warned that hydrogen could be a significant "indirect" contributor to the greenhouse effect when it leaks through infrastructure and interacts with methane in the atmosphere. Its effect on the climate has so far remained largely unexplored.

Releasing water vapor only when burned, hydrogen is a potent short-lived indirect greenhouse gas that is 200 times more potent than carbon dioxide at the time it is released, kilogram for kilogram. If one ton of hydrogen consumption leaked between 5-30 kg of the gas (a number comparable to consumed methane leakage today), it would have the same climate impact as 1-6 tons of CO2-equivalent.

- https://www.euractiv.com/

Global electrolyzer capacity for producing hydrogen could reach up to 89 GW by 2030 thanks in part to $37 billion in government spending and $300 billion in private sector investments, according to a report by the International Energy Agency.

· However, this falls well short of the $1.2 trillion in spending the IEA anticipates will be needed for the hydrogen industry to grow at the rate required for the world to achieve net zero emissions by 2050.



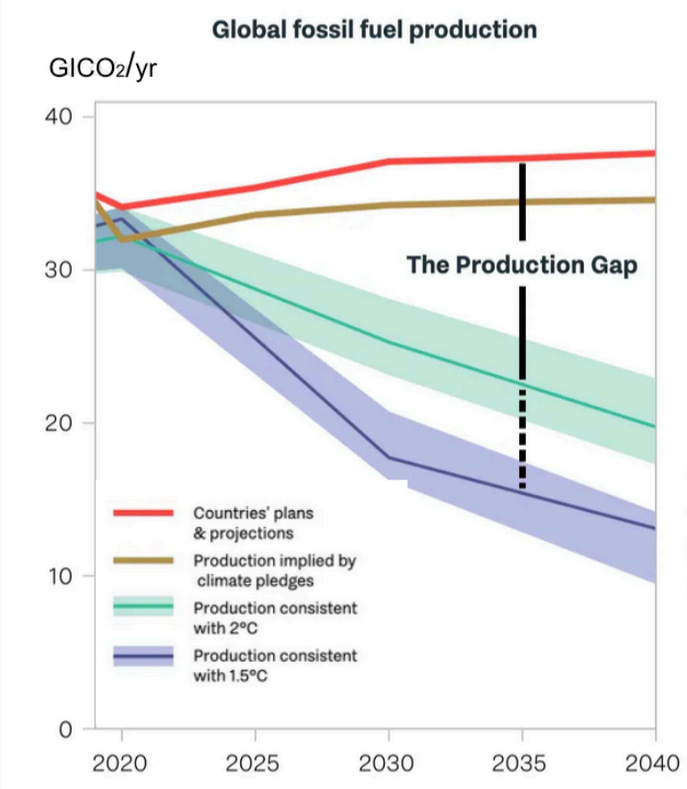
Potential site layout for the modular & expandable facility design 50 MW green H2 facility
Source: *New Energy via Power Magazine*

- https://www.utilitydive.com/n

Fossil Fuels

A report, produced by the UN Environment Program (UNEP) and other researchers, found that global production of oil and gas is on track to rise over the next two decades, with coal production projected to fall only slightly.

This results in double the fossil fuel production in 2030 that is consistent with a 1.5 degrees Celsius rise.



Detailed analysis of 15 major fossil fuel-producing nations found that the United States, Canada, Australia, Saudi Arabia, and China all project increases in oil and gas, while India and Russia intend to increase coal production. Only two of the countries expect oil and gas production to decline: the United Kingdom and Indonesia. The report also found that countries have directed more than $300 billion of new public finance to fossil fuel activities since the beginning of the Covid-19 pandemic, more than that provided for clean energy.

The crucial COP26 climate summit started in Glasgow. The world's nations must pledge carbon-cutting measures that will keep alive hopes of restricting the rise in global heating to 1.5 degrees Celsius (about 2.7 degrees Fahrenheit). Current pledges would mean a catastrophic 2.7 degrees Celsius rise, or about 4.9 degrees Fahrenheit.

- https://thebulletin.org/2

Sen. Joe Manchin Has Been Fighting to Keep Billions in Subsidies for Fossil Fuel Industry

- https://theintercept.com/2

Photo: Yasin Ozturk/Anadolu Agency via Getty Images

A coalition of investors with more than $60 trillion in assets under management is preparing to call on electric utility companies globally to move up their timeline by as much as 15 years to bring their net greenhouse gas emissions to zero.

Utilities account for about 40% of emissions worldwide, more than any other sector. Many of them have committed to reach net-zero emissions by 2050, a target that scientists say must be met to avert global warming of more than 1.5 degrees Celsius.

- https://www.reuters.com/

Since 2010, the private equity industry has invested at least $1.1 trillion into the energy sector — double the combined market value of three of the world's largest energy companies, Exxon, Chevron and Royal Dutch Shell — according to new research. The overwhelming majority of those investments was in fossil fuel according to a new analysis by the Private Equity Stakeholder Project. Only about 12 percent of investment in the energy sector by private equity firms went into renewable power, like solar or wind, since 2010.

By bottom-fishing for bargain prices, the buyers, often private equity-backed firms, are keeping some of the most polluting wells, coal-burning plants and other inefficient properties in operation.

In the fossil fuel industry, one effect of sales to private equity investors is to transfer those assets, and their emissions and other environmental hazards, further from the public eye. Though all companies, public or private, must follow environmental regulations, private firms are exempt from many public financial disclosure rules.

- https://www.nytimes.com/

Among the 100 biggest corporate polluters over the past half-century, McKinsey has advised at least 43 in recent years, including BP, Exxon Mobil, Gazprom and Saudi Aramco,

generating hundreds of millions of dollars in fees for the firm. In 2018, those clients alone — not including scores of other polluters advised by McKinsey — were responsible for more than a third of global carbon emissions, based on figures from the Climate Accountability Institute.

A McKinsey spokesman said the firm had already addressed the issues and had created a new platform to help clients cut their emissions.

- https://www.nytimes.com/

Research by consulting group M.Cubed indicates that the gas-fired generator population in California climbed by double-digit percentage points in the past year. Two air quality districts, the South Coast and Bay Area, collectively are home gen-sets that account for 12.2 GW of electricity capacity, close to 15 percent of California's entire grid. Of that total generator-set,, more than 20,000 of which, or 85%. are diesel-fueled. Many businesses and mission critical services such as hospitals and military bases are bolstering their backup plans with microgrids which include solar and storage combinations. A large part of those microgrids also include a gen-set, fired by natural gas or diesel, to deploy when circumstances require it.
https://www.power-eng.com/

NORTH-EAST

New York

A seven MWattDC ballasted fixed tilt system, will be constructed on the Depew Village's abandoned landfill, giving second life to the land atop the waste management system. The clean solar energy can be utilized by local businesses, schools, and municipalities to decrease their energy costs.

- https://solarbuildermag.com/projects/n

The region's largest community solar rooftop installation began producing energy in Melville last month.

Tens of millions of dollars in incentives from the state that helps make city-friendly "community solar" developments economically feasible are sun-setting for new projects. The disappearance of incentives is threatening clean energy projects on tap for NYC — along with the local jobs and energy savings that come with them. Without the credit, the value of solar will be cut in half, developers warn.

Unlike sprawling areas upstate, the city's solar projects tend to be smaller and more expensive, given the price of labor and trucking equipment into the city. Costs to get customers on board are high.

- https://www.thecity.nyc/e

Related:

- https://solarbuildermag.com/

Several towns in New York's Niagara County promise to continue fighting local solar development after a state supreme court judge denied their petition related to a state energy siting office's handling of a 100 MW solar array. *(Lockport Union-Sun & Journal)*

- (Northeast Energy News by the Energy News Network -- via email, 10/13/2021)

Nestled in New York's picturesque Finger Lakes region. a plant, named Greenidge Generation, lay dormant for more than five years. It was converted from coal to natural gas and fired back up in 2017 by a private investment firm with the intent to supply power to the grid.

Now, in addition to supplying power, the company has an industrial-scale bitcoin mining business on the property, an operation that's been growing. Recently, the number of mining machines has doubled from around 7,000 to over 15,000. In March the plant powered 19 megawatts of mining capacity. The document shows they expect that to more than quadruple by the end of 2022.

Producing power requires millions of gallons of water to be drawn from Seneca Lake to help cool the process. That water is then permitted to be sent back into the lake, measurably warmer than it was when it came

https://www.cbsnews.com/news

Connecticut

- Connecticut has "multiple pathways" to achieving a 100% clean electricity system by 2040, but getting there will require wholesale market reforms alongside the addition of energy storage and demand management resources, according to the state's final 2020 Integrated Resources Plan (IRP).
- The plan also calls for the state to "maintain historic deployment levels of distributed generation" and remove barriers to participation in clean energy programs for underserved communities.
- To begin implementation of the plan, the CT Department of Energy and Environmental Prodection launched stakeholder processes to consider how its procurement authority can be used for energy storage, and to seek input on potential changes to the electric sector's greenhouse gas accounting methodology.

https://www.utilitydive.com/

Massachusetts

To usher in dozens of gigawatts of wind power in the next few decades, Massachusetts Gov. Charlie Baker pitches the creation of a $750 million clean energy investment fund and the elimination of an offshore wind price cap.

Small-scale fishers dread the insurgence of planned offshore wind projects along their traditionally worked coasts, with one New York fisher calling the farms "the final nail in the coffin" for their industry

- Northeast Energy News 10-14-2021

Massachusetts has found early success with its behind-the-meter energy storage incentive program. The ConnectedSolutions program compensates residential and commercial customers for allowing utilities to draw from energy from their grid-connected batteries and/or to curtail energy use via smart thermostats or electric vehicle charging at times of peak electric demand.

ConnectedSolutions had about 34,000 customer participants with 310 megawatts of capacity enrolled by the end of 2020, according to a report compiled by Applied Economics Clinic for the Clean Energy Group.

"The Massachusetts ConnectedSolutions program is a nation-leading program that has reduced expensive peak demand, provided cost savings, enhanced resiliency for participating residential, commercial, and industrial customers....," authors of the report wrote.
https://www.power-grid.com/

New Jersey

The state is planning to make permanent a pilot program that delivers electricity from community solar projects to low- and moderate-income communities that mostly have not benefited from cheaper solar power.

A pilot program has proved to be surprisingly popular during its two years. In its second year, more than 400 applications were received from solar developers seeking to build 800 megawatts of solar projects to deliver solar energy to customers.

- https://www.njspotlight.com/

Vermont

A community solar array mounted on the roof of the Vermont Mill Properties complex is now producing power to benefit its commercial and residential subscribers, the developer announced, hosting power for people as far east as Brattleboro and as far north as Poultney and Winhall.

Under Vermont's net-metering and group net-metering laws, "revenue from the 'sale' of solar electricity into the grid is distributed into the utility accounts of the owners of the shares, in proportion to their share of ownership."

The new community solar project also allows for remote monitoring for the array's production, so that subscribers can see the performance of the mutually owned and shared solar array.

- Bennington Banner

Also

- https://www.jdsupra.com/

DATA

From the US Energy Information Agency (EIA) Forecasts:

Share of electricity generation produced by natural gas in the United States will average 36% in 2021 and 35% in 2022, down from 39% in 2020. In 2021,

Lower price responsiveness of coal for electricity generation, which is likely the result of constraints on coal supply and low coal stocks, is contributing to upward pressure on natural gas prices.

Panned additions to U.S. wind and solar capacity in 2021 and 2022 will increase electricity generation from those sources.

The U.S. electric power sector added an estimated 14.6 gigawatts (GW) of new wind capacity in 2020. 17.1 GW of new wind capacity is estimated to l come online in 2021 and 6.5 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 16.0 GW for 2021 and 18.3 GW for 2022.

Significant solar capacity additions in Texas are expected during .

After increasing by 4.5 GW in 2020, small-scale solar capacity (systems less than 1 megawatt) will grow 5.8 GW and 7.8 GW in 2021 and 2022,

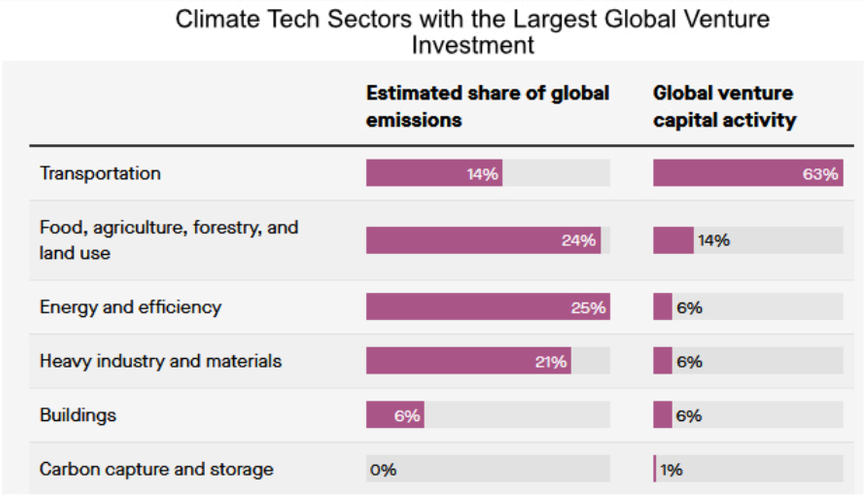
U.S. energy-related carbon dioxide (CO_2) emissions decreased by 11% in 2020

Energy-related CO_2 emissions are expected to increase about 8% from the 2020 level as economic activity increases and leads to rising energy use with no change in the emission levels in 2022.

Average U.S. household expenditures for all major home heating fuels are projected to increase significantly this winter primarily because of higher expected fuel costs as well as more consumption of energy due to a colder winter

From EIA's *International Energy Outlook 2021*

- If current policy and technology trends continue, global energy consumption and energy-related carbon dioxide emissions will increase through 2050 as a result of population and economic growth.
- Renewables will be the primary source for new electricity generation, but natural gas, coal, and increasingly batteries will be used to help meet load and support grid reliability.
- Oil and natural gas production will continue to grow, mainly to support increasing energy consumption in developing Asian economies.



Quartz | qz.com Data: PWC Note: Carbon capture and storage provide negative emissions, removing 5 to 15 GtCO2/year by 2050.

OF INTEREST

Some people and businesses seeking to use solar panels, batteries and electric vehicles find they can't because utility equipment needs an upgrade.

- https://www.nytimes.com/2

The Reads

The first big energy shock of the green era

Since May the market price of a basket of oil, coal and gas has soared by 95%. Britain, the host of the COP26 summit, has turned its coal-fired power stations back on, American petrol prices have hit $3 a gallon, blackouts have engulfed China and India, and Vladimir Putin has just reminded Europe that its supply of fuel relies on Russian goodwill.

- https://www.economist.com/l

Is renewable energy the answer to the climate crisis?

Renewable energy is seen by many to be the future, and as the world fights to prevent the global temperature from increasing past 1.5c, the switch to renewable energy sources seems to be the most effective way to ensure success.

- https://www.jpost.com/

Miscellany

Scientists from the University of California-Davis, Lancaster University, and Ludong University in China published research showing that utility-scale solar facilities can have a cooling effect not only on the land covered by the array, but also in the surrounding area.

Solar facilities were found to produce "cool islands" that extend up to 700 meters from the boundaries of the arrays. Land surface temperature was reduced by up to 2.3 degrees Celsius (3.6 Fahrenheit) at 100 meters away; the cooling effects tapered off exponentially to 700 meters.

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

No one knows when fusion energy will become commercially viable, but driving the private investments is a rising alarm about global warming. Scientists figure that to attain nuclear fusion they need to reach 100 million degrees Celsius, or about seven times the temperature at the core of the sun.

Why would investors put money into a far-out quest that has never made a nickel? They are attracted to the prospect of an early entry into a potentially game-changing technology: a fusion reactor that produces far more energy than goes into it. Such an achievement could have enormous commercial promise.

- https://www.nytimes.com/

More on the Topic:

- https://www.intechopen.com/

A wireless EV road works like this: As a car drives over it, the vehicle's battery is charged by pads or coils built under the surface of the street using magnetic induction. It doesn't give

the car a full charge, but it helps add some additional mileage to a vehicle before its next complete powering up. Michigan will construct the nation's first wireless electric vehicle charging road — a one-mile stretch in the Metro Detroit area.

- https://grist.org/transportation/m

Applied research at the U.S. Department of Energy's (DOE) Argonne National Laboratory suggests that replacing lithium-ion batteries with better technology may be possible sooner than expected.

Lithium-ion batteries still require a liquid or gel to allow the battery to be charged and discharged; that is why older batteries sometimes leak with age. A new, safer generation of batteries does not rely on liquids or gels. Instead, these solid-state batteries use a very thin, solid film to keep charge-generating parts (cathodes and anodes) separate and enable the battery to be charged and discharged.

The manufacturing processes being developed for the solid state batteries offer faster processing, pressureless sintering, large-scale uniformity and higher density — over those currently used. The higher density improves how long a battery can be used.

Sintering involves heating a powder material until it slowly forms into a solid material without any holes or pores. This process is important in solid-state batteries because the thin material separating the cathode and anode must be strong enough and dense enough to withstand handling during manufacture, assembly and operation.

The tasks ahead is to develop manufacturing methods that will make the solid state batteries cost competitive with traditional lithium-ion batteries.

- https://cleantechnica.comf-batteries/

A proposed facility in California will use artificial intelligence-enabled concentrated solar technology. Concentrated solar energy company Heliogem said its baseline system will provide industrial-grade heat that will be capable of replacing fossil fuels in processes including the production of cement, steel, and petrochemicals. Its technology is also expected to enable power generation through the addition of a supercritical CO2 turbine and green hydrogen fuel production in combination with an electrolyzer. A full Notice to Proceed and construction to begin are expected in 2022.
https://pv-magazine-usa.com/

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:

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Join and Support NYSES -- http://nyses.org/Main/Join

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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