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New York Solar Energy Society

Monthly Digest for December 2021

WISHING YOU A HAPPY AND HEALTHY 2022

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NATIONAL & INTERNATIONAL

The Bureau of Land Management (BLM) and Department of Interior have taken first steps on federal land to Promote County-scale of Low Impacts. They will generate a total of up to 40 megawatts (MW) of solar energy on 2,000 acres of land in Southern California.

The BLM expects to immediately approve the Barren Ridge, Rosamond, the 580 MW Oberon, or 2,250 acres of public lands, and will be capable of producing 125 MW, the Western Antelope Blue Sky Ranch in Riverside County.

The three large solar farms are the first projects approved under the Desert Renewable Energy Conservation Plan (DRECP) in the desert regions of seven California counties.

- https://www.dailycal.org/

Senator Joe Manchin III: 10 steps a Dairy of Texas that drove him to oppose President Biden's climate agenda. Sen. Joe Manchin III, D-W.Va. did not actually cover the issue that has always propelled his political career as a Democratic mavericks: climate change.

Instead, the Senate Energy and Natural Resources chairman on Sunday, have always had a special relationship with the coal industry, a Manchin family business, and the 10,000 people who directly supply coal from abandoned mines to a Manchin pulverizing power plant in the state.

He mentioned campaign donations from the oil, coal and gas industries that are other senator in the current election cycle.

The president of the Marathon Cape Canaveral Spaceport has had conceded to Mr. Manchin that the clean energy tax credits would be a death knell for the state's coal industry. Even though the clean energy tax credits would be phased out from the mix, he said the coal industry still seek the incentives as a threat to its survival.

- https://www.dailycal.org/

The Environmental Protection Agency (EPA) announced Friday that it will put the first 6 greenhouse gas emission standards on heavy-duty trucks and buses, including 18-wheelers and Tractor-Trailers. Supertrucks and Supertrucks 2 programs, which have supplied cities are currently unfunded, with low-income and non-attainment communities affected by proximity to them.

- https://hdt.com/

Alaska Australia A-P Virginia Day, a December Record

- https://www.dailycal.org/

The Association Alaska is the deadliest tornado event in modern Kentucky history. The National Weather Service is consecutive confirmed, pointing to official records that began in the 1950s. At least 74 tornadoes touched down in more than six states, as a powerful storm system moved across the Central and southern U.S., the National Weather Service said.

- https://www.dailycal.org/

A massive, multi-hazard storm unprecedented for mid-December in the Plains and Upper Mississippi Valley and Great Lakes region. Tornadoes from New Mexico to Wisconsin December 10th. Many of the events this year, including this one, have the hallmarks of climate change.

- https://www.dailycal.org/

Voluntary pledges by major U.S. electric utility companies could reduce greenhouse gas emissions by an estimated 10 million tons of carbon dioxide (CO2) in 2030 U.S. power sector. Many of the events this year, including this one, have the hallmarks of climate change.

- https://www.dailycal.org/

The decision of a Florida one Wish Antarctic glacier does the opposite: it moved to more than 1 mile (2 km) before 1945 — and so our chart starts looking it back to 1945 — the glacier has been in a state of rapid retreat. Its ice shelf, which has been in place for at least 10,000 years, has thinned, fractured, and disintegrated. Its tributary glaciers, which have been in a state of rapid retreat, have sped up, and have lost their floating ice tongues, or tongues that have been floating in seawater for about 2 centuries or more.

CLIMATE EMPHASIS ENVIRONMENT

A large dip, or trough, in the jet stream across the West is allowing frigid conditions and a relentless series of storms that brought record-breaking snowfall into the Sierra Nevada Mountains. The snow has created dangerous mountain travel and has closed the shut down of several ski resorts.

- https://www.dailycal.org/

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RENEWABLE ENERGY

The Biden administration has determined wind farms offshore New Jersey and New York would cost power and a major disruption to the local environment. Leasing a site hundreds for lease sales in the region.

- https://www.dailycal.org/

The first power was generated by the world's largest offshore wind farm, announced offshore wind developer Ørsted. Located off the coast of Yorkshire, in the North Sea, the Hornsea project is the second operational of a four-segment project.

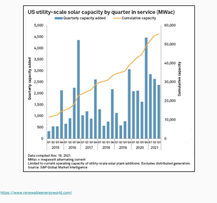
Ørsted said the Hornsea project, which will supply 20.9 MW turbines made by Siemens, which will give power to around 1.4 million homes. The offshore substation is located 69 miles (120 km) from the shore, in waters under protection conditions on the Dogger Bank. The wind farm will be located approximately 80 miles offshore of the coast. Siemens Gamesa, which supplied the turbines, said the project is expected commencing in 2022.

- https://www.dailycal.org/

To drive down the cost of technical, the National Renewable Energy Laboratory (NREL) and Sandia National Laboratory (SNL) are developing the Solar Energy Market Research Tool (SEMRT) to Helioscope Commercial (Helioscope).

Helioscope is a cloud-based component of commercial-only solar design software. Although it is not as sophisticated as the SEMRT, it is free to use and is easier to learn. Helioscope is a cloud-based, web-based,

solar generation.



- https://www.microgridknowledge.com/

A key input to the batteries that power electric vehicles and smartphones has more than tripled in price this year, as investment in the EV industry skyrockets.

- https://www.axios.com/

In Q2 2021, the US solar market installed 5.7 GW_{dc} of solar capacity, a 45% increase over the second quarter of 2020 and the largest Q2 on record.

Solar accounted for 50% of all new electricity-generating capacity added in the US in the first half of 2021.

Residential solar was up 2% over Q1 2021, but up 46% from Q2 2020.

With 974 MWdc installed, volumes were on par with Q4 2020 – the largest quarter on record.

Community solar was up 16% over Q2 2020 with 177 MW_{dc} installed, and commercial solar was up 31% over the same quarter last year with 354 MWdc installed.

Utility-scale solar set another record for second-quarter installations at 4.2 GW_{dc}.

A total of 9.3 GW_{dc} of new utility-scale solar power purchase agreements were signed in Q2 2021, bringing the utility-scale contracted pipeline to nearly 85 GW_{dc}.

- https://www.seia.org/

OF INTEREST

Anaerobic digestion of dairy manure and other organic material (e.g., food waste) produces biogas that can be used for renewable energy options. The options in use today include generating electricity and heat using a combined heat and power (CHP) system and producing renewable natural gas (RNG).

Other systems have been proposed to work with anaerobic digestion or on their own; these include hydrothermal liquefaction (HTL) to produce biocrude oil, pyrolysis to produce biochar, and pelletizing manure for combustion. CHP systems operating on biogas can use different prime movers, including the common reciprocating internal combustion engine, a gas turbine (e.g., microturbine), and a fuel cell.

- https://www.energy.gov/

For years, researchers have been conducting environmental life cycle assessments (E-LCA), in which they comprehensively and systematically calculate the environmental impacts of a product all the way from the extraction of raw materials required to make it to its use and ultimate disposal. More recently, researchers have attempted to develop similar frameworks to evaluate social

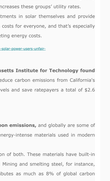
life cycle assessments (S-LCA), which can be used to understand how emerging technologies affect human health and well-being.

After studying the impacts of mining cobalt—a common ingredient in lithium-ion batteries—on communities in Africa's Democratic Republic of the Congo (DRC), an interdisciplinary team of researchers led by Northwestern University is calling for more data into how emerging technologies affect human health and livelihoods

The researchers found cobalt mining was associated with increases in violence, substance abuse, food and water insecurity, and physical and mental health challenges. Community members reported losing communal land, farmland and homes, which miners literally dug up in order to extract cobalt. Without farmland, Congolese people were sometimes forced to cross international borders into Zambia just to purchase food.

- https://phys.org/news

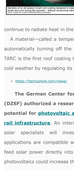
The Air Force Research Laboratory and Northrop Grumman have successfully converted solar energy to radio frequency, an essential first step toward a future satellite system that could beam energy from space to soldiers on the ground.


Source Image: A SFPA is a source-accurate radio frequ power system.

The system is being developed in an effort to deliver reliable solar power to remote military forces without having to carry around large solar panels with them.

- https://breakingdefense.com/

Solar redox flow cell for residential energy storage was designed by scientists in Portugal to optimize light absorption by the semiconductor and ensure an effective diffusion of redox species while offering minimal electronic and ionic transport resistance. The cell has a 25cm2 photoactive area and relies on ferrocyanide/anthraquinone redox flow chemistry and a nanostructured hematite photoelectrode.


The SolarFlowCell cell - Image credit:Elias

Two of the biggest challenges these batteries must overcome, along with other minor issues, are the fact that their performance is restricted by inefficient photoelectrochemical reactions and that their storage capacity is limited by the physical dimension of solid electrodes.

With this in mind, scientists at the University of Porto have recently developed a solar redox flow cell for decentralized, residential energy storage. Called SolarFlowCell, the device was designed to optimize light absorption by the semiconductor and ensure effective diffusion of redox species while offering minimal electronic and ionic transport resistance. It is described in the study "A 25 cm^2 Solar Redox Flow Cell: Facing the Engineering Challenges of Upscaling," published in *Advanced Energy Material*

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

Comment:

Big utilities are bent on furthering their monopolies and expanding their record-breaking profits even more – all at the expense of consumers. They are pushing the Florida Legislature to essentially do away with net metering and the benefits it brings to homeowners.

They also have a history of using front-line communities and people of color to shield their greedy intentions, going so far as claiming that net metering actually increases these groups' utility rates.

This simple isn't the case. Solar homeowners make investments in solar themselves and provide power that adds a net benefit to the energy grid. This reduces costs for everyone, and that's especially important for disadvantaged customers suffering from skyrocketing energy costs.

- https://www.yahoo.com/news/opinion/2021/12/23/john-bush-back-solar-power-users-softer-deadlines-based-1857675862/

Researchers at Stanford University and the Massachusetts Institute for Technology found that extending Diablo Canyon's life by 10 years would reduce carbon emissions from California's power sector by more than 10 percent annually from 2017 levels and save ratepayers a total of $2.6 billion.

- https://www.power-eng.com/

Buildings are responsible for 40 percent of global carbon emissions, and globally are some of the largest energy consumers. That's partly because of the energy-intense materials used in modern construction, such as cement and steel.

Trusses are typically made of wood or steel or a combination of both. These materials have built-in carbon emissions that come from the way they are produced. Mining and smelting steel, for instance, requires an immense amount of fuel. Steel production contributes as much as 8% of global carbon emissions

The new computational tools developed by scientists at MIT could help chip away at the environmental impact of the construction materials. Their algorithm helps to pick up the optimal combination of wood and steel for the truss design while minimizing carbon emissions.

- https://www.architecturerenewable.org/

Scientists have developed an all-season smart-roof coating that keeps homes warm during the winter and cool during the summer—without consuming natural gas or electricity. Research findings reported in the journal *Science* lead to a groundbreaking technology that outperforms

Image credit: Jeffrey Grossman, Lucas Hanson, Yanpei Tian, Zhenpeng Zhao, Jeffrey Wicks, Xiaobo Yin, Xiaoqing Qian, Tengfei Luo, Gang Chen

commercial cool-roof systems in energy savings.

Today's cool roof systems, such as reflective coatings, membranes, shingles, or tiles, have light-colored or darker "cool-colored" surfaces that cool homes by reflecting sunlight. These systems also emit some of the absorbed solar heat as thermal-infrared radiation; in this natural process known as radiative cooling, thermal-infrared light is radiated away from the surface.

The problem with many cool-roof systems is that they continue to radiate heat in the winter, which drives up heating costs.

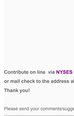
A material—called a temperature-adaptive radiative cooling or TARC—can enable energy savings by automatically turning off the radiative cooling in the winter, overcoming the problem of overcooling. TARC is the first roof coating that automatically switches between cooling in hot weather to warming in cold weather by regulating its rate of radiative cooling.

- https://techxplore.com/news/

The German Center for Rail Transport Research (DZSF) authorized a research project to explore the potential for photovoltaic applications on and in the rail infrastructure. An interdisciplinary team of rail and solar specialists will investigate which photovoltaic applications are compatible with the rail infrastructure to feed solar power directly into the rail power network. In addition, it should be determined how much photovoltaics could increase the share of renewables in traction current.

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

The Reads



In Idaho, Arizona, Nevada, and other states, the administration's promise to safeguard Native American resources is colliding with one of its other priorities: starting a revolution in renewable energy to confront climate change.

The push to unearth new minerals presents a hard choice for the Biden administration in politically divided Western states where mining remains an important source of jobs and political power.

- https://www.nytimes.com/

There were heavy rains (New York City beat its rainfall record twice in eleven days); unprecedented heat waves, wildfires, and damaging December tornadoes. There was a big global conference: the price of renewable energy fell some more ; and a record amount of solar power and wind power was produced, but not at a pace fast enough to catch up with climate change.

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

The New York Solar Energy Society (NYSESS)

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. NYSESS analyzes 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 and legislative policy updates **$36.00/ year**
Professional Membership	Advance notice, plus discount on event admissions **$100.00/year**
Business Membership	Above benefits plus sponsorship of conferences **$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: Yur Kalna

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