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Energy Newsletter

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FACEBOOK AND CARNEGIE MELLON PARTNER TO USE AI FOR STORAGE SOLUTIONS

On 14 October 2020, Facebook and Carnegie Mellon University released publicly a dataset of 1.3 million electrocatalyst simulations, a result of a partnership to use artificial intelligence to find new electrocatalysts to store renewable energy. The 1.3 million simulations of the quantum mechanical interactions between molecules of two chemical compounds when they come into contact—Called Open Catalyst 2020—is the largest such data set ever assembled and may enable researchers to train a machine learning algorithm to begin to make accurate predictions about these chemical interactions.

Simulating the atomic-level interactions of two chemicals is usually extremely complicated and can take weeks to months. Modern labs, using a modeling technique called density functional theory, can simulate at most 40,000 compounds per year.

The Facebook and Carnegie Mellon process promises an improved timeline, taking 12-72 hours to create each set of simulations. The partnership hopes to be able to train an algorithm that might be able to make accurate predictions about the catalytic potential of two compounds in just seconds, thus dramatically reducing the time and costs of this process.

EPA PROPOSES DRAFT RULE LIMITING COAL PLANT EMISSIONS

On 15 October 2020, the Environmental Protection Agency (EPA) issued a draft rule (Draft Rule) that would require coal-fired power plants in a dozen states either install new controls on nitrogen oxides (NOx) or make better use of currently employed technologies. The Draft Rule is the EPA's response to the 2019 ruling by the United States Court of Appeals for the D.C. Circuit in Wisconsin v. EPA. In the case, the Court remanded EPA's 2016 Cross-State Air Pollution Rule (CSAPR), which failed to fully eliminate significant contribution to nonattainment and interference with maintenance of 2008 ozone National Ambient Air Quality Standards (NAAQS) from upwind states by downwind areas' attainment dates.

The Draft Rule's focus is to resolve 21 upwind states' remaining “good neighbor obligations” under 2008 ozone NAAQS. EPA's proposal draws from the agency's latest modeling to assess air quality and nonattainment and maintenance. That modeling determined for 12 of the 21 states the D.C. Circuit determined the 2016 CSAPR update was an insufficient remedy, their projected 2021 emissions will contribute at or above the threshold of one percent of the NAAQS (0.75 parts per billion) to nonattainment in downwind states. Those states include Illinois,

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Indiana, Kentucky, Louisiana, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania, Virginia, and West Virginia.

EPA proposes to issue new or amended Federal Implementation Plans to revise state emission budgets that reflect additional emissions reduction from electricity generating units (EGU) beginning with the 2021 ozone season and to adjust the 12 states' emission budgets for each subsequent ozone season through 2024. The agency also proses to authorize a one-time conversion of allowances banked from 2017-2020 under CSAPR NOx Ozone Season Trading Program and to not include limits on ozone season NOx emissions from non-EGU sources. The EPA is under a court order to finalize this proposed action by 21 March 2021.

AMERICAN CORPORATE RENEWABLE PROCUREMENTS JUMP BY 45% IN 2020

In 2020, corporations operating in the United States added nearly 8 GW of wind and solar installations to their corporate procurements, an annual increase of 45%. This wave of new procurements is led by 220 corporations operating in the United States, 40% of which have benchmarks increasing through the mid-2020s. The power purchase agreements that make these deals possible are expected to lay the groundwork for development of 44 to 72 GW of wind and solar between 2021 and 2030. For illustration, 1 GW of solar can power up to about 750,000 homes and generates the equivalent of about two coal-fired power plants.

The United States is already the global leader in corporate procurements of renewable energy, making up 60% of the global market. The United States' tax incentives, high-energy use assets like data centers, and wholesale power market structures are important factors in the country's dominance in this market. Although corporate renewable procurements have historically been driven by tech companies, such procurements are growing rapidly in other industries with high-energy consumption footprints, such as manufacturing and telecommunications.

CALIFORNIAN COMMUNITY CHOICE AGGREGATORS LEAD THE WAY ON LONG-DURATION STORAGE

On 15 October, 2020, a joint coalition of eight California community-choice aggregators published a request for offers for long-duration energy storage capacity. The coalition is comprised of Central Coast Community Energy, CleanPowerSF, Marin Clean Energy, Peninsula Clean Energy, Redwood Coast Energy Authority, San Jose Clean Energy, Silicon Valley Clean Energy, and Sonoma Clean Power (the Joint CCAs). The Joint CCAs are seeking to procure long-duration energy storage to enhance integrating their respective renewable energy portfolios into the grid and to meet California's aggressive greenhouse gas reduction targets by 2030. The request for offer seeks grid-charged long duration storage technologies with a minimum 50 megawatts of power capacity and of eight hours of discharge duration.

California regulators have estimated that the state will need 1 gigawatt of long duration storage by 2026. However, the lithium-ion batteries now being deployed at grid-scale typically deliver full power for only four hours or less. The Joint CCA's request for offers is unique in that it requests storage technology with an eight-hour capacity. The Joint CCAs confirmed that many companies responded to a prior solicitation on the same topic earlier this year. Potential technologies identified in the requests for information include conventional lithium-ion and chemical flow batteries, compressed air, pumped hydro and emerging technologies such as thermal and gravity-based storage.

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