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ARIZONA OUTLINES PLAN FOR CARBON-FREE POWER BY 2050

Arizona regulators outlined recently a plan to achieve 100 percent carbon-free power by 2050. Current policy requires that 15 percent of electricity generated in the state must be produced from renewable resources by 2025. On 5 November, the [Arizona Corporation Commission](#) (ACC) proposed a plan to provide increased targets for local investor owned utilities: [Arizona Public Service](#) and [Tucson Electric Power](#). Under the new plan, these utilities must reduce carbon emissions by 50 percent by 2032 and 75 percent by 2040. The ACC's new plan would also require these utilities to use a mix of resources to achieve carbon reduction goals. For instance, energy storage systems would be required to constitute five percent of the state's resource mix by 2035 and 40 percent of those storage systems would need to be customer-owned or leased.

If confirmed by a final vote, Arizona would join eight other states who have similarly committed to reach 100 percent renewable energy generation or cut carbon output to zero by 2050 (although, unlike many states, the 100% goal would be established through an administrative agency, rather than by statute or executive order). Moreover, the changes would be the first significant change to Arizona's clean energy standards since 2006.

FERC ISSUES NPR TO UPDATE QF DEFINITION OF COGENERATION FACILITIES

On 15 October 2020, the [Federal Energy Regulatory Commission](#) (FERC) issued a Notice of Proposed Rulemaking (NPR) to update the definition of “useful thermal energy output” in the regulations implementing the Public Utility Regulatory Policies Act of 1978 (PURPA) (18 C.F.R. Part 292) in light of recent innovations by cogeneration facilities, particularly Solid Oxide Fuel Cell (SOFC) systems. As a result, the proposed changes may reduce regulatory burdens for certain qualifying technologies.

The NPR would amend the definition of “useful thermal energy output” for a topping cycle cogeneration facility by adding thermal energy that an SOFC system utilizes with an integrated steam hydrocarbon reformation process to produce fuel for generating electricity. The purpose of the change is to clarify that such thermal energy from a SOFC, then used to reform methane and create hydrogen to generate electricity, would enable a facility, powered by SOFCs, to be eligible for certification as a cogeneration qualifying facilities (QF). In accordance with PURPA, FERC may certify certain small power production and cogeneration facilities as qualifying facilities (QF). Such certified facilities are exempt from certain requirements of the Federal Power Act and Public Utility Holding Company Act of 2005.

FERC clarified that the NPR applies exclusively to SOFC systems “with integrated natural gas reformation that take in natural gas to produce hydrogen and to generate electricity by using steam from the power generation

process to reform the natural gas to produce the hydrogen that the [SOFC] systems use to generate electricity.” Comments on the NOPR are due in FERC Docket Nos. RM21-2-000 and RM20-20-000 on 25 November 2020.

TRANSPARENT SOLAR CELLS MAY CREATE NEW VENUES FOR SOLAR GENERATION

[Researchers](#) at [Incheon National University](#) have broken new ground by developing a transparent version of a traditional photovoltaic solar cell. The researchers developed the design for a metal-oxide-based device by inserting an ultra-thin layer of silicon between two transparent metal-oxide semiconductors. The new design has several advantages: it allows utilization of longer-wavelength light, it results in efficient photon collection, and it allows for the faster transport of charged particles to the electrodes.

The transparent photovoltaic cell has many unique potential applications, such as integration into windows, vehicles, cellphone screens, and other everyday products. The innovation reflects a larger trend towards more “personalized energy” solutions that can be integrated into everyday products. The researchers at Incheon National University anticipate further refining their invention by using innovative materials such as 2D semiconductors, nanocrystals or metal oxides, and sulfide semiconductors, with the goal of making personalized energy solutions a reality.

BIOLOGICAL BATTERIES COULD TAKE THE SPOTLIGHT FROM SOLAR AND WIND

[Bioo Arkyne Technologies](#) has [committed](#) to bringing to market batteries that generate and store energy from soil by the end of 2021 or early 2022. Bioo, a Spanish tech startup based out of Barcelona, is focused on developing electricity generation through nature.

Bioo places batteries underground so when it rains, nutrients and microorganisms leach into the biological battery. The microorganisms then feed on organic matter and produce protons that are disbursed to the cathode and electrons that are disbursed to the anode. Air that comes through the panel's holes gives oxygen to this process, fueling a current that can power light, sensors, and, if ultimately applied at a larger scale, a house or commercial building.

This technology could be used by farmers and the agribusiness industry by applying it to their fleet of sensors to—among other things—measure the amount of carbon stored in soil (a developing asset as farmers take aim at restorative agriculture methods to earn carbon credits).

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