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Like many utilities, the Omaha Public Power District has a net-zero goal by 2050 -- something that it expects to achieve by increasing the use of green energy. And like all power companies, Omaha"s plan includes the use of flexible energy sources that can kick on when the sun stops shining.

Everyone already knows that wind and solar energy are intermittent fuels. They must be firmed up by energy storage or fast-starting generation that ideally is also carbon-free. Most often, natural gas is used as the safety net. But the makers of electric power generators are now creating multi-purpose engines and turbines that are future-proofed and that are also able to run, for example, on hydrogen.

"To build a sustainable future, we need to decarbonize step-by-step," says H?kan Agnevall, chief executive of W?rtsil? Corporation, in a Zoom conversation with this writer from his office in Finland. "Some of the major solutions will be wind and solar. But they have challenges. So you then need "balancing power."

"There are different technologies: pistons and battery storage are two of the major solutions," adds Agnevall. "The great thing is that they are flexible and can quickly ramp up and down. They perfectly fit with intermittent sources and they can also be flexible in terms of what types of fuels they use. In two minutes you can ramp up 10 megawatts. This is fast."

Today, for example, W?rtsil?"s engines can incorporate as much as 25% hydrogen that is blended with natural gas. But the company is working hard to ensure that those engines can operate completely on hydrogen -- and ideally "green hydrogen" that is produced from clean energy sources. The engines will be "future-proofed," meaning that utilities would not have stranded assets a decade from now. General Electric, Siemens, and Mitsubishi Heavy Electricals are among the other manufacturers of power generation equipment.

As for the Omaha Public Power District, its backup generation is a 156-megawatt multi-fuel engine power plant. It will grow that facility with 400-600 megawatts of utility-scale solar generation that connects to the grid. It will be supplied by W?rtsil?, as well as Siemens. Already, W?rtsil? has installed a total of 74,000 megawatts of power plant capacity in 180 countries. It has also installed 80 energy storage systems around the globe.

How big is the market for flexible power -- fuels that can firm up intermittent sources? Across the most developed countries in the world known as the G20, more than 3,500,000 megawatts of such flexibility is needed to get to 100% renewable energy, says W?rtsil?"s Atlas of 100% Renewable Energy. That includes 933,000 megawatts of flexible natural gas power capacity.

At the same time, W?rtsil? is providing advanced energy storage services. It just installed 200 megawatts of

such capacity in Texas: the Madero and Ignacio energy storage plants, for example, will support the Electric Reliability Council of Texas, which orders up generation sources and operates the grid for much of the state. The systems are expected to be fully operational in January 2022.

"Battery storage is growing rapidly in the United States, Australia, and Asia," says W?rtsil?"s Agnevall. "It provides shorter support -- between four to eight hours. We use lithium-ion batteries. They provide real value: if you have this power available, it can be sold to other buyers when demand is high. The combustion engines used as backup are for the long-term swings."

Meantime, those economies of scale are building: Tesla Inc.is investing $5 billion in a battery storage manufacturing facility while Xcel Energyhas received hundreds of bids to help it integrate energy storage into its wind and solar energy networks. It shows that battery technology is becoming competitive with conventional generation and that those prices, generally, are falling.

To boot, the Federal Energy Regulatory Commission issued an order in 2018 that allowsstorage resources to participate in wholesale markets-- where electricity is bought directly from generators before selling that power to homes and businesses. Under the ruling, storage operators are paid the same as traditional power suppliers. Afederal appeals courthas upheld the commission"s order.

"We understand their variability," referring to wind and solar energy, says Elliot Mainzer, chief executive of the California ISO, which is the state"s grid operator that orders up electricity supplies and then distributes those electrons. "We are good at planning and procurement and you can get ahead of that curve ... The strategy is to bring on clean energy and clean dispatch-able capacity to displace (natural gas) generation."