Energy storage for demand response st john s

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REstore wants to help solve that problem through technology that can analyze, predict and adjust power-using devices to balance out those minute-by-minute or hour-by-hour fluctuations. The Antwerp, Belgium-based startup is managing a “couple of megawatts” of load right now in Belgium, Luxembourg, The Netherlands and the U.K., Jan-Willem Rombouts, a co-founder of the startup, said in an interview this week.

Most of that is in cold storage facilities in the Benelux area, which serves as Europe’s biggest logistics hub. But REstore also controls plug-in vehicles, with about 175 cars in a Belgian pilot that started last summer. This week, it launched a new project with French utility EDF that’s going to hook up about 150 plug-in electric vehicles in an automated vehicle-to-grid (V2G) load-balancing system.

Balancing the ups and downs of wind and solar generation requires technology that can turn down power loads at a moment’s notice, usually at the order of a technician manning some grid operations command center that needs to keep the power in perfect balance at all times to avoid blackouts.

That’s a prerequisite for playing in this market, but REstore isn’t the only one doing it -- companies like EnerNOC, Viridity Energy, Honeywell, Siemens, BuildingIQ, Powerit Solutions, Enbala and others are doing fast, automated demand response of this kind in the U.S., Europe and Asia.

What differentiates REstore’s technology, called Flexpond, is its attention to the pricing side of the power equation, Rombouts said. As a former trading strategy and risk management software developer for Goldman Sachs, he looked at the energy market and saw a lot of room for improvement.

“Compared to mature markets in finance, like credit markets and interest rate product markets, in the energy market, we see an immaturity,” he said. “Demand is not really tuned well to supply in the market, and you see that in the pricing.”

For most of their history, electricity utilities have relied on huge central generation plants to provide plenty of stable “baseload” power, but intermittent wind and solar power challenge the system -- particularly when, like rooftop solar panels, the utility can’t even see how much power they’re producing, let alone control it.

REstore co-founder Pieter-Jan Mermans, who shares “co-CEO” tasks with Rombouts, saw firsthand the problems that Europe’s solar and wind power buildout has created for its grid operators in his decade or so as an energy and utilities consultant with Arthur D. Little. It’s not just that these weather-driven resources can stop producing all at once, he noted. Sometimes they can produce too much power.

Right now, grid operators use natural gas-fired peaker plants, which can spin up and down in 5 to 10 minutes. But power load can be adjusted in seconds, and perform some of the same grid-balancing functions, at much lower cost. Not only that, but they can reduce emissions while doing so. But they have to be as reliable as a peaker plant, or the grid won’t want them, he said.

Plug-in cars are a particularly “stochastically coupled” (i.e., really hard to predict) set of resources, Rombouts said. First of all, you never know how many are plugged in at any time, and secondly, you don’t know how many owners might disable their cars from being used as grid resources.

It’s important to note that REstore isn’t actually tapping the car batteries for power. That could weaken the batteries and mess with warranties. Instead, it adjusts the level of charging, using a technology called pulse width modulation (PWM), which allows power to go up and down gradually, versus all at once, which can harm the battery.

PWM is part of the IEC 61851 set of standards for car charging, and REstore is charging Nissan Leafs, Renault, and the Opal Ampera, Europe’s version of the Chevy Volt, in its charging projects, Rombouts said.