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San Diego Leading Change to Energy Smart City Heading into 2014

CLEAN TECH: Finding Ways to Store Renewable Energy Among Challenges

■ By MEGHANA KESHAVAN

The biggest economic trend in clean technology in San Diego is its impending metamorphosis into a "smart city," said **Holly Smithson**, president of clean energy trade group CleanTech San Diego. City planners are using software to make better energy-use decisions, interweaving a shift to green energy technology from wind power and biofuels to power cities that are more conscientious about their energy usage.

Holly Smithson

"I think what we're doing in San Diego today is what cities need next," Smithson said. "For San Diego and for a lot of major cities around the globe, there's a concerted effort to convert these cities into intelligent cities."

Most relevant is downtown San Diego's new pilot program with **San Diego Gas & Electric** — and possibly **Qualcomm Inc.** (Nasdaq: QCOM) — to build a "smart grid" streetlight infrastructure that will involve installing energy-efficient LED lighting to be coupled with wireless hubs that could have a variety of cost-saving and revenue-generating applications.

Central to the cost-savings plan is the addition of metering to each additional streetlight. The pilot will connect all the downtown streetlights in a metered grid such that each light can be evaluated remotely for energy usage — or whether a light is working.

Creating a 'Dynamic Profit Center'

Beyond that, electronic vehicle charging stations, for instance, could be linked to these streetlights — as could chemical sensors, video cameras for enhanced homeland security, Wi-Fi hotspots and cellphone "microcells" that could boost bandwidth.

"Instead of just being a static cost center, cities can now have a dynamic profit center," Smithson said. "We're starting to be more intelligent about the way that we manage our energy access, and we're starting to be more intelligent in the way we offer energy services."

Cities such as Vienna and Barcelona are experimenting in this space, but San Diego is America's first to attempt a full-blown transformation into a smart city. For those cities that are attracting businesses and talent, they have to deliver services reliably and without fail, Smithson said.

"And so as we move into that era, the key component to successfully capturing new business is the ability to be the most intelligent and smart city," Smithson said. "And I think there's a lot of complementary technologies — like the shift to biofuels and the growth of home energy monitoring systems — that will support the movement toward these smart cities."

This can also be seen on a more microeconomic level, such as in San Diego companies like **Rogov Design Inc.** and **Green Edge Technologies Inc.**, which are developing devices that help homeowners modulate their energy expenditure and alert them when their energy use starts to rise. Energy usage can be monitored at a granular level, down to an individual outlet or microwave oven, enabling homeowners to make careful decisions that will impact their carbon footprint — and their bills.

Biofuels Boom and 'Storage Wars'

Energy trends are interlinked, as more and more businesses, public entities and even the military begin adopting biofuels and other clean energy technologies, Smithson said. This will continue in 2014 and further, she said.

For instance, the U.S. Navy recently announced it will begin buying biofuels in bulk, and businesses nationwide — including San Diego's **General Atomics**, **Sapphire Energy Inc.** and **SG Biofuels** — are developing such fuels out of plants or algae. The Navy is experimenting with powering jet aircrafts and ships with these fuels, and said that by mid-2015 expects biofuel blends to become part of regular fuel purchases.

Smithson said that the next wave of problem solving in the clean energy space will be figuring out ways to store energy — now that solar power and even biofuels are beginning to proliferate and cities are becoming more adept at harnessing this technology.

Researchers are studying ways to store wind, solar and geothermal energies that can only be gathered under certain conditions or at certain times of day — an issue that Smithson said many of San Diego's clean tech companies are centering around.

"We're entering the decade of the storage wars," she said. "But in San Diego, we're playing a longer game that will hopefully play to our advantage."

It's game that may last several years.

"So much of the process is about changing behavior, not just retrofitting a streetlight or installing solar power into a building," she said. "It's a process, and it takes time."