Congress Considers Cow Power, Other Alternative Energy Technologies

June 1 2010, By Phil Schewe and Devin Powell

According to the estimates from one company, four dairy cows could produce enough energy to power a small apartment.

(PhysOrg.com) -- Legislators attending this year's Congressional Energy and Energy Efficiency Expo and Forum in Washington, DC, last week were quick to point out the problems with fossil fuel -- from cave-ins at coal mines to the oil spill in the Gulf.

"We've never been injured by a photon spill," said Rep. Jay Inslee of Washington State, referring to the virtues of solar energy.

The expo featured a roomful of vendors selling technologies based on renewable sources and energy efficiency, as well as a dozen or so members of Congress from both parties and representatives of the

executive branch who support these types of alternative energy ventures.

"The road to energy independence begins in South Carolina," said South Carolina Rep. Bob Inglis, who proudly recited a list of the energy companies in his state. He argued that the "externalities," the sometimes-overlooked hidden and indirect costs of various energy-production methods, had to be considered in order to let the marketplace operate efficiently and "to deliver us from the bondage of oil."

Maryland Chris Van Hollen underscored the principal aims of energy-climate legislation: enhancing national security by reducing dependence on oil imports, protecting the environment, and helping to create new jobs and rebuild the economy by encouraging innovative, green companies.

Van Hollen is a co-chair of the House Renewable and Energy Efficiency Caucus, a group in the House of Representatives interested in renewable energy. The complexity of the green energy enterprise can be seen in the roster of other mostly bipartisan caucuses represented at the expo, which included those devoted to sustainable energy and environment, high performance buildings, energy from algae, hydropower, green jobs, hydrogen and fuel cells, and even green schools.

Solar and wind energy companies displayed their latest designs -- from roof shingles with built-in photovoltaic cells to new wind turbines that look like giant flywheels. Manufacturers of light-emitting diodes, or LEDS -- which light the office of Maryland Rep. Roscoe Barlett -- hawked bulbs that use 60 percent less energy than fluorescent bulbs, which are in turn much more efficient than traditional incandescent bulbs.

Sprinkled in among the headlining technologies represented at the expo were small companies with ideas you may never have heard of,

technologies that have found their way into niche markets and that are described below. As congressional staffers questioned the representatives from these companies, cost was one of the primary concerns. Again and again, the salespeople made the same pitch: their technologies, which tend to be more expensive up front, would pay for themselves in the long run.

Cow-o-Watts On The Farm

How many dairy cows does it take to make a kilowatt of electricity, enough to power a small apartment? Four, according to GHD, Inc. The company, based in Chilton, Wis., makes methane from cow poop using a technique called anaerobic digestion. Four cows make about 64 gallons of manure a day. This manure can be fed to bacteria that once lived in a cow's gut. These microorganisms break down undigested fatty acids in the manure over weeks to make methane gas. Methane is then burned onsite at the farm to make electricity that can be sold to utility companies. To be economical the operation needs about 600 cows, and the largest operations include more than 10,000 cows.

Tiny Hydropower In Irrigation Canals

In the 1930s, engineers tapped the mighty flow of the Colorado River with the Hoover Dam, which sends water over a 500 foot drop to provide power for 1.3 million people. A new hydropower device on display was inspired by such dams but works on a much smaller scale. It is designed to tap the irrigation canals that carry water from the Colorado River hundreds of miles to keep the lawns in places like Phoenix, Ariz. green year-round.

How does it work? Natel Energy, Inc. of Alameda, Calif. has designed a way to harvest the energy from the fall of water in short (10-20 foot)

drops along the canals as the water flows. This process, borrowing from the design of airplane wings, has been installed in Buckeye, Ariz., where it captures 87 percent of the water's energy and produces enough energy to power five homes.

Viewing The World Through Tinted Glass

At Century College in St. Paul, Minnesota, the windows of the university's library can change from transparent to tinted with the push of a button. The glass, manufactured by SageGlass in Faribault, is meant to improve energy efficiency. When tinted, the glass reflects sunlight away to keep the interior cool. When transparent, it allows heat in on cool days.

The windows, which cost 2-5 times more than a standard window, are made of ordinary glass coated with very thin ceramic materials that darken when exposed to an electrical current.

Forklifts That Run On Hydrogen

When you think of forklifts, you probably don't think high tech. But forklifts have become one of the first emerging markets for hydrogen fuel in the United States, according to Geoffrey Bromaghim of the National Hydrogen Association. Forklifts, which require significant energy to lift heavy boxes, often run on large lead-acid batteries that take time to recharge and can produce toxic fumes.

Hydrogen fuel cells, which produce electricity from hydrogen, are more expensive but recharge faster and reduce the labor costs of changing batteries, said Bromaghim. The market is still small, though -- out of the 28,000 forklifts operating the U.S., only 200 run on hydrogen fuel cells.

Back To Basics

Rep. Vern Ehlers of Missori, a former nuclear physicist and the son of a preacher, celebrated the technologies on display. But he also delivered what he described as a sermon, asking those in attendance to start with even simpler money-saving ways to improve energy efficiency. Living in a cold place, he said, made him appreciate insulation. He invested in halting the heat leaks in his own home and was rewarded immediately when his next energy bill dropped by 30 percent.

Provided by Inside Science News Service