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COLUMN FOR IMMEDIATE RELEASE

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The Road Map to a Hydrogen Economy

By Al Cotter, Retired 3M Engineer – Hutchinson, MN

President Bush has said it; California Governor Arnold Swarzenegger has said it; Thomas Friedman, a New York Times columnist and author, has said it -- the future to clean energy will be hydrogen. After attending a renewable energy seminar at the University of Minnesota Morris, I believe it. I learned that Minnesota is developing technologies and putting those technologies into production.

Ethanol from corn was the starting point. Today Minnesota has 15 ethanol plants in production and more are being built. Other plants have expansion plans. All are improving efficiency to reduce the need for outside energy, such as natural gas and electricity. A few plants are working toward running totally on renewable energy.

The University of Minnesota's Lanny Schmidt invented a process that efficiently removes the hydrogen while making ethanol. Because ethanol has water in it during production, his process removes hydrogen from the water. In addition, corn stover or other biomass can be delivered to ethanol plants and gasified into methane, replacing natural gas. We no longer have just ethanol plants, they are bio-factories.

With the addition of a wind farm in close proximity to this bio-factory, the plant has a renewable source of electrical energy. Since this wind farm would be part of the area-wide electrical distribution, less than ten percent additional capacity is needed for calm days. This ten percent electrical energy could be supplied by fuel cells using hydrogen made at the bio-factory. Hydrogen could also be used to make nitrogen fertilizer for corn.

Wind systems often generate excess electrical energy. At the University of Minnesota Morris's wind generator, scientists are developing a system, using the excess electricity to make hydrogen from water. This hydrogen will later be used for electrical generation with a fuel cell.

The foundation for a hydrogen economy includes local farmers and businesses owning the wind farms and ethanol plants in rural Minnesota.

Car manufacturers are developing cars that will travel close to a hundred miles per gallon using hydrogen-powered fuel cells. Other automotive developments include flexible fuel vehicles that run on gasoline, E85 or hydrogen, providing a ramp on the hydrogen highway.

Stationary fuel cells are also being developed that power a home or small business, with excess power being sold back to the electrical company. One cannot read an article on fuel cell development without 3M being mentioned as supplier of fuel cell components. The road to making Minnesota energy independent with hydrogen will benefit all of Minnesota.

Where do we go from here on the road to a hydrogen-based economy? A roadmap tells us we must continue to invest in wind energy and bio motor fuels -- ethanol and bio-

diesel. We must support technology development at our colleges and universities, educate researchers and provide training for personnel to run the bio-factories.

How soon can Minnesota become energy independent? If you ask citizens who want a reliable supply of energy, they will say “soon.” If you ask a person who thinks that we are experiencing global warming, they will say “sooner.” Progress on the road to a hydrogen economy will require involvement by many people in Minnesota. There are many ways to be involved. For example, I have been involved in Minnesota Corn Growers and Minnesota Soybean Growers, and I’m now working with the local Chamber of Commerce, the Southwest Minnesota Foundation, and a county group called Proactive Energy Action Committee (PREAC) to educate and help promote the renewable energy industry.

Last year the State of Minnesota passed a bill to increase the ethanol content in gasoline to 20 percent. This year, a bill, HF1798, will require utilities to meet certain renewable electrical energy usage standards. We need this bill passed. Working with groups that support renewable energy will accelerate us on the highway to a hydrogen economy, giving us an expanded job market, greater wealth and cleaner air for all Minnesotans.

This monthly column is brought to you by the Southwest Minnesota Foundation as part of its initiative to advance renewable energy as an economic asset in southwest Minnesota by branding and promoting the region as The Renewable Energy Marketplace™. For more information on the Renewable Energy Marketplace™, log onto www.renewableenergymarketplace.org and for more information on the Southwest Minnesota Foundation, log onto www.swmnfoundation.org.

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