

# WISCONSIN Renewable Quarterly



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## Renewables to Power Doyle's Energy Agenda

**I**n his first policy address on energy since taking office, Governor Jim Doyle unveiled an ambitious target for renewable power development and vowed to bring back coordinated utility planning in Wisconsin.

Speaking to a Milwaukee business group on April 11, Doyle challenged utilities to "increase the percentage of renewables you use to serve your load to 10 percent in 10 years." The current requirement -- called a Renewable Portfolio Standard (RPS) -- mandates that utilities must generate 2.2 percent of their energy from renewable sources by 2011. The Governor's declaration adds considerable weight to **RENEW's** ongoing efforts to mix renewable power sources into utility generation plans and leverage locally financed and developed windpower in eastern Wisconsin.

Some energy observers praised the higher renewables goal, but cautioned that achieving it would be a stretch. Currently, of the state's major electric utilities, only We Energies is committed to a higher target than what the law mandates. Last year the Milwaukee-based utility set a goal of deriving 5 percent of its total load from renewable electricity sources by

2011.

### Wagons Circle Around Focus

Doyle also drew a line in the sand on further budget cuts to Focus on Energy (Focus), the ratepayer-funded program that supports energy efficiency investments and customer-sited renewable energy systems in Wisconsin. His biennial budget proposes transferring \$27 million of Focus program revenues to the general treasury. This transfer, if approved by the Legislature, would reduce the biennial budget of Focus from \$124 million to \$97 million, a cut of more than 20%.

### Governor James Doyle:

*"[Some] may argue for drastic cuts in, or even repealing, our Focus on Energy program, I say to you now -- loudly and clearly -- that I reject those efforts."*

While **RENEW** has been critical of the proposed \$27 million transfer from Focus to general revenues, Doyle's budget is likely to inflict less punishment than the version put forward by the Legislature. Many in the Legislature favor deeper cuts to Focus' budget, though the sentiment is not universally held. One notable

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dissenter to the "Drain Focus Dry" viewpoint is Sen. Robert Cowles, who chairs the Senate Energy and Utilities Committee. Writing in Madison's *Wisconsin State Journal*, Cowles championed Focus as a "program that fuels economic development and is good for the environment," and argued against siphoning off Focus revenues to plug the holes in the state's finances. (The complete text of Cowles' column is posted at [www.renewwisconsin.org](http://www.renewwisconsin.org).)

Acknowledging that some legislators "may argue for drastic cuts in, or even repealing, our Focus on Energy program, I say to you now -- loudly and clearly -- that I reject those efforts," Doyle told the audience at the Sixth Annual Energy Symposium of the Metropolitan Milwaukee Association of Commerce.

In defense of Focus, Doyle said, "You just can't have a responsible energy policy without investing in

*(Continued on page 5)*

## Congress Teases Wind Industry with Move to Extend Tax Credit

From SolarAccess.com - A provision to extend the Production Tax Credit (PTC) for one year was dropped from the final form of the US\$350 billion tax-and-spending package - just approved by both Houses of Congress. The short-term PTC extension was contained in an earlier

Senate version of the bill, according to the American Wind Energy Association (AWEA)

Just two days before AWEA's national wind power trade show kicked off in Texas on May 18, the one-year extension was passed by the Senate, sending ripples of antici-

tion throughout the industry. The current value of the credit is US1.8 cents/kWh of power produced.

"We're confident that we're going to get this credit extended," said AWEA's Legislative Director, Jamie Steve. "This is not an enormous setback." ®

# Questions Abound on Costs and Timing of New Coal Plants at Oak Creek

by Michael Vickerman, RENEW Wisconsin

**A** preliminary review of Wisconsin Energy's Power the Future plan suggests that only one of the utility's proposed three coal-fired generating units is needed to satisfy anticipated load growth by 2011.

The analysis contained in the Draft Environmental Impact Statement (DEIS), issued in late April, indicates that a combination of wind turbines at relatively windy sites, a lesser amount of coal-fired capacity, and gas-fired combustion turbines would achieve greater savings than Wisconsin Energy's preferred approach of building 1,800 megawatts (MW) of coal generation in Oak Creek.

*If all three coal-fired units are permitted and built under a lease financing approach, their total cost would exceed \$4 billion.*

## The Proposal, Summarized

Under Power the Future, Wisconsin Energy (WE) would add one 600 MW generator in 2007, another in 2009, and the third in 2013. All three units would be built next to 1,200 MW of existing coal-fired generation built in the 1960s. Two of the three proposed units would use pulverized coal combustion technology, while a third unit would gasify coal and run it through a combined cycle plant.

This proposal departs significantly from utility tradition in that an unregulated subsidiary of WE would construct and own the coal units, and lease them to the regulated subsidiary, now called We Energies. Part of the capacity would be reserved for other Wisconsin utilities, including

MG&E and Wisconsin Public Power, Inc. The leased generation approach favored by WE would generate a larger return to shareholders than would the same power station if owned by the regulated utility. If these coal plants were built and owned by a regulated utility, their overall cost over a 30-year period would be, according to PSC estimates, 14% less on a present value basis than using a lease financing approach.

## Modeling Results

Using a capacity expansion program (EGEAS) that factors in a range of economic assumptions and generation sources, Public Service Commission staff modeled four different cases and compared their costs and timing of implementation. One of the scenarios envisioned substituting Calpine's 523 MW gas-fired generation station near Fond du Lac for the proposed coal-fired units. From the modeling the PSC staff reached several conclusions:

- Windpower (Class 4, 15.7 to  
(Continued on page 5)

## Conference Blends Education, Religion, Environment and Power Generation

by Dennis Briley, RENEW board member

**M**oral Choices for Powering Our Future, a conference held in Brookfield April 12, enlightened 90 attendees about the electrical efficiency/power generation options for southeast Wisconsin. Speakers addressed efficiency, coal-fired generation, natural gas generation, renewable energy options, and the hydrogen economy. These options were then filtered through a religious/ethical perspective. Participants seemed to be energized by the opportunity for thoughtful discussion in addition to the facts and perspectives presented.

Attendees were impressed by the high quality of presentations and the informed discussion that followed. One person commented, "I found [the conference] to be intellectually stimulating and well-balanced in the range of speakers offered. Hopefully we can continue working together on shared missions in the future."

Comprehensive public education on electrical power generation/usage is lacking, as identified in the Wisconsin Environmental Initiative's Energy Report. This conference confirmed the public's interest in energy

planning and use, especially when an effort is made to reveal the linkages between supply and demand, describe fairly the regulatory climate under which construction proposals are advanced, and the complexities associated with different power resources. Regardless of the outcome of We Energies' Power the Future proposal, Wisconsin is entering a significant construction cycle, with new power plants and transmission lines an inescapable part of our future. Engaging the public beyond those who have already expressed a viewpoint in this subject is where our opportunity lies.

RENEW Wisconsin was one of the sponsoring organizations and Executive Director Michael Vickerman one of the presenters.

Other sponsoring organizations included: Unitarian Universalist Church West; Green Sanctuary Committee; Wisconsin Interfaith Climate and Energy Coalition (formerly Interfaith Climate Change Campaign); Southeast Wisconsin Unitarian Universalist Council; Interfaith Conference of Greater Milwaukee; Wisconsin Environmental Initiative. ®

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RENEW Wisconsin is a non-profit organization advocating the adoption of clean energy strategies to power Wisconsin businesses and households in an environmentally responsible manner. Through a combination of public policy and private sector initiatives, RENEW aims to increase the use of clean, self-renewing energy resources to generate electricity or displace fossil-generated electricity.

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## Digester Value Goes Beyond Power

By Judy Brown, Regional Editor  
Reprinted from *Country Today*

**A**fter 15 months of operation of its manure digester, Gordondale Farms, Inc. adds up all the positives about biogas production on its Portage County dairy.

"The project has gone well," said Kyle Gordon, Nelsonville, who spoke March 27 at the 2nd annual Manure Biogas Symposium.

While he's convinced of the value of the project, he knows there are skeptics off the farm.

Even with \$9 milk, the \$650 per cow investment pays dividends, the fourth generation farmer said. The farm has about 800 cows.

"You have to combine all the benefits," he said.

Besides selling a million kilowatts of electricity to the utility since the digester was put into action, the farm sells 50 tons of bedding a month which is the treated manure sans pathogens, odor and much of the liquid. The farm produces 100 tons of manure a month.

"It's a real number," he said.

Alliant Energy owns the generator and because of that buys back the electricity at a discount.

"We take less for the electricity which made the project come together," Mr. Gordon said.

It costs 30 cents a day per cow to operate the digester at Deere Ridge Dairy.

Even though the farm has produced 1 million kilowatts of electricity, Mr. Gordon said the bankers weren't impressed.

Nor was an appraiser who told the Gordons that they have a "\$250,000 manure pit."

The family's share in the project is \$650,000.

However, Mr. Gordon countered the skeptics with figures illustrating how the system has shaved production costs on the 3,000-acre farm.

He calculates a \$300,000 value including sold bedding, a \$19,000 tax

credit, the sale of electricity, a savings of \$5 per acre in weed control, and a savings of \$20,000 in purchased fertilizer.

In addition, excess heat recovered from the electricity generation process cuts down on heating bills in the dairy.

"It saves a ton of propane," Mr. Gordon said. The heat goes to the milking parlor and the return cattle lanes.

"It really has worked well," he said.

Even though Mr. Gordon favored sand in the freestalls, he supports the used of treated manure for cow bedding. He said the cows "are very healthy" with the somatic cell count of the herd at 225,000, which is lower than in the old dairy barn.

"It's more management than bedding, and we're getting an 85 percent reduction in e-coli," he said. "Cows are knee deep in it all the time. They are very comfortable."

Bacteria in the digester significantly reduces odor-causing compounds in the manure.

"It allows a 500-cow dairy to co-exist with urban development," Mr. Gordon said. "I believe it's a critical link between production agriculture and sustainable agriculture. The two can go together."

Maple Leaf Farms, Franksville, found a manure digester useful in dealing with regulatory complaints at the large duck farm in Racine County.

"The main reason was for odor control and manure management," said Robert Rosdil, corporate manager regulatory compliance.

The system installed in 1988 doesn't resemble the system operating today, he said.

"We're getting very good percentage of methane," he said. "Our gas quality is excellent."

Asked whether the day will come when every livestock farm has to have a digester, Mr. Rosdil said "if you are large enough."

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## Renewables Producer Profile

# Virent Energy: Tapping Into the Power of Sugar Water

**S**ince its inception in March 2002, Focus on Energy's Renewable Energy Program has awarded about \$1.5 million in grants and incentives, largely to promote customer adoption and use of renewable electricity. A portion of these moneys, however, is targeted toward businesses that are investigating new processes and services involving renewable electricity. Eligible businesses can seek cost-sharing dollars from Focus for business plan development, marketing and promotional materials, feasibility studies, and technology research and development.

Beginning with this issue, the *Quarterly* will profile companies that have staked a claim in the renewable energy marketplace either as a provider of services or a producer of goods. With a helping hand from Focus, these promising businesses have a reasonable chance of becoming efficient and innovative market actors, offering products and services of value to customers in Wisconsin and elsewhere. Once they are established as viable businesses, generating jobs and income growth, these companies will push our state in the direction of energy sustainability.

In the inaugural installment of this series, we talked to Dr. Mark Daugherty, chief executive officer of Virent Energy Systems, a Madison-based start-up company in a renovated manufacturing facility once owned by Giddings and Lewis. Incorporated in 2002, Virent holds an exclusive license to several pending patents on a reforming process that efficiently separates pure hydrogen from a renewable sugar stream or waste stream like cheese whey. Through its grant programs, Focus has provided funding to help Virent prove this process and demonstrate its commercial potential.

Before joining Virent Energy Sys-

tems, Mark was VP and General Manager for Enable Fuel Cell Corporation in Middleton, WI. Prior to Enable Fuel Cell he was a Principal Investigator at Los Alamos National Laboratory. He received his Ph.D. in Mechanical Engineering from the University of Wisconsin - Madison and his J.D. from the University of California at Berkeley, Boalt School of Law.

### **Q.** *What's Virent all about?*

Virent was formed in 2002 as a limited liability corporation to find viable applications for an Aqueous-Phase Carbohydrate Reforming process – ACR process, for short – which produces hydrogen that can be fed into fuel cells or burned to generate electricity.

In lay terms, the process takes an organic product in a liquid solution (that's the aqueous-phase part) and reforms or transforms the carbohydrates in the organic product into hydrogen – in a single step

Virent grew out of discoveries made in 2001 by Dr. Randy Cortright and Professor James Dumesic, working at the University of Wisconsin-Madison Chemical Engineering Department. They discovered how to reform the organics in one step from liquid solutions to hydrogen.

### **Q.** *So, is the ACR process a better mousetrap for producing electricity from wastes?*

Yes, it is. Like several other processes, such as anaerobic digestion, the ACR process can take organic products and wastes and produce electricity. That's a plus for any of these processes right there. Unlike the other processes, however, the ACR process has a number of advantages – high efficiency, a single reforming step, compactness, constant

flow and very little carbon monoxide (CO).

The process efficiency is very good. It runs at about 200 degrees C, which is quite low for a reforming process. Because of this, heat losses are low compared to higher temperature processes. While the heat source to run the process comes from the hydrogen that is produced from the organic fluid, only about 25% of the hydrogen produced is used in this way, leaving the other 75% available for other purposes, such as generating electricity. Therefore, the process has an efficiency of about 75%.

The ACR process takes only a simple phase separator to remove the hydrogen or other gases from the liquid. The other processes, such as digestion, gasification or steam reforming, require five or six other vessels to achieve the same hydrogen purity that the ACR process can obtain from one vessel. Consequently, the ACR process takes less energy, and the equipment takes up a fraction of the space of any other process.

Constant flow of feedstock compared to a batch flow is also a real advantage. The ACR process can take wastes or other feedstock streams as they're produced and turn them into hydrogen in a matter of minutes, compared to a batch process that must store and hold a large quantity of waste for weeks. The ACR process doesn't need a the large storage tank required by a batch process.

Fuel cells are extremely sensitive to CO; even trace amounts will poison the catalyst. Most hydrogen production processes result in CO formation; in the ACR process the CO is so low out of the initial reactor vessel (as low as 30 parts per million) that additional clean-up of the CO is not required. Competing technologies require several additional vessels

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## Oak Creek Coal Plants

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16.8 mph annual average) is a cost-effective energy source in all four cases. The amount of windpower selected by EGEAS varied from 250 MW to 1,250 MW.

- The third coal unit is not cost-effective under any scenario.

- The optimal in-service dates for We Energies' first two coal units are 2009 and 2014.

- Under most scenarios Calpine's proposed plant, which the PSC approved in April, would be less expensive than the coal additions leased to the utility.

If all three coal-fired units are permitted and built under a lease financing approach, their total cost would exceed \$4 billion. Absent from this total is the cost of expanding the transmission system to accommodate generating capacity additions at Oak Creek. The anticipated cost of such upgrades could reach \$266 million.

### Limits to Economic Modeling

In addition to excluding transmission-related costs, the PSC's modeling runs assume that the future will look very much like the past, especially in the areas of fuel prices and load growth. There are many good reasons to suspect that load growth will slow to trickle in the coming years. The most compelling of these is the diminishing availability of natural gas, which will send prices well above those experienced in the previous decade. The DEIS duly takes note of this disturbing trend in the narrative, stating that "concern is developing about the adequacy of previous predictions and the availability of gas in the future."

However, there is no quantitative assessment of how a doubling of natural gas prices might influence demand for electricity. Nor does the DEIS attempt to quantify how coal prices might increase as suppliers take advantage of rising gas prices.

What gets even trickier to model is the possibility that loads might

actually contract if power costs rise to a level sufficient to cause demand destruction. Adding coal capacity of this magnitude requires huge inflows of capital, which must be paid back through rates. If load growth does not match the approved capacity additions, WE ratepayers will be stuck paying for new plants that are oversized relative to system needs.

However expensive that would be, there is a silver lining to that scenario, and that is it would bring to bear more pressure on WE to retire existing coal-fired units. Recently, WE entered into a consent decree with the Environmental Protection Agency (EPA) that obligates the utility to spend up to \$600 million to reduce air emissions from its generating fleet. Under its agreement with the EPA, WE can either install new pollution control equipment on coal-fired generators or shut them down. Should demand for electricity flatten or decline retiring existing coal-fired capacity will become increasingly attractive.

### A Role for Windpower

Modeling windpower presents some challenges as well. The on-again, off-again nature of the federal production tax credit necessitates two runs to reflect the lower cost of wind generation when the tax credit is in effect versus its higher cost without it. Furthermore, wind energy costs vary depending on resource quality, and not all of Wisconsin's best wind sites are accessible to existing transmission. While there are some borderline Class 4 wind locations in Wisconsin, there is no guarantee that the next 250 MW of wind turbines installed here will be powered by winds of that strength.

WE is on track to acquire 200 MW of wind generating capacity in the next 18 to 24 months. If all goes according to plan, these turbines will be installed and operating several years before the first of the coal-fired units is constructed. Not only is this a substantial commitment to renewable electricity, but one that will con-

tinue regardless of the PSC's decision on WE's coal docket. WE deserves credit for being the only utility in Wisconsin that is committed to substantially increasing its renewable electricity supplies as part of its capacity expansion plans.

*A copy of the 400-page DEIS, including an Executive Summary can be found on the PSC web site at <http://psc.wi.gov/electric/cases/ptf/ElmRd/ind-ptfElm.htm>. The Docket No. is 05-CE-130. Written comments on the DEIS are due June 12. ®*

## Doyle's Energy Agenda

*(continued from page 1)*

conservation."

Doyle ticked off the accomplishments of Focus, which only began in June 2001:

- Saved 144 million kilowatt hours of electricity and 5.9 (sic) therms of natural gas.

- Helped Wisconsin retailers sell over half a million compact fluorescent light bulbs.

- Helped builders construct Energy Star homes.

For every dollar spent, he continued, "we have achieved \$3.50 in energy savings. That's a great return and good investment for Wisconsin."

As a result of Cowles' and Doyle's spirited defense of the program, the prognosis for Focus is improving, although the Governor's original cut will likely stand. It will be difficult to absorb a 20% funding reduction without scaling back participant awards, which will dampen growth of the clean energy market-

*(Continued on page 6)*

### New Members

RENEW welcomes the following new members who joined since the last newsletter:

Bob Gilbertson • Bill Lavelette  
Mary Myers • Steve Nelson • Solar Mining Co. • Josh Stolzenburg  
Virent Energy • Richard Westmore

## Virent: Producer Profile

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to get the CO concentrations down to that level. So we expect the other processes will cost more simply because they have to have multiple catalyst filled vessels to do what we can do in one vessel.

The ACR process uses a catalyst. The reformation takes place when the liquid passes over a catalyst. Depending on the catalyst we select, the process can produce methane or propane or hydrogen. The catalyst looks something like Tic-Tacs. It looks like something you could buy at any drug, grocery or convenience store, but the various catalysts are different mixes of metals and chemicals often including small amounts platinum.

**Q.** *Speaking of feedstocks, what organic products can be fed into the ACR process?*

Anything that contains carbohydrates, especially things like sugar, alcohols and glycerol. The process can use waste products, like cheese whey, paper mill sludge, corn stalks, and manure. Even the hot water used to wash fruits picks up enough carbohydrates that it could be used. There's a lot of waste in brewing and soda production, as well. Brewers have to bottle the beer quickly, and so a little gets slopped around. It goes right down the drain. We could take it and make electricity.

**Q.** *Is beer the first product you expect to process?*

No. We prefer to drink beer. Seriously, we're targeting cheese whey as one of the first products to use on a commercial basis. Whey is as much a problem for cheesemakers as manure is for farmers. The production of a single pound of cheese produces nine pounds of whey, which has some commercially viable uses, but not for all of it. And, whey can't be spread on farm fields as it was in the past. Whey is also ideal because it's

already a liquid. If we were to try to use manure, for example, we'd have to turn it into a liquid. Additionally, whey has a carbohydrate/sugar content that is just right for use in our process.

**Q.** *How much electricity are we talking about?*

That depends on the application. We think that a cheesemaking process based on 8 million pounds of cheese per year can yield 250 kilowatts (kW) of power. In Wisconsin, we think there may be a market for as many as 270 250 kW units. Nationally, there may be enough whey for slightly over 1000 units making 250 kW each, according to our initial

market research.

At the other end of the spectrum on application size, we think this process can be miniaturized enough to fit into a laptop computer and produce the electricity needed to run the computer. A reformer would be part of the laptop, instead of a battery, and you'd have a cartridge full of a sugar water that would be converted to electricity.

**Q.** *How did Virent initially get off the ground?*

After the discoveries, Dr. Cortright and Professor Dumesic worked with WARF (Wisconsin Alumni Research Foundation) to

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## Renewables Power Doyle Agenda

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place.

### Planning: Dirty Word No Longer

Doyle also endorsed an "enhanced" strategic energy planning process, similar to integrated planning abandoned by the Legislature in 1998. The current two-year planning process "offers little or no help to decision makers to consider a longer term vision of fuel diversity, optimal locations for power plants and transmission lines, and the role of renewable energy and conservation."

The chaos created by Wisconsin's piecemeal review process prompted two guest editorials from **RENEW** for the *Wisconsin State Journal*. In a September 2001 column, **RENEW** Executive Director Vickerman observed that "... the institutional capabilities in place in 1997 to plan and shape long-term investments in the state's electric infrastructure no longer exist."

Calling attention to the lengthening queue of generation and transmission projects requiring Public Service Commission approval, Vickerman said that the absence of integrated resource planning invites utility overbuilding.

"Now would be a propitious time

to fix the previous cure and bring back an integrated, publicly accessible planning process for Wisconsin's electric power industry," Vickerman wrote in a column in November 2002.

Doyle justified his proposals by citing load growth, which he said cannot be met through existing power stations and electricity imports. "Total energy usage in Wisconsin is estimated to continue to grow two to three percent per year," he said.

"That is equivalent to building a medium sized power plant every year." But, he continued, "these issues -- building additional generation or transmission -- are not without controversy. . . . [R]eliable power cannot come at the expense of local communities or the environment."

Doyle told the business leaders, "Wisconsin does not currently use a comprehensive energy policy process to help plan for the future."

"It is only through understanding where we are and where we must go that we can say we are doing everything possible to maintain low cost, reliable, environmentally sound energy choices." ®

## Virent: Producer Profile

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secure patents. They asked me to join with them to form Virent in 2002. Once we incorporated a limited liability corporation (LLC), Virent asked for and received \$15,000 from Focus on Energy's Renewable Energy program to conduct a market survey and develop our business plan. The Wisconsin Department of Commerce also granted us \$3,000 to help with the business plan. The survey results were positive, so we applied for additional support from Focus to build a prototype (a small demonstration model.) We received \$20,000 from Focus and built and demonstrated the unit in November and December of 2002. After we completed the demonstration unit, Focus was offering cost-sharing for R&D work involving innovative renewable technologies. Virent responded to the solicitation and was awarded a \$50,000 grant to put together a larger working demonstration of the ACR process.

Focus was critical to Virent's survival in the initial period. Without the support from Focus, Virent wouldn't be nearly as far along, and we might be operating with only two or three people instead of six full-time staff and about that many part-timers.

Focus gave Virent an opportunity to establish credibility as a start-up, as well as to confirm that the ACR process has significant commercial potential. The work done for Focus shows other funding sources that Virent has a track record of performing and meeting deadlines. We now hope to attract seed capital from angel investors and venture capitalists.

Venture capital is always tough to find but alternative energy production in general and hydrogen in particular may be "hot" areas. Venture capitalists want to get in on the ground floor of an industry or process that has enormous potential growth, like telecommunications and cell phones or computers. But those areas are reaching maturity; they aren't going to grow exponentially. Alternative energy production may be one of the new growth industries.

**Q.** *When are we going to see Virent's ACR work in the real world and not as a prototype on a bench in the lab?*

You won't have to wait too long. We expect to have a one kW production system up and running before the end of this year – maybe some time this fall. The next step will be a 50 kW system, and then the full scale 250 kW system. Each would take about a year to develop. Another route could lead us toward smaller 50

watt units to produce hydrogen for laptop computers and Uninterruptible Power Supply applications. We have interest in that type of product from potential funding sources. The funding will determine which route

## Valuing Farm Digesters

(continued from page 3)

He suggested laws would one day mandate the system.

"Once you get it down to a science, it's a pretty simple system," he said.

A study evaluating manure digesters in a seven-state area, including Minnesota and Wisconsin, shows the technology in general is well received, said Joseph Kramer, research associate with Resources Strategies, Inc., Madison.

"There are definitely satisfied owners out there," he said.

However, some digester owners said they would like to receive higher prices for the biogas generated electricity.

"Probably the most frequent negative comment is that it required a change in management," said Mr. Kramer. "Some complained the startup took longer than expected."

Responding to a question, he said there is no hard scientific study underway to put an economic value on odor reduction.

"One way to look at it is avoiding the costs of lawsuits," he said. ®

**YES!** I want to help RENEW increase the use of clean, self-renewing energy resources to generate electricity or replace fossil-generated electricity.

Name \_\_\_\_\_

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# Renewable & Energy Efficiency Events

<p><b>June 20-22</b></p>	<p><b>Midwest Renewable Energy and Sustainable Living Fair.</b> Renew the Earth Institute, Custer. The world's largest renewable energy, energy efficiency, and sustainable living festival. The Fair offers working demonstrations of renewable energy and energy efficiency technologies; products that help households save money, save energy, and protect the environment; workshops and entertainment for children and families; and a friendly festival atmosphere. Over 100 exhibitors, including RENEW. Visit RENEW at Booth 36 in Exhibit Hall A. More information at <a href="http://www.the-mrea.org">www.the-mrea.org</a>.</p>
<p><b>July 15-17</b></p>	<p><b>Farm Technology Days.</b> Clintonville, WI. This technology exposition (formerly called Wisconsin Farm Progress Days) is the largest agricultural show in Wisconsin and one of the largest in the nation. The three-day outdoor event showcases the latest improvements in production agriculture, including many practical applications of recent research findings and technological developments. The Renewable Energy program of Focus on Energy will be an exhibitor at this event.</p>
<p><b>Aug. 9-10</b></p>	<p><b>Illinois RENEWable Energy Fair.</b> Oregon, Illinois. The Fair will provide information on renewable energy sources, energy efficiency, and will build support for incorporating them into daily life. Come and meet the experts and others who are using renewable energy or offering renewable energy products and services. Renewable energy sources can help homeowners, farms, businesses, and communities achieve greater self reliance and a more sustainable energy future. More information at <a href="http://www.illinoisrenew.org/events/fair/ourenergyfair2003.htm">www.illinoisrenew.org/events/fair/ourenergyfair2003.htm</a></p>
<p><b>Sept. 6-7</b></p>	<p><b>Iowa Renewable Energy Expo.</b> Prairiwoods Franciscan Center, Hiawatha, Iowa. Hosted by Iowa Renewable Energy Association. More information at <a href="http://www.irenew.org">http://www.irenew.org</a>.</p>

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