Bright futures:

Reenergizing public power for rural prosperity

Wild Rose dairy farm and manure digester operation, La Farge, Wisconsin

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INTERMOUNTAIN HARVESTING ENERGY NETWORK

Rural prosperity through renewable energy

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INTRODUCTION

In the 1920s and '30s, even as the cities of America brightened with electric light, much of rural America stayed dark as during the pioneer era, dependent on oil lamps and other 19th century technologies. Leaders in rural counties across the nation rose to the challenge and created powerful movements and institutions to bring electrical power to the countryside. These leaders and the rural public power agencies they built brought a new and unprecedented prosperity to rural America and laid much of the groundwork for the immense productivity of modern American agriculture.

Today rural America faces new challenges in many ways as great as those of earlier days. The productivity of agriculture has created its own problems, often pushing farm prices below return rates. A dearth of good-paying jobs in rural areas is making it all but impossible for many young people to stay in the communities their families helped build. The digital divide is growing ,with many rural areas missing out on the broadband telecommunications networks that are as important to this century as highways were to the last one. As a result of these factors and others, the countryside is emptying. Today, one can drive from Canada to Mexico in counties where populations are declining. Many rural counties are shrinking to pioneer-era levels. A new generation of leadership must rise to overcome the challenges now facing rural America, and again energy points the way to answers.

This time the opportunity is for American farms to add a fourth leg to their traditional stool of food, feed and fiber - energy. The institutions that were grown earlier to bring power to rural America have a vital role to play in making American farming a source of clean electrical power for the whole nation. Many agricultural areas, already joining in the biofuels boom, are seeing increased opportunity to become clean electrical power producers. Rural coops can jumpstart agricultural production of clean electricity generated by wind, biogas and solar power by building local markets and enabling customers to also become energy generators. Today, electricity is an expensive input to farming. Tomorrow it will be an output that powers farm operations and rural areas, and provides valuable new revenue streams from urban markets. Public power agencies including coops, public utility districts and municipal utilities are ideally situated to make the vital connections that will transform this vision into reality.

This transformation promises to revitalize rural economies, reduce our nation’s dependence on foreign oil and cut greenhouse gases. With global warming increasingly perceived by Wall Street as well as Main Street as a threat requiring immediate action, public power agencies have an historic opportunity to lead the way to a cleaner future that is gentler on the American landscape -- before regulation is imposed on all utilities.

HOW PUBLIC POWER MADE THE DIFFERENCE FOR RURAL AMERICA

Public power for rural America more than a half century ago made the difference between despair and prosperity for millions of farm families.

Farming was literally back-breaking work in the days before electricity: across rural America, farmers had to manually haul bucket after bucket of water up from deep wells, pitchfork endless piles of hay to feed livestock, and make grain by hand-grinding corn by the hour. Wood had to be chopped and carried, many crops had to be immediately canned. Toilets and showers were all but unknown and many chores had to be finished while stumbling in the dark.

Rural America was the first to experience the Great Depression as crop failures stemming from droughts, poor harvests and low prices in the 1920s plunged farmers into despair. The Depression was “”farm-led and farm-fed’’, and electrifying many of the 5 million farms without electric service helped to lead the way out.

After President Franklin Roosevelt signed an executive order creating the Rural Electrification Administration in 1935, and Congress passed the Rural Electrification Act in 1936, farmer-owned cooperatives organized to actually bring power to rural communities. With just one kilowatt hour, a farmer could milk a cow for 20 days, grind 100 pounds of grain and cut a ton of silage. And coop members were quick to buy appliances to take advantage of the power. In one community, within one year, 84 percent of the coop members had bought an electric iron, and 63 percent bought a washing machine. Main Street started to wake up from the Depression.

Radios were among the most important appliances that rural people bought as soon as the power arrived. They brought weather reports, market information, practical farming advice and access to the Fireside Chats of Roosevelt. Through radios, farm families were brought into full participation in the political life of the day. Young people saw broader horizons and bigger possibilities.

While the federal government’s loan program allowed the lines to be strung, the local ownership of coops and their active members made the program a success. The annual meeting became a high point of the year in rural communities and ensured public participation across rural America. In 1945, the REA distributed a member guide including the question: “Why Go to Annual Meetings?’’ and answered in part, “Because your REA co-op will never be successful unless you and your fellow members are active in it.’’ Grass-roots participation in the REA, as a central force in the community, was critical to the ongoing success of the movement.

Following World War II, the drive to electrify rural America continued. More than a million miles of REA- financed lines were energized by 1950, and more than 75 percent of America’s farms had electricity. Huge public hydroelectric power projects were built and public power cooperatives were given preference in the power sales, allowing them to obtain wholesale power at reasonable rates.

As the fortunes of many rural communities have declined in recent years, the rich heritage of rural electric coops makes them the perfect candidates for leadership in a new era of public power that builds on renewable energy projects located in rural America.[1]

TODAY'S RURAL ECONOMIC CRISIS

Rural America profoundly needs the economic boost promised by building clean energy production. The new economic base built by adding substantial energy production can help overcome deep structural problems that face agriculture-centered regions of Rural America.

Declining Populations - While overall rural population growth rebounded in the 1990s, 10.3% compared to 2.7% in the 1980s, it focused mostly on areas dominated by non-farm activities such as recreation. Rural population decline heavily centered on two agricultural regions, the Great Plains from Montana and the Dakotas to Texas, and the Corn Belt from Illinois west, as "they wrestled with declining agricultural employment and the lack of replacement jobs in other industries," notes the U.S. Department of Agriculture.[2] Those Midwestern farm belts were home to most of the 411 counties that lost population through the decade and the 339 counties that went into the negative column from 1995-2000. Since 2000, the number of counties losing population has crossed the 1,000 mark. One could drive from Mexico to Canada without leaving these depopulating counties. [3]

Notes the *Christian Science Monitor*, "The region is losing so many rural people that 261 Plains counties hold fewer than six residents per square mile (an old census yardstick for 'frontier'). That represents more than one-eighth of the contiguous US – an area larger than France and Germany, but more sparsely populated than any nation on earth. You'd have to travel to places like the North Pole or Greenland to find fewer people per square mile."[4] The frontier declared closed in 1890 by Frederick Jackson Turner is reappearing.

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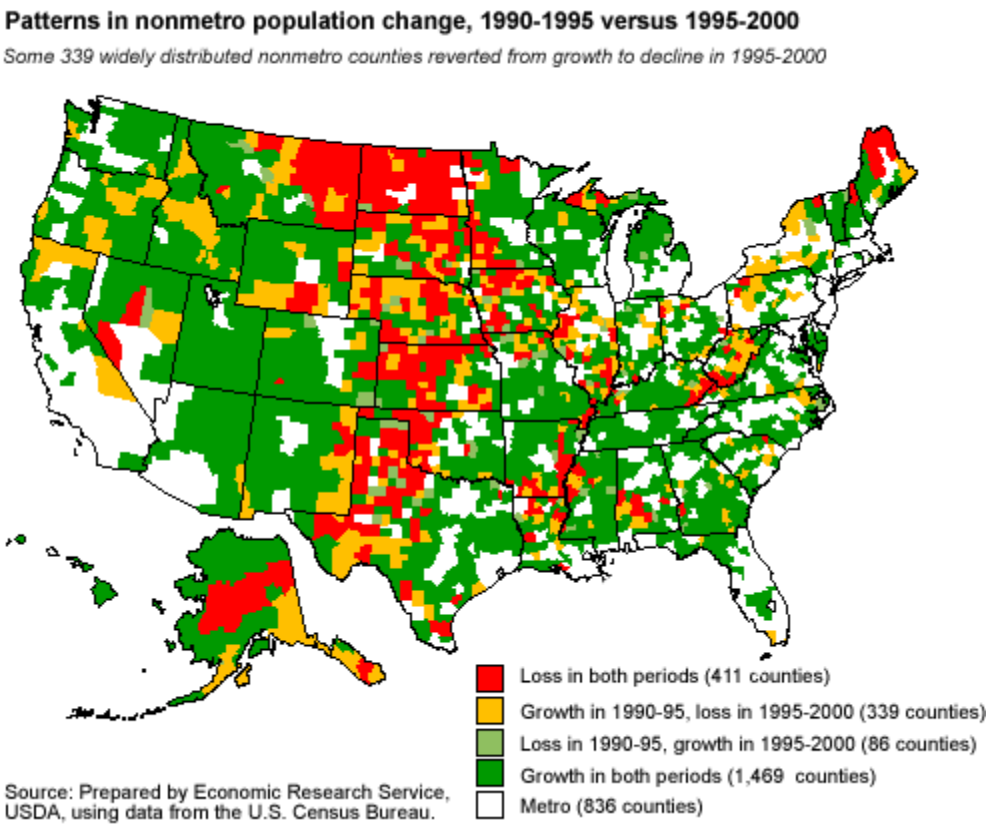
[1] *The Next Greatest Thing: 50 years of Rural Electrification in America*, edited by Richard A. Pence, published by the National Rural Electric Cooperative Association, Washington, D.C., 1984

[2] U.S. Department of Agriculture, Agriculture Fact Book 2000-2001, Chapter 4, p38

[3] http://www.ers.usda.gov/briefing/Population/popchange/

[4] *The Christian Science Monitor, "* The dwindling heartland: America's new frontier," Feb. 11, 2003, http://www.csmonitor.com/2003/0211/p01s03-usgn.html



Aging Farmers – Farms today are being run by a graying population. While farm operators younger than 65 declined from 1.9 million to 1.4 million between 1978-97, the number 65 and older increased from 370,000 to 500,000, for a quarter of U.S. farms. That compares to a 3% over-65 share in the entire workforce. New farm operators younger than 35 grew an average of 15,500 per year from 1992-97. From 1978-82 the annual average was 39,300.[5]

Shifting Ownership Patterns – Small family farms, those with annual sales below $250,000, accounted for 20% of 2003 farm production, down from 32% just 10 years earlier. In 1993, small farms represented 37% of all farms, but by 2003, small operators represented 27%. Over the same period, the share of farm operators who drew most of their income from off-farm work climbed from 36% to 42%. Behind those shifts was a growth in non-family farms, whose overall share of U.S. farm production grew to 14% from 10% over 1993-2003, and large family farms making over $500,000 annually, which over those 10 years expanded from 33% to 44%.[6]

Cash Crunch – Farmers typically receive less than 5% of the value of food sold at retail with the rest going to the food processors, distributors, and retail operators. That translates into cash-poor rural areas. Median non-metro county 2003 income was $35,112, compared to $46,060 in metro counties. The 2003 rural poverty rate of 14.2% exceeded the metro level by 2%, while 20.1% of rural children were in poverty compared to 17.1% in metro areas. Of 386 U.S. counties with

[5] Gale, Fred, "The Graying Farm Sector: Legacy of Off-Farm Migration," *Rural America*, Vol17, Issue 3, Fall 2002, p28-31

[6] http://www.ers.usda.gov/AmberWaves/June05/Findings/ProductionShifting.htm

20% or more poverty rates over the past three decades, 340 are rural.[7] Farmers and rural areas need the new revenue streams generated by renewable energy production.

HOW PUBLIC POWER CAN MAKE A DIFFERENCE TODAY

Public power agencies and their members have an enormous opportunity to help solve rural America's economic crisis. Tapping the opportunity will require a resurgence of interest and involvement similar to the movement that brought electricity to the farms in the 1930s.

Today a new generation of public power leaders are stepping up to the plate as they did in the 1930s by recognizing the potential of renewable energy. Responding to growing interest from their constituents, progressive rural electric cooperatives, public utility districts and municipal utilities from across the country are starting to tap clean energy's potential to revitalize rural economies. They are demonstrating the diversity of clean energy sources available in rural areas, from small-scale installations that run farms and homes to utility-scale facilities that feed power grids. They are finding that many of their ratepayers are so eager for renewable energy development that they will voluntarily pay more for power. They have shown a huge interest in Clean Renewable Energy Bonds, a new financing mechanism made available by the federal government. When public power agencies make serious commitments to provide renewable energy to their ratepayers, they can develop innovative programs to fulfill those commitments

These public power pioneers are showing the way toward a future in which the rural landscape becomes a source of much of America's energy. The farmer-led 25x'25 movement, which includes the National Rural Electric Cooperative Association, has set a goal for 25 percent of U.S. electricity and fuels to be produced on the farm by 2025. A University of Tennessee study projects meeting the goal will add $37 billion in annual farm income by 2025, along with $700 billion in increased economic activity and 5.1 million new jobs, mostly in rural areas.[8]

The rural clean energy opportunity is in its infancy, although six states now require public power agencies to sell renewable power: New Mexico, Colorado, Washington, Oregon, Minnesota and Wisconsin, while others such as California have other obligations.

Public power agencies that embrace this massive opportunity can once again play a central role in a rural economic upsurge much as they did when they originally brought electrical power to farms. Working collaboratively with a variety of other agencies, industry groups and financial interests, they can make farms and rural areas into clean energy fuel producers that benefit the entire nation. They can initiate and drive powerful coalitions with urban allies and thus ensure strong markets for their new energy crops.

Of course the most important contribution public power agencies make to local economic development is to continue fulfilling their mission to provide safe, reliable, high quality power at

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[7] *Rural America at a Glance*, US Department of Agriculture Economic Research Service, Agriculture Information Bulletin #793, Sept. 2004

[8] Burton c. English; De La Torre Ugarte, Daniel G. et al; 25% Renewable Energy for the United States by 2025; Agricultural and Economic Impacts, University of Tennessee, November 2006, p.i

the lowest reasonable cost. This core task continues to be relevant and critically important today. That will continue to be public power's primary focus, even as it explores new energy opportunities that enhance their role as electricity suppliers.

Following are six exemplar rural public power agencies that are showing the way to new rural prosperity by developing the abundant clean energy potential of rural America. They represent the kind of leadership that will begin to make possible a new energy future, leadership that listens to its members and find creative solutions to innovative challenges.

ILLINOIS RURAL ELECTRIC COOPERATIVE

The Illinois Rural Electric Cooperative became the first co-op in Illinois to utilize utility scale wind power after listening to the desires of its members.

Five years ago, the Winchester, Illinois-based co-op polled its members, as it does every year, and asked if it should be involved in renewable energy. "An overwhelming majority said yes,'' recalls Sean Middleton, manager of engineering.

The coop, which serves a 10-county area in a rural part of western Illinois with about 10,000 residents, investigated. It found that a map of wind resources done for the National Renewable Energy Laboratory had determined that one of the four biggest pockets of wind in the state was located in the middle of its service territory.

In 2003, the coop launched more specific wind studies and hired a consultant who looked at the data, determining that a turbine would be feasible. The coop rented space on an existing radio tower to install an anemometer to get exact measurements, saving money compared to erecting a new structure. Middleton notes that lenders and investors insist on at least a year's worth of measurements.

Illinois Rural Electric Cooperative's first wind turbine, completed in May 2005.

Once coop managers had determined they had selected a good site for wind power, they located a nearby location with willing landowners near an Interstate highway -- to help the public relations value of their wind turbine.

Like many other coops, IREC was limited by its power supplier to generating only 5 percent of its power on its own. That limit helped determine that the biggest turbine the coop could install was designed to produce 1.65 MW of wind, a unit in production at the time and appropriate for the conditions.

The Vestas turbine started producing wind power in May 2005. “Our data said we would have a 30 percent capacity factor and we are right there,’’ Middleton says. “It is doing exactly what we thought it should. ”

The turbine’s electricity connects to its distribution grid and offsets coal powered electricity that IREC would have to purchase. IREC estimates it will pay for itself in about 15 years, and the coop expects it to run for up to 30 years.

The project cost $1.878 million, plus $300,000 to upgrade the distribution system to accommodate the turbine. Financial help came through federal and state funds, including a grant from section 9006 of the 2002 Farm Bill that helps fund renewable energy projects, and a loan program through the USDA Rural Utilities Service.

The Illinois project shows the importance of policies at the federal and state level that encourage the development of wind energy. The 9006 program – up for renewal in the 2007 Farm Bill – has made myriad successful small renewable projects possible in rural America. The low-interest loans available through RUS allow coops to make improvements that might not be possible if they had to borrow at full market rates.

”The members just love it,’’ Middleton says. “”The only thing they ask is when we’ll do the next one. We are topped out in the contract and we are negotiating a way to do more.’’

Among the lessons learned were those involving permitting: “”We were going into an area that the local zoning body had never dealt with,’’ he notes. “”It pays to keep people involved in the very beginning.’’ And, he added, permits often take longer than project planners hope.

The member-owned utility based in Winchester, Illinois won the 2005 Wind Cooperative of the Year Award from the U.S. Department of Energy. The award, sponsored by DOE’s Wind Powering America program, cited the coop’s leadership, demonstrated success and innovation.

“We knew it was the right thing to do,’’ Middleton says. “Every kilowatt we get from this is one less kilowatt from a fossil fuel, so that’s a great thing.’’

INFORMATION:
http://www.e-co-op.com/

CHELAN PUBLIC UTILITY DISTRICT

It's a SNAP to contribute to renewable energy in the Chelan County Public Utility District, a sun- and wind-rich county on the eastern side of the Washington Cascades.

The Wenatchee, Washington-headquartered Public Utility District makes small scale solar and wind power more cost-effective because customers voluntarily pay extra for renewables, and the PUD distributes the funds to producers who are generating power that feeds into the energy grid. Together, they make possible SNAP – Sustainable Natural Alternative Power, the PUD's award-winning renewable energy program.

Jim White, who oversees the renewables program, notes that customers who contribute to renewable power aren't buying a set amount of power but rather pledging a certain amount that will all go to support local renewable projects. Their contribution is itemized each month on their bills.

On the other side are local producers, who put renewable systems on their homes or businesses. The utility installs a meter on each system to measure all of the solar, wind and small hydro produced in the county. Once a year, around Earth Day, the producers split the total funds contributed by the consumers, based on how much energy they produce.

Approximately 600 of the public utility's 33,000 customers contribute roughly $30,000 a year to the program. A producer who generates 5% of the total renewable power generated in the county, will get 5% of the contributions made to the SNAP program that year.

White says a big benefit of the program is getting utility workers familiar with the systems. "It's kind of a mustard seed of a program in terms of what it actually produces, but it plows the field for future systems,'' he says. "The barriers are not technical. Many utilities are resistant to generation on the customer side of the meter. This says we are encouraging it.''

And that attitude helps overcome resistance from some of the utility workers who are responsible for the technical issues on interconnecting small solar, wind and hydro to the grid. "Initially there was some resistance, but they came around. The first jobs we did there would be about 35 people out there on a 240 watt system of four solar panels – everyone from distribution engineers, code officials, guys from generation. But we've overcome a lot of the apprehension.'' Now, such installations are all but routine", White says.

Chelan started its program in 2001, and won the 2003 National Renewable Energy Recognition Award from the Interstate Renewable Energy Council. Others have followed. A Washington state production credit adds to the economic benefit. Three other utilities in Washington are now administering their own SNAP programs which can be launched based on information available on the web site. Chelan doesn't charge for use of the program but asks that others register their name.

The Alcoa Community Solar Endowment and the International Brotherhood of Electrical Workers (IBEW) are among the community supporters. They contributed more than $1 million in materials and labor that made possible more than 30 solar systems at all schools along with seven nonprofit agencies in Chelan County.

The most challenging part of implementing SNAP has been getting billing systems working properly and collecting the money. Because each system is separate and unique, programming the utility's accounting software to properly bill the systems was a little tricky. But White says the SNAP program is a worthy way for utilities to encourage renewable energy development that aids local communities.

The SNAP program illustrates how a local power public agency can set up a successful program which benefits from incentives—such as the state production tax credit. Along the way, starting a small program allows all those involved to learn how to make it work from technical and financial perspectives.

"The money stays local, public power is generated by the public and supported by the public. The public creates the demand and the public creates the supply,'' explains White.

INFORMATION:
http://www.chelanpud.org/snap.html

DAIRYLAND POWER COOPERATIVE

Moove over, wind.

So states a brochure of the Dairyland Power Cooperative, headquartered in La Crosse Wisconsin as it touts "cow power.''

Since 2005, Dairyland has expanded its renewable energy portfolio to generate electricity from cow manure.

Dairyland partnered with Microgy to build mini power plants on three working dairy farms. Cow manure is collected and heated in a digester tank and over approximately a three week period, the anaerobic digestion creates methane gas which becomes the fuel that powers generators.

The generation and transmission cooperative supplies wholesale power to 25 electric distribution cooperatives and 19 municipal utilities who serve more than half a million people in four Midwest states.

Dairyland's resource planners work with interested farmers to decide the best locations for the facilities and hope eventually to build them throughout their service territory.

Each of the digester facilities generates between 775-840 KW of energy, -enough to power approximately 600 homes. Dairyland hopes eventually to generate 25 MW of renewable electricity.

"The great thing about this is it benefits everyone. Consumers receive renewable energy, and it benefits the farmer in a variety of ways'' explains Dairyland spokeswoman Katie Thomson.

Dairyland owns the generating equipment and distributes electricity through coop lines back to the Dairyland grid to all its member coops. Microgy designs and constructs the digesters, then operates and maintains them. Revenue collected currently goes to pay off the systems, but when they are paid for they will be owned by the farmers and provide a new stream of income. .

Lee Jensen, owner and general manager of Five Star Dairy in Elk Mound, Wisconsin, provided all his manure to launch the first system, which started generating electricity in June 2005.

While there have been some start-up issues, he says the system is now working well—and provides more than power. ""There are a half a dozen direct benefits to the farm aside from the money,'' he said.

The digested manure loses its odor and is suitable for bedding, which saves money. The process kills weed seeds, which allows him to cut down on herbicide. It raises the Ph level, which reduces the lime he needs to apply to the fields. Pathogen reduction makes the manure safer for the environment, including the groundwater.

"Besides, being known as a green energy producer gives a good perception of the farm. And the ability to market some carbon credits is another income stream,'' Jensen says. Once the system is paid off, he notes, "It's an income stream that I've kind of got earmarked for my retirement—something we've never had before.''

Each farmer has a contract with Dairyland for the methane gas. "We buy the gas and the farmer doesn't have to worry about running the plant,'' Thomson says. "The farmer farms and we operate the power plant on approximately an acre of land.''

Dairyland shows the benefits of distributed generation to rural communities, allowing each farmer to gain an income stream from the operation of small power plant on his or her property.

Like any new technology, operating the digesters has involved a learning curve, but Thomson said Dairyland is pleased with the operation. Manure is collected and heated in a digester tank at

120 degrees for about three weeks. The resulting methane gas is used to fuel a generator, which sends electricity to the coop.

For farmers, making energy from manure makes sense in rural areas of Wisconsin, Minnesota, Iowa and Illinois where Dairyland operates. The air and water pollution problems associated with manure are major issues and the digester significantly reduces them, while also producing the useful byproducts of bedding and fertilizer naturally.

”There’s no worry about the energy source—it’s certainly abundant and always at the ready,’’ Thomson adds. “Our goal is to expand with more operations like this. We’d like to develop them throughout our service territory.’’

INFORMATION:
www.dairynet.com

ARKANSAS RIVER POWER AUTHORITY

Jim Henderson, general manager of the Arkansas River Power Authority in southeastern Colorado, has a clear opinion about the wind turbines that supply nearly 8 percent of his agency’s power.

“It’s been a wonderful experience from our point of view,’’ he says. “We very much like wind power.’’

Henderson’s agency and a small municipal utility it supplies with power, Lamar Light and Power, teamed up on a “piggyback’’ wind project that could be a model for others around the nation.

As the large Colorado Green wind project was being developed early this decade, the two public power agencies hired a California wind energy company, Sea West, to do feasibility studies for installing turbines in their nearby area.

As Henderson explains, because the public power agencies were within 25 miles of the large commercial project, turbine manufacturer General Electric was willing to sell the equipment and to maintain it at an economic rate.

“I’m not sure that regardless of how good our project was, in terms of wind, that we could have gotten the kind of support for the project if the larger project wasn’t there,’’ Henderson says.

As it was, General Electric had already answered many of the questions about the cost and logistics of delivering to the remote area. “If this was a standalone project, the real problem would be getting GE to address a problem with the wind turbines on a timely basis,’’ Henderson explains. “Now that we have a maintenance crew in the area, it’s just a matter of scheduling.’’

He says it's to "everyone's advantage'' to consider a community-scale wind project whenever a large commercial wind farm is being developed in an area. Piggyback projects can take advantages of the economies of scale utilized by big projects.

Rick Rigel, superintendent of Lamar Light and Power, says the presence of the big wind farm nearby means expert maintenance is easily accessible. ""I wouldn't want to undertake it without that expertise in our backyard,'' he says.

Lamar erected three turbines, each capable of producing 1.5MW, at a cost of roughly $1.7 million, and financed them by issuing $6 million in revenue bonds. ARPA erected two additional turbines of the same size, and also buys and then sells back Lamar's output. The turbines generate about 24 million KWh year, supplying nearly 8 percent of ARPA's needed energy.

The biggest challenge of wind energy, Henderson notes, is its variable nature. None of the turbines are connected directly to the Tri-State Generation and Transmission system, but ARPA gets its network transmission from Tri-State and must pay network imbalance costs if its estimates are off. "From minute to minute, you can predict the output, but from hour to hour, we do the best we can. The most challenging part of it is the energy imbalance cost.''

Rigel says that if ARPA has to buy unscheduled power from Tri-State because the wind wasn't blowing, the cost is significantly higher than the payment received by ARPA when it produces more than scheduled. The disparity in payments is " a very punitive arrangement in my opinion,'' says Rigel.

The turbines produce their maximum amount of energy when the wind is blowing between 26 miles per hour and 56 miles per hour. The turbines shut down at higher speeds and generate lower levels of power at slower wind speeds.

The wind power costs 3-4 cents per kilowatt hour, comparable to other sources.

If there were a way to store electricity economically on a utility scale, Henderson says his utility would build more wind power. Absent that storage, he notes, "wind will not stand alone without traditional generation.''

Some public power agencies are examining ways out of the storage dilemma. Iowa municipal utilities, for example, are working to develop a way to store wind power through compressed underground storage.

Henderson notes that while wind energy includes ongoing expenses for insurance, land payments and maintenance, the wind that drives the machines is free—and abundant.

"As long as you use it in a way that you have traditional resources to coordinate with the wind, it can be a wonderful resource for everyone,'' Henderson says. " We feel very fortunate in southeast Colorado to have the kind of natural resource in the wind to be able to use our turbines.''

INFORMATION:

http://www.ci.lamar.co.us/lightpower/info.htm

ASHLAND, OREGON ELECTRIC UTILITY

The municipal utility in Ashland, Oregon continually looks for ways to get its citizens involved in renewable energy.

The latest plan will allow residents to buy and own a part of a community-owned solar system. Ashland applied for CREBS, or Clean Renewable Energy Bonds, made available in the 2005 federal Energy Bill, and plans to put up a $500,000 solar energy system of at least 60 KW on a municipal structure. Citizens will be invited to buy a virtual share of the system on a voluntary basis. They'll get a credit on their bill for the energy generated by their portion of the solar system.

"The idea is to use our facility and our ability to aggregate-- but let people own a small part of the system,'' explains Dick Wanderscheid, Director of the Electric Utility.

The southern Oregon town of about 20,000 has long had been a leader in renewable energy programs.

Ashland cobbled together funds from a variety of sources to install 30 KW of solar electricity on numerous buildings. Two major components are photovoltaic panels on the Oregon Shakespeare Festival and Southern Oregon University. Ashland agreed to buy the output of the systems at 25 cents per KWh until the institutions recoup their investment.

The community's municipal utility asked citizens to voluntarily contribute to the costs of the solar systems by becoming Solar Pioneers. More than 260 residents and businesses generated nearly $30,000 to finance the projects by agreeing to add a surcharge of $4 a month to their electric bills to support the photovoltaic systems and provide funding to purchase those solar kilowatts at the higher rate.

"Those systems have been in operation for six years and we've contributed back about two-thirds of the cost,'' Wanderscheid says. ""When they are paid off, they revert to net-metered systems, and the (university and festival) will own them.''

Ashland also has installed a 15KW photovoltaic system on the police station which generates electricity sold to Bonneville Power Administration for its green Power programs. The other 5 KW on the city council chambers also generates green tags to the Bonneville Environmental Foundation.

Ashland adopted a net metering policy more than a decade ago-- long before such policies were commonplace. And the policy remains a model. The utility provides a high tech digital meter at

its own expense and reimburses customers for any excess power that they generate. Any month that a customer generates more power than he or she uses, Ashland gives full credit at the retail rate for the first 1000 KWh of excess generation.

The community also started offering rebates for solar water heaters, and offers no-interest loans for more renewable generation systems and energy efficiency initiatives. Additionally, residents can buy green tags from the Bonneville Environmental Foundation under a cooperative marketing agreement that generates additional revenue to Ashland for every green tag purchased. This money is used to add more solar generation in the city.

A key benefit is that in addition to employing good field people who can help make conservation and efficiency projects succeed, the utility contracts all the work to the private sector and has thus helped create work and expand the local conservation infrastructure. “”We have a good partnership between the private sector doing the work and the public sector making sure housing stock is improved over time,’’ Wanderscheid says.

The municipal utility touts the benefits of promoting self-sufficiency. “”We have a good solar climate for Oregon and a lot of interest in doing this,’’ Wanderscheid explains. “We believe a kilowatt generated for our customer benefits customers and our economy.’’ And he notes, if he buys power from his customers, the money stays in the community.

Ashland’s comprehensive program shows how policies enacted by state, federal and nonprofit agencies can benefit an innovative community. From the use of federal CREBS bonds to the use of the respected Bonneville Environmental Foundation green tags to add more solar power, Ashland has found ways to expand on renewable energy programs.

Wanderscheid’s advice for others? “The key is to educate people and make it easy for citizens to utilize the program,’’ he says. “”Show them that in the long run it will be something that benefits them and the environment.’’

INFORMATION:
http://www.ashland.or.us

DELTA-MONTROSE ELECTRIC ASSOCIATION

In a scenic area of Western Colorado that’s solidly Republican and still dominated by agriculture, the Delta-Montrose Electric Association has emerged as a beacon for what progressive rural coops can become.

The coop believes its mission is to supply reliable electricity at reasonable prices—and to do much more.

DMEA created a subsidiary called Intermountain Energy that offers GeoExchange heating and cooling systems that rely on ground source heat pumps. By using underground pipes that use the relatively stable temperature of the earth and then raise or lower it to 71 degrees, customers can

heat and cool homes at costs up to 75 percent less than other sources. The coop offers qualifying members to finance 100% of the installation costs at 7.5 percent interest for up to 30 years.

The spread of the program shows that a federal incentive program is working: The 2005 Energy Act gives homeowners up to $300 credits for qualifying systems.

DMEA says many customers can realize lower costs because the energy savings are greater than the monthly loan payment and energy bills. Energy use modeling done by DMEA predicts that consumers would have annual heating and cooling costs of $670 with geothermal heat pumps at today's energy prices, far below comparable prices for traditional heat sources This forecast is based on keeping an average 2,500 square foot home at a comfortable 70 degrees in winter and 72 degrees in summer.

With 31,300 meters in service, DMEA officials are interested in providing utility ownership of ground source heat pump ground loops as part of its utility plant and planned to seek approval from the board in the spring of 2007. The investment, officials say, could be recovered through a special tariff along with the revenue generated by the heat pump. The coop is hoping to borrow funds at low RUS rates to make ownership economical.

"That would provide the ability to fund it over a longer period of time,'' explains general manager Dan McClendon. ""It's the most efficient HVAC technology out there. The hurdle is the upfront capital cost – that's what people have shied away from. ''

If the coop provided the system and owned the loop of pipes running underground, McClendon noted, ""It's beyond affordable. It's a wise thing to do for our country.''

DMEA promotes other steps toward a new energy future. A self-guided tour at the energy subsidiary offers a wealth of information about efficiency and conservation. The "Brightening our Communities'' campaign helps nonprofits raise money –and awareness—through the sale of energy-saving compact fluorescent light bulbs.

INFORMATION:
http://www.dmea.com/

THE RURAL CLEAN ENERGY BOOM

Wind power is the greatest emerging opportunity for rural clean electricity production. U.S. wind grew 27 percent in 2006 to 2,454 megawatts (MW), with similar growth projected for 2007. The 2006 investment of $4 billion was second only to natural gas for new power generation. Now 11,603 MW on wind turbines, virtually all located in rural areas, pump out enough electricity to serve three million U.S. homes. [9] Now delivering power to markets at prices that are in many cases economically competitive with fossil generation, wind is also providing demonstrably superior local economic benefits:

- Farmers who lease land to wind developers typically are paid 2-3% of revenues, around $2,000-$7,000/year per turbine depending on the amount of power production. Each turbine takes only around one-half acre, mostly in access roads.
- Each 100 MW adds $500,000-$1 million in annual property tax revenue.
- During construction each MW generates 1-2 jobs. Operation and maintenance requires 2-5 permanent jobs per 50-100 MW. [10]

A study by Renewable Northwest Project (RNP) shows 954 MW of new wind power has brought the Pacific Northwest:

- $1.38 billion in new capital investment;
- between $2 million and $3 million in annual royalty payments to rural landowners;
- between $5.8 million and $6.8 million each year in local property tax revenues;
- approximately 1300 construction jobs during peak construction periods;
- roughly 80 new permanent family-wage jobs for operation and maintenance.[11]

Because wind power uses local "fuel," it can have better direct economic impacts than investments in either coal or natural gas. A National Renewable Energy Laboratory (NREL) analysis compared economic benefits from equivalent fossil power investments in Arizona, Colorado, and Michigan. NREL concluded "equivalent generation of wind power will bring the highest direct economic benefit to the state."[12]

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[9] American Wind Energy Association, "Wind Power Capacity in U.S. Increased 27% in 2006 and is Expected to Grow an Additional 26% in 2007," Jan. 23, 2007

[10] Larry Flowers, U.S. Department of Energy, *Wind Power Market Update*, presentation to Harvesting Clean Energy Conference3, Feb. 10, 2003, www.harvestcleanenergy.org

[11] Wind Power & Economic Development :Real Examples from the Pacific Northwest, Renewable Northwest Project

[12] S. Tegen, *Comparing Statewide Economic Impacts of New Generation from Wind, Coal, and Natural Gas in Arizona, Colorado, and Michigan*, Preprint Conference Paper, NREL/CP-500-38154 August 2005

The RNP study found, "If the electricity generated by the seven new (Northwest) wind farms was generated at modern natural gas plants instead, the plants would drain $62-$109 million out of the regional economy every year to pay for imported natural gas."

An analysis of the net economic benefits to Nebraska from a 10 percent renewable energy standard shows that investments in renewable energy will deliver 360 more jobs, $8 million more in income, and $35 million more in gross state product than equivalent investments in coal or natural gas power. These clean energy investments yield $2.2 million in annual royalty payments to farmers and landowners $2500/turbine/year. Ainsworth is $2500 + 2.5% annual escalator for 25 years) and $5.2 million in local property tax revenues.[13]

Local ownership brings even greater benefits. NREL compared the effect of a 40 MW corporate wind farm owned out- of- area and 20 two MW wind plants owned locally. Looking at 11 locations, the study found local ownership yields an average of $4.06 million in local income annually, more than three times as much as the $1.3 million produced with out-of-area control. Job creation in the local model was more than twice as large as the corporate model.[14]

A CHANGING CLIMATE FOR THE UTILITY SECTOR

All electrical power utilities, whether consumer- or investor-owned, face a rapidly changing economic climate driven by the emergence of concern over global climate change caused by human fossil fuel emissions. Whether or not individual utilities consider climate change an issue, public concern is already changing the power market landscape. Through recent legislation, California and Washington state have essentially barred new coal-fired power from their state markets, and Oregon is considering a similar measure. This is already having impacts on coal-plant construction plans in the Intermountain West.

Many investor-owned utilities are making plans based on expectations of a price on fossil fuel emissions, acquiring substantial renewable resources to hedge their cost exposure. Meanwhile, a new Energy Plan passed by the Idaho Legislature in 2007 includes a provision that, "Idaho and Idaho utilities should prepare for the possibility of federal regulation of greenhouse gas emissions." West Coast and Southwest states have already joined in a plan to cap and price power plant emissions, while Northeast states are already implementing such a system. National legislation along those lines is widely expected to pass Congress within the next several years.

Some of the strongest statements regarding both the risks of climate change and the opportunities for clean energy producers are coming from the financial community.

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[13] Steve Clemmer, *Strong Winds: Opportunities for Rural Economic Development Blow Across Nebraska*, Union of Concerned Scientists, NWCC Wind Energy and Economic Development Workshop, March 15, 2001

[14] *Renewable Energy; Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities*, General Accounting Office, Sept. 2004, p82-3, http://www.gao.gov/new.items/d04756.pdf

"Climate change is a topic that should be on the agenda of every Board of Directors," Goldman Sachs states. "The risks are great and varied. However, there are also potential opportunities."

Lehman Brothers also sees "considerable opportunities. Recent and rapid technological innovation is stimulating growth in new and existing industries, as markets receive somewhat clearer signals about, and draw inferences concerning, the long-term growth potential of 'low-carbon' products and services."

"The need to revolutionize the way we use energy opens up a new universe of options for economic development and social benefits,'' says Allianz Global Investors. The future outlook for the low-carbon energy market is promising. According to the International Energy Agency, investment in cleaner energy at present is $20 billion a year, mainly to solar and wind power, (and is) expected to grow to $100 billion globally within 10 years"

Abundant potential for rural areas to generate clean electricity represents a significant low-carbon opportunity. Public power agencies that drive development of clean resources give their service areas a competitive edge, while areas that rely too much on coal face significant financial risks.

A PUBLIC POWER AGENDA FOR CLEAN ENERGY DEVELOPMENT

For rural America, the clean energy opportunity is clearly emerging as the booming growth of biofuels plants and wind farms demonstrates. Public power agencies can drive development further by marshalling their resources behind locally owned clean electrical power generation. Leading public power institutions are moving to realize the opportunities now opening as renewable energy technologies become cost-effective.

This is important because if local agencies do not act, state and federal governments as well as large outside businesses will inevitably fill the vacuum. Public power agencies are well situated work with local landowners to develop local resources for the greatest benefit of the local community. Distant organizations cannot be expected to do the job as well.

Public power leaders can take a number of steps to develop locally owned clean energy resources in their service areas:

1. **Make ratepayers into power suppliers through locally-owned distributed generation.** Local wind, biogas and other clean energy installations diversify power resources available to utilities. When utilities buy power from their own ratepayers instead of outside generators, they keep money circulating in the local community and build up the local economic base. In some cases local generation might also provide line support. In their resource planning utilities should seek to identify "non-wires" solutions where local generation reduces overall costs by deferring or avoiding added pole-and-wire infrastructure. Local generation must be designed, maintained and operated in cooperation with the local utility to ensure that it is located where the system needs support and operates reliably when the system needs it.

2. **Implement renewables policies that do not penalize variable energy sources.** Distribution utilities and wholesale suppliers need to cooperate in developing mechanisms such as contracts that allow exemptions from all-requirements contracts to allow community renewable energy development. The Bonneville Power Administration provides a good example of a transmission organization that offers hydropower resources to balance wind.
3. **Adopt standard, streamlined policies for interconnection.** Such policies provide certainty to generator-owners by reducing the cost of connecting to the grid, and can easily make the difference whether projects happen or not. Work with other utilities to develop statewide standards.
4. **Build up broadband telecommunications networks**. (some public power such as in Nebraska do not have Tele-com in their charters because it competes with private enterprise, others may also have the same road block) Distributed energy networks made up of many local generators will require broadband backbone to control and dispatch power flows. Broadband has many other applications that will allow rural economies to flourish. It gives farmers real-time access to market data, allows information-oriented businesses to locate in rural areas and opens the way to services such as tele-education and tele-medicine. Many utilities are already engaged in telecommunications. For example, more than a dozen Washington state public utility districts have created fiber networks.
5. **Understand local energy generation potential, particularly for wind power.** Work with landowners to set up wind monitoring equipment at various sites. Explore the opportunity of "piggybacking'' community projects on large commercial wind developments. Both the Lamar and Illinois examples in this paper showed that an understanding of the local potential was critical to success.
6. **Serve as a technical resource for rural entrepreneurs.** Public power agencies will have to work out the technical issues of bringing new energy sources on line. In doing so they will develop technical expertise that can be shared with rural landowners and entrepreneurs who are exploring energy opportunities. Public utilities can offer extension-type services for energy. As both Ashland and Chelan PUD illustrate, small scale, local projects allow utility workers and entrepreneurs to learn together, and private sector jobs to be created as a result.
7. **Promote innovative use of financial resources available to public power agencies.** Lowering the cost of capital opens the way for many projects. Low-interest funds are available through the USDA Rural Utility Service as well as through Community Renewable Energy Bonds (CREBS) which can finance virtually any renewable energy project. A reformed federal PTC or similar financial instrument easier for small investors to use should be explored. Adequate funding for these federal programs is essential for progress to spread in areas where capital is tight.
8. **Establish strong partnership relationships with key organizations**. Public power agencies cannot drive clean energy development on their own and need to develop creative partnerships to assemble financial and technical resources. Many organizations have contributions to make including local governments, USDA Rural Development, land grant universities, state agriculture and energy agencies and financial institutions.

9. **Explore partnership opportunities with biorefineries**. Facilities making biofuels and coproducts are major energy customers. New greenhouse gas standards for fuels being implemented in California and proposed elsewhere will provide competitive advantage to biorefineries that employ renewable rather than fossil energy. Utilities and biorefinery developers should partner to identify renewable resources such as wind and biogas. Biorefineries also increasingly will be energy generators, for instance using the lignin co-product of cellulosic biofuels to supply heat and electricity. So they might have surplus energy to sell. Utilities should envision biorefineries as prospective energy suppliers as well as loads.
10. **Weigh in on the 2007 Farm Bill.** The 2002 Farm Bill incorporated the first ever energy title. One part in particular has driven rural clean energy, Section 9006 providing grants and loan guarantees for on-farm renewables and efficiency. The section has been funded at around $23 million per year. Expenditures of $76 million from 2003-2005 leveraged nearly $800 million in capital investments.[15] Increasing annual funding tenfold to $250 million could generate ten times that in private investment for farm-based clean energy. Section 9010 provides support for bioenergy crops. Fully funded to its $150 million authorized level, it could spur new crops such as oilseeds for biodiesel and perennial grasses for ethanol or power plant fuel. As several examples in this paper have shown, such modest federal investment can pay handsome dividends for communities.

RURAL PUBLIC POWER FOR THE 21ST CENTURY

Public power played a central role in bringing rural America into the 20th century by lighting up the countryside and using electrical service to make agriculture more productive. Public power now has an opportunity to lead rural American to a brighter future. By growing into a major energy producer for its own needs and those of America as a whole, rural America can become vibrant and prosperous once again.

This paper has shown how innovative public power leaders from the Midwest through the Mountain States and Northwest are already moving to build the rural clean energy economy. But many other public power utilities have yet to fully embrace this opportunity. Now is the time for public power as a whole to take lessons from pioneering public utilities and update its mission for the 21st century, to further local economic development by catalyzing the development of rural America's abundant clean energy resources.

Many public power leaders are concerned about mandates from other levels of government and that's why taking the lead on voluntary initiatives is critical. As Colorado's new governor, Bill Ritter, recently said, rural communities are "important drivers'' of the new energy economy and not just participants. Public power agencies are situated to promote this rural clean energy growth in ways that provide the greatest benefits for local communities by launching initiatives, building alliances with urban consumers and together overcoming obstacles for market development.

[15] Environmental Law and Policy Center, *An American Success Story: The Farm Bill's Clean Energy Programs*

Public power agencies need to collaborate with many other interested parties; the changes needed for a massive transition to renewable energy will require everyone working together. While this paper has demonstrated that certain changes can occur at the local level, many others require policy changes at the state, regional and federal levels – policies governing transmission, financial incentives, imbalance payments and the like. Public power is positioned to lead the coalitions that will be necessary to achieve consensus on these difficult topics.

Crucial national demands are now converging for energy that is secure, clean and economical. Our nation's security and our planet's future depend on success. Public power is in the perfect position to lead the initiative that makes the transition to renewable energy successful for rural America as well as the nation as a whole.