

# Renewable Energy

## Business

### UNDER CONSTRUCTION –

Please check back soon.

### 1 thought on “Business”



*Christopher cowan* on May 12, 2021

Hi my name is Christopher Cowan and I am looking in to and researching and interested in what it takes to start run and maintain a 10 to 20mw solar farm/power plant and energy storage facility's in Lake County I am currently in the process of purchasing a piece of land (5 acres)for a homestead that I also would like to be off grid on my homestead in Christmas valley (a long time goal i am finally getting achieved) but I am looking for the entry in to the process of getting the paperwork started for building opening and maintaining a 10 to 20 MW solar Farm/power production and storage plant and finding big enough piece of land that way I can get my business plan started to be created and getting the costs of building and maintaining thus said farm for at least 10 to 15 years building a solar farm has been a dream of mine since I was knee high to a grasshopper ever since I was introduced to solar energy I have been drawn to the pull of natural energy without hurting our planet and I would like to produce energy to help people live more cleanly for our environment and I have done alot of research in to this subject and I would also like to research ways to make production more efficient so I would like to talk with someone about my ideas and what it takes to get this rolling thank you

Sincerely

Christopher cowan

My company would be called

“Duh cowrex solar energy connection and collection” any input helps

Reply

## Community

### Renewable Energy as an Economic Development Strategy

The Presidential election is now over and hopefully the grid lock in Washington, DC will come to an end. With new drilling techniques and fracturing more oil and natural gas will be produced in this

country. LCRI hopes that just because of these advances we do not as a Nation go back to the 70s where following the oil embargo we did not pursue changes in our energy policy. We cannot waste another 40 years and let some future generation deal with energy shortages that we could have overcome today.

Rural areas like Lake County that currently do not have natural gas and utilize fuel oil, propane or electricity can realize considerable economic development through renewable energy. The Richard



Gardner, PhD Economist, study on 22 renewable energy projects in Lake County for the Ford Family Leadership Institute showed that over the life of the equipment the net present value for those projects is \$1.9 million or an average of \$86,000/project. These savings that were once dedicated energy costs now become new expendable income that can be spent on such things as education, food, new vehicle, new hires, etc. The report also states that with the projects LCRI is currently working on the value could reach \$9 million. Please review the study in more detail at [Lake County: New Income From Renewable Energy Cost Savings](#). The easiest and most cost beneficial renewable energy savings is replacement of outdated windows, lights and added insulation.

There are places that will point out that they do not have the resources we enjoy here in Lake County. While that is true, if you do not have geothermal or solar resources there are opportunities. Ball State University in March 2012 completed a ground source heat pump that will heat and cool the campus saving them an estimated \$2 million/year (<http://www.bsu.edu>



[/news/article/0,1370,7273-850-65616,00.html](#)).

Small scale biomass is another way to produce heat and help maintain healthy

forests, <http://www.oregon.gov/energy/RENEW/Biomass/Pages/assessment.aspx>. Two great examples of small biomass are Sisters High School and Burns Hospital and depending upon the facility they can save \$60,000 to \$100,000/year. In the case of schools this could mean not cutting existing programs in these hard economic times and/or hiring another teacher. Both the Oregon Department of Forestry and Oregon Department of Energy have specialist that help you determine systems that might fit your situation. Ground source heat pumps can be utilized anywhere you have heating or cooling needs.

An area where LCRI would like to gain some expertise in is renewable community investment projects. The Lakeview geothermal project to the schools and hospitals is an excellent community project.

## Industrial

### Utility Scale Type Renewable Energy Projects



photo by Tom Gauntt, Pacific Power

November 9, 2012 was a great day for Lakeview and Lake County as Pacific Power held a ribbon cutting ceremony for their 2MW Black Cap Solar Project. The project has 9,000 solar panels that will produce enough electricity for 400 homes. The day was cold, snowing and windy; even with these conditions and with cloud cover the solar project was producing at 30%. Pacific Power sent all their top Executives including Pat Reiten, Pacific Power president and CEO to the ribbon cutting and following the outside event Pacific Power had a terrific lunch at the Gathering Place.

Swinerton, Inc. was the construction company for the project and used about 80% local contractors on the project. While solar projects do not create many permanent jobs they do create construction jobs and pay taxes. In a county that is 78% government land, means 22% of the private lands pay for the amenities that the general public wish to have such as roads, excellent hospital, good schools, etc. The amount of taxes paid will vary with the size of the solar project but this graph is an example of a solar project in Lake County. We currently have two solar projects completed, another one that is going to be built. Pacific Power has a need to build additional solar projects to meet Oregon's Portfolio Standards for solar and hopefully Obsidian Finance will get the bid here in Lake County and when finished Pacific Power will take over ownership. Start multiplying the figures in the graph and solar will definitely help maintain and provide jobs in all the respective taxing districts.

Obsidian Renewables, LLC was the primary contractor for building Black Cap and Outback solar projects and is proving to be an excellent community member. Adjoining Black Cap is Obsidian's 366 kW solar system, that will transmit operational data directly to Lakeview High School as well as LCRI, where it can be used in classes to teach math and engineering concepts. Utilizing LCRI, Obsidian prepared a Blue Sky grant and will be building a FFA/4-H barn on the acreage at Black Cap that will be utilized for students that want to raise animals but don't have a place to keep their animal. Electrical power to the barns will be provided by the project. Lake County OSU Extension Service is working with the Lakeview High School to build the barns in sections at the school, that later can be put together at the site.

The Black Cap Solar for a short time was the State's largest solar project. Constellation, an Exelon Company out of Chicago, just completed a 5MW project in Christmas Valley making it the State's largest. Element Power has purchased the development rights from Lincoln Power and possibly will build even a larger solar project. So with these projects it looks like Lake County will continue to have the State's largest solar energy projects for some time into the future.

Another positive development is the Paisley Geothermal project. When drilling the reinjection well



for the City of Paisley geothermal 2MW plant they hit another excellent source of geothermal and as a result the project will be a 3 MW plant. For the second time when drilling for a reinjection well they have hit a better and hotter source of water. The plant is currently under construction and the generator will be delivered to the site in April 2013.

On this website under **about us and under publications** there is an economic report by Richard Gardner outlining the job potential for these Utility Scale type projects, see **Table 5**. Oregon Business tells us that every job created in rural areas such as Lake County is equivalent to 100 jobs in Multnomah County.

In 2008 the Lake County Renewable Energy Working Group set a goal of producing more renewable energy than can be consumed in Lake County by December 2012. This was right before the recession and as a result we will not make the December 2012 goal. While that is the bad news, the good news is we anticipate making that goal and we estimate it to happen in 2013-2014 depending upon market turn around.

# Renewable Energy Instillations in Lake County

## Lake Health District Hospital and Lake County School District #7:



Lake Health District Hospital



The Daly Middle School, now the Innovation and Learning Center



Fremont School (grades k-3)



Arthur D. Hay School (grades 4-6)



Lakeview High School (grades 7-12)

In January 2009 Anderson Engineering and regional experts in geothermal systems, completed a, grant funded feasibility study to determine the ability of this project to meet the heating needs for all the buildings of the school district and hospital. The study was done with the Town of Lakeview acting as the utility and the LCSD#7 and Lake District Hospital acting as the consumers. Due to the in-dept feasibility study, LCSD#7 was able to procure \$1 million in grant funding to complete a geothermal retrofit of the buildings which converted the existing diesel fired boiler system to be able to accept geothermally heated water. The total cost of the geothermal source project was \$3.8 million. No upfront cash was used for this project. Funding for this project is through a \$800,000 state Business Energy Tax Credit Program (BETC) and a \$3 million U.S. Department of Agriculture Rural Development Community Facility Loan to be paid back over a 40 year period at 3.5% interest rate. The town owns and operates the system and repays the loan using money generated from selling the heat to the school and hospital districts.

**Quick Facts:**

- The system went online December of 2013
- The geothermal system is designed to extract up to 5 million BTU's of heat per hour to meet the heating demands of both the hospital and school district
- Annual carbon reduction from not burning diesel fuel = 800 tons/year
- Annual budgeted heating savings for LCSD#7 = up to \$100,000/year
- The district has not burned a single drop of diesel to heat all of the in-town school facilities since Devenember 17, 2013
- Buildings utilizing this: Lakeview High School, Daly Middle School , Arthur D. Hay School, Fremont School, and Lake Health District Hospital

Below is a Heating Comparison Cost Chart. Yearly savings on energy vary with the cost of other sources of energy:

<b>*Heating Costs Comparison Chart</b>	
<b>Heat Source</b>	<b>S/million BTU</b>
Propane	\$24.60
Heating Oil	\$25.00
Electricity	\$24.90
Geothermal w/ loan	\$14.22
Geothermal w/o loan	\$5.00

\* Updated 7/14

# Warner Creek Correctional Facility Geothermal System



Warner Creek Correctional Facility in Lake County

- Total project cost was \$1.2 million including a \$200,000 maintenance fund over the expected 50 year life of the system.
- The system saves \$19,000 per month, or \$228,000 annually since switching from propane to geothermal heating.
- The payback period on the project after completion in 2005 **was only 4 years**
- The prison uses approximately 50% of the capacity of the system. This portion of the system delivers enough water for 400 inmate's showering, laundry needs, and kitchen needs for hot water. It also heats the 117,000 square foot facility

## Solar Installations:

### Black Cap



#### Quick Facts:

- The 2MW installation went online in November of 2012
- Developed by Obsidian Renewables, LLC for PacificCorp (which operates as Pacific Power in Oregon) in 2012
- Located 2 miles west of downtown Lakeview on a 20-acre site
- Uses single-axis tracking to tilt automatically to follow the sun and maximize efficiency  
Generates approximately 4.6 million kilowatt hours of energy annually – or approximately enough energy to power 400 homes each year
- During construction, over 90% of the labor was from local sources

## Outback



### Quick Facts:

- The 5.7MW array went online in January of 2013
- Developed by Obsidian Renewables, LLC and Smart Energy Capital
- Received \$15 million in incentives from the state's Business Energy Tax Credit Program and the Energy Trust of Oregon for construction
- Constellation Energy financed and owns the array, having acquired it in October of 2013
- Portland General Electric purchased the power by the plant via a 25-year power purchase agreement
- Uses single-axis tracking to tilt automatically to follow the sun and maximize efficiency  
Generates approximately 10 million kilowatt hours of energy annually, the equivalent to the energy use of 1,000 homes each year
- Around 80% of the 40-50 short term jobs went to local Oregonians
- Located 9 miles east of the town of Christmas Valley, Oregon on 50 acres of land

## Lakeview 363



### Quick Facts:

- The 363kW array went online in the fall of 2012
- Developed by Obsidian Renewables, LLC through Pacific Power's Oregon Solar Incentive Program in 2013



- Uses single-axis tracking to tilt automatically to follow the sun and maximize efficiency

## Lakeview 500



### Quick Facts:

- The 500kW array construction was completed in December of 2013
- Developed by Obsidian Renewables, LLC through Pacific Power's Oregon Solar Incentive Program in 2013
- Uses single-axis tracking to tilt automatically to follow the sun and maximize efficiency
- The system generates almost 1 million kilowatt hours annually

## Lakeview 4H and FFA Farm



### Quick Facts:

- The 10kW array went online in the Fall of 2013
- Funding for this project came from the Pacific Power's Blue Sky renewable energy program. This project is a partnership between Obsidian Renewables, LLC; Lake County 4H; Lake County School District #7; and LCRI
- Obsidian has donated the land adjacent to Lakeview Solar project for the new facility housing animals for the 4H program
- The 10kW array meets the electrical needs of the facility, keeping costs of operating the facility low
- Unlike the surrounding solar arrays, this installation is a fixed axis system
- The system generates approximately 13,000 kilowatt hours annually

Data from the three smaller arrays described above is monitored and fed to viewing screens at the High School so that students can study and compare the differing outputs between the three systems.

Live monitoring for the Lakeview 4H and FFA Farm can be seen by clicking [here](#)

## Residential

Homes use a lot of energy. From heating in the winter and cooling in the summer a typical home in Lake County can average close to \$200 a month in electric and oil bills. As world demand for electricity and oil increase, we can only expect the costs of these fuel sources to rise. Fortunately, with state and federal assistance, we can make low cost investments into renewable energy systems that will provide our homes with low cost heating and cooling for decades to come. Below are short descriptions of the renewable energy systems LCRI can help you install in your home. Please contact us to learn more about how we can help you make an investment in renewable energy that will pay off for years to come.

### Residential Options

Ground Source Heat Pumps



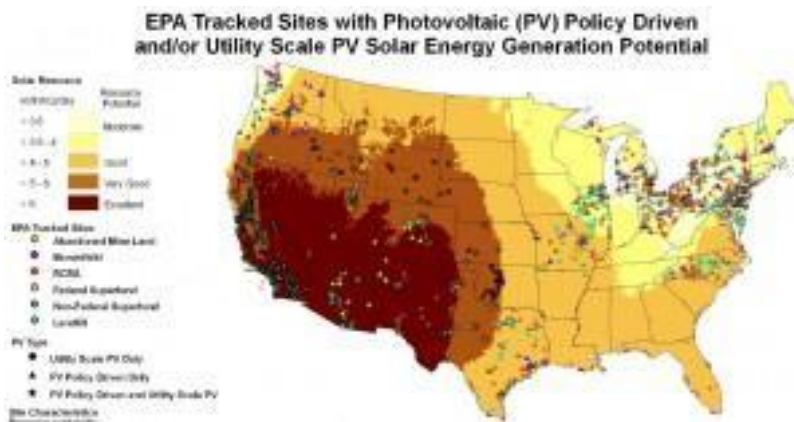
Five feet down – trench for a ground source heat pump

The constant bombardment of the Earth's crusts by the Sun's warm rays makes the ground a reliable source of warm. This is particularly true if you dig five feet down.

At a depth of five feet the Earth's crust almost always has a temperature of 55 degrees Fahrenheit, even in the coldest of winters. Ground source heat pumps put this reliable heat to use heating and cooling homes often with 75% less electricity than a conventional electric system. By circulating a type of antifreeze through pipes buried five feet down, a ground source heat pump can both heat and cool a home. During the winter the ground source heat pump draws the warmth out of the soil and transfers it to the home through heat exchangers that keep the anti-freeze separate from the heating system. Those same heat exchangers allow the ground source heat pump to cool a home in the summer.

The upfront price of a ground source heat pump ranges from \$8,000 to \$16,000 depending on the amount of trenching work you can do yourself. With state and federal rebates, an excellent price when one considers ground source heat pumps provide very comfortable heat (heat evenly throughout a home and heat that won't dry out your skin), and once the system is paid off in several years, you might expect to see hundreds of extra dollars in your bank every year.

## Solar Panels and Heat Collectors



Lake County receives ample sunlight

Just as the sun rays warmth the Earth's surface so too can they heat your water and even provide your home with electricity. Lake County, Oregon is among the best places in the U.S. for solar applications. As the EPA map shows on the right, the county receives on average 5 to 6 kilowatt hours (kWh) per square meter a day. According to Pacific Power, one of the county's principle electricity providers, the average residence in Lake County consumes 33.5 kWh a day, meaning that it would only take 7 square meters of roof top to meet the average home's electrical needs with solar photovoltaic panels.

The high solar incidence (amount of energy falling on a flat surface) of Lake County allows us to heat our homes with solar energy too. With the use of low-, medium-, and high-temperature solar collectors, any homeowner can capture the heat of the Sun and redirect it toward heating his/her home. The state of Oregon mandates that all public owned utilities operating in Oregon provide their customers with financial assistance in purchasing renewable energy. That means the Pacific Power customers of Lake County are in a particularly good position to purchase solar systems.

## Photovoltaic Panels



Rooftop solar panels

The Sun's rays are high charmed beams of electromagnetic radiation, also known as photons. Photovoltaic panels generate electricity by placing materials with loosely attached electrons (monocrystalline silicon, polycrystalline silicon, amorphous silicon, etc) in direct opposition to incoming sunlight. The sunlight then knocks the electrons loose and allows the photovoltaic panels to channel those electrons into batteries or into powering household appliances like light bulbs and refrigerators.

According to **Energy Trust of Oregon**, solar panels could cost as low as \$1,875 and could generate \$410 a year for Pacific Power customers. That's a 21% annual return on investment, not bad considering the stock market rarely returns more than 10% a year. Click [here](#) to learn more.

## Solar Hot Water



Solar hot water system

Just as the sun can produce electricity so can it produce heat. A great way to put the sun's warmth to use is a solar hot water system. Solar heating systems can be used to heat water, a home and even swimming pools. The costs of these systems range from \$2,000 to \$4,000 and will provide a annual return on investment between 6% to 25% (**US Department of Energy**). The **Energy Trust of Oregon** has some great information on solar heating systems and their financial incentives. And of course, LCRI is here to answer any questions you might have as well.

## Wind



Wind and Solar

Patty and Keith Barnhart, owners of the **Willow Springs Guest Ranch**, are very pleased with their small wind generator. Through their wind generator and solar panels their ranch is able to operate completely off the electrical grid. The Barnharts find that the solar and wind combination works really well. From their experience, their plenty of wind to power their batteries on cloudy days and plenty of sun to power their batteries on clear days.

Unfortunately, wind power can't be generated in as many locations as solar power. The sun reaches almost every square meter of Lake County, but the wind only consistently blows through a few areas in Lake County. Please arrange an appointment with our engineer to find out if wind is right for your home. Also, here's some great information the Energy Trust of Oregon has put together on **small wind**.

## Energy Efficiency Measures

Before you invest in an alternative energy system in your residence, the first action you should take is to make your home as energy efficient as possible. This is by far the cheapest action you can take to achieve direct cost savings, reduce greenhouse gas emissions, and increase the overall comfort of your home. These activities may include things such as installing energy conservation and weatherization measures (door sweeps, outlet covers, window plastic), conducting energy assessments, helping to design, install and maintain a variety of sustainable systems.

A few things you can do:

- Order a free home weatherization kit courtesy of **Energy Trust of Oregon**. By installing insulating plastic on your windows, sweeps on your doors, and outlet covers. You can better keep your house warm in the winter!
- If you feel that you might have greater weatherization needs, such as foam insulation please see if you qualify for the **OHDC Weatherization Program** services. For more information, please contact:
  - **Jim Minix**, Program Director of the OHDC Weatherization Program, (541) 883-7186