



## Alternative, Renewable and Bio-Energy

Southern Alberta has invested in renewable energy sources including wind, biofuels, methane conversion (through bio-digesters), and solar. Renewable energy is 16.9% of Canada's total primary energy supply. Hydro (59%), wind (1.6%) and biomass (1.4%) are the three largest sources of Canada's electricity generation.

In 2013, The Climate Change and Emissions Management (CCEMC) Corporation supported eight Alberta projects and provided \$46 million in funding. These projects had a combined value of nearly \$390 million and will reduce greenhouse gas emissions by more than five megatonnes over the next 10 years.

Southern Alberta is a region that truly understands the value of its natural resources. Industry and community work together to maximize and capitalize on what is available within the local environment and to maintain a sustainable and renewable approach to resources.

Lethbridge College is the only postsecondary institution in Canada approved to deliver BZEE certified wind turbine training programs (the current world standard).

Some examples of this philosophy are provided below:

- Lethbridge has the highest number of green certified homes per capita in Canada and is home to one of Canada's first built green residential community and first Energy Star rated community.
- The City of Lethbridge recycles more than over 50,000 kilograms of metal each year.
- Park Place Mall received the BOMA BEST level 4 environmental award, the highest rating for green efforts, and is the second shopping mall in all of Canada to receive this rating without investing in renovations.

### **Wind Energy**

Considered to be the birthplace of Canada's wind industry; the first commercial wind farm was built in Southwest Alberta in 1993. Presently there are 532 turbines generating 1,086 megawatts of energy capacity, with another \$1.2 billion in wind energy projects planned or proposed in the region that will potentially double capacity over the next several years. There is also a robust network of companies in place to service and support these wind farms. Currently at 95% completion, the Blackspring Ridge Wind renewable energy project represents the largest investment in wind energy in Western Canada, with 166 turbines expected to generate 300 megawatts of energy – this one project is enough to power 140,000 homes.

Due to the force of wind from the mountains, technology to measure wind velocity was developed in southern Alberta, and is now sold around the world. These advancements in monitoring wind and in the oil and gas sector could potentially be developed through international partnerships.

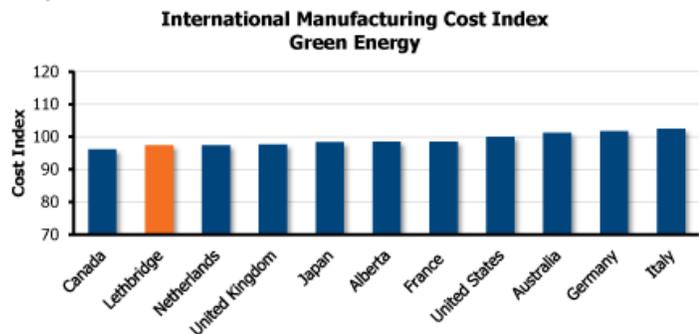
Businesses benefit from a highly skilled and specialized workforce to operate their valuable wind and alternative energy assets. Training is available through the Lethbridge College International Wind Energy Academy and a number of other alternative energy programs and includes hands-on experience with relevant equipment. This is just one of many reasons why the Southern Alberta/Lethbridge region is one of the most competitive environments in the world in which to produce green energy (See: *Figure D.19.KPMG Competitive Alternatives Study 2014*).

### Solar Energy

Alberta has the potential to be a world leader in the supply of solar energy. Receiving 2,300 hours of sunshine on average per year offers an advantageous location for the solar industry in Canada. Taking advantage of this is the Town of Vulcan, who is currently building a “Solar Park” which is the first of its kind in Canada, and will be based on the concepts of energy efficiency, aesthetics, and energy production.

This industry provides multiple opportunities including the expansion of a manufacturing industry for solar equipment, developing solar farms to supply electricity to the power grid, or partnering with a research group to commercialize a breakthrough technology.

Figure D.19



As the cost of traditional electricity increases and the technologies of solar energy evolve, it is inevitable that solar energy businesses will start, grow and prosper in the Southern Alberta region.

Source: *Competitive Alternatives: KPMG's Guide to International Business Location, 2014 Edition.*

### **Bio-Fuel**

While Oil & Gas is an \$80 billion industry in Canada, southern Alberta is making a mark with a variety of renewable energy assets. Over the past 15 years, the renewable fuels industry in Canada has grown exponentially and Lethbridge is creating a strong sector in this region. There are \$2.3 billion of renewable fuel production facilities in Canada. These facilities have the capacity to produce two billion liters per year of ethanol and bio-diesel which is just 2% of global production. This profiles the tremendous opportunity for growth and Lethbridge is well-positioned to be a major player in building this sector.

Bio-fuel plants produce either bio-ethanol or bio-diesel used as fuel additives for purposes of reducing emissions. Southern Alberta is home to the largest biodiesel plant in Canada. This facility can produce 66 million litres of biofuel a year.

### **Bio-Energy (Biomass)**

Bio-energy, scientifically referred to as biomass, turns plant material and animal waste into energy, and is the oldest source of renewable energy on the planet. Until recently, biomass supplied far more renewable electricity—or “biopower”—than wind and solar power combined. (*Energy Information Administration, 2008*).

Bio-energy provides multiple environmental benefits, including the reduction of air pollution and carbon emissions. This energy source is often a by-product of agriculture, such as animal waste, corn stalks and spoiled produce. Crops for bio-energy can also be grown and harvested in ways that protect the quality of the soil, avoid soil erosion, and maintain habitats for wildlife. With a growing bio-energy industry, farmers in Southern Alberta benefit from a new revenue stream, or cost offset, from their crop residues, as well as having the opportunity to grow new energy crops – all while reducing emissions by creating renewable energy. ([www.ucsusa.org](http://www.ucsusa.org))

Southern Alberta is home to two bio-energy facilities and combined they produce more than 4.2 megawatts of energy per year.

- **Lethbridge BioGas** is a \$30 million facility with a generating capacity of 2.8 megawatts of power (enough energy to power 2,800 homes). With the addition of new generating units, it has the future capacity to produce up to 4.2 megawatts. Lethbridge BioGas is the first facility in Canada to incorporate patented thermal hydrolysis technology, approved by the Canadian Food Inspection Agency, for the destruction of prions that cause BSE in cattle.
- **GrowTEC (Grow The Energy Circle)** received \$3.5 million in funding from Climate Change and Emissions Management (CCEMC) to develop a multi-faceted bio-energy venture. This \$8 million facility will offset 10,400 CO<sup>2</sup> on an annual basis. The anaerobic biodigester converts 25,000 tonnes of organic waste per year to produce more than enough energy to power operations on a third-generation potato farm, with excess being supplied back to the grid.



For more information please feel free to contact any one of the economic development professionals as listed below:



[www.albertasouthwest.com](http://www.albertasouthwest.com)

**Bev Thornton**  
Executive Director

403.627.3373  
[info@albertasouthwest.com](mailto:info@albertasouthwest.com)



[www.lethcounty.ca](http://www.lethcounty.ca)

**Martin Ebel**  
Economic Development  
Officer

403.328.5525  
[mebel@lethcounty.ca](mailto:mebel@lethcounty.ca)



[www.chooselethbridge.ca](http://www.chooselethbridge.ca)

**Heather McIntosh-Rivera**  
Business Development  
Director

403.331.0022  
[heather@chooselethbridge.ca](mailto:heather@chooselethbridge.ca)



[www.southgrow.com](http://www.southgrow.com)

**Pete Lovering**  
Manager

403.394.0615  
[pete.lovering@southgrow.com](mailto:pete.lovering@southgrow.com)

