

# WELCOME



*Serving Our Community*

**Historic Small Town, based in resource industry moves to sustainable sources of energy to offset GHG and Cost**



## INTRODUCTION

- Utility Management
- Alternative Energy
- Green Fund
- Savings

## Utility Management

- **Oilfields Regional Arena Projects undertaken**
  - Lighting retrofit, Low E Ceiling, insulation, night setback thermostats.
- Refrigeration system modifications, power factor correction, power cleaning, low flow toilets, shower modifications, energy management system, equipment upgrades, staff behavioral modifications, recycled plastic benches & picnic tables, tree planting program.

## Alternative Energy

➤ Black Diamond's Corporate Vision is: We value sustainability and promote a safe, clean and healthy environment. We strive to develop and maintain effective partnerships within our organization and with surrounding communities. We are open, effective and responsible to our citizens. We encourage ongoing education for all members of our organization, and work together for a common goal. We value the diverse beliefs and opinions of our community. Through active leadership, we constantly strive to improve service to our citizens.

## Alternative Energy

What this means to us is we will pursue efficiencies in our operation that will also help with the environmental impact. What we do today will determine the outcome for future generations. The benefits to alternative energy is - what is produced can be used on site with out paying for distribution fees, it helps reduce operating costs. It is not a quick payback but it starts paying back instantly, and helps lower our carbon footprint.

## Alternative Energy

The first involvement in alternative energy was a 1.82 kilowatt Solar system at the hockey arena in 2007 with the Alberta Solar Municipal Showcase. The next was a vertical axis wind turbine (demonstration project) then a regular wind turbine and now we also have a second solar system which was just upgraded to 4.86 kilowatts. The third project was the installation of a 4.83 kilowatt reflector solar system on the Town office. The fourth project was a 10 kilowatt solar system on the Arena roof.

## Alternative Energy



Solar panels on Roof of Arena

## Alternative Energy



Vertical Axis Wind Turbine

## Alternative Energy



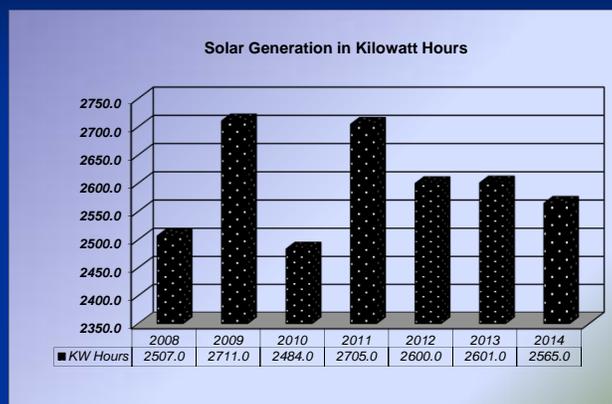
Regular style wind turbine

## Alternative Energy



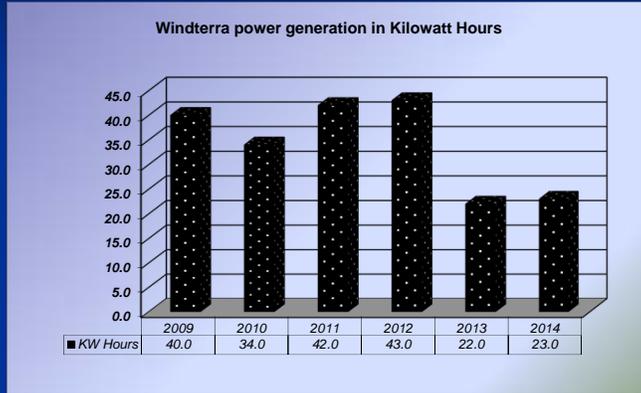
Reflector Solar System on Town Office

## Alternative Energy



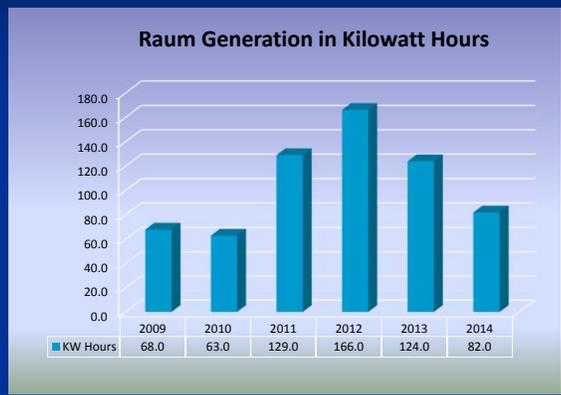
First Solar System Annual Production

## Alternative Energy



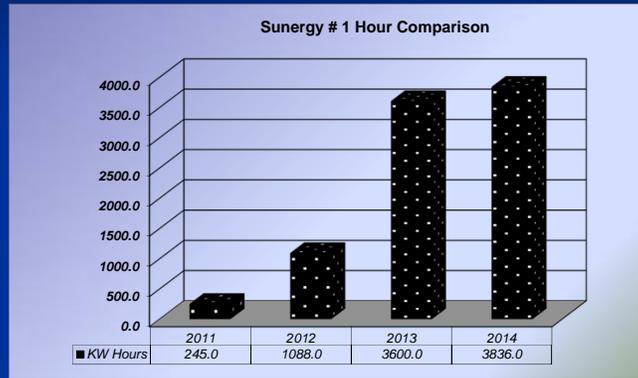
Vertical Axis wind turbine Annual Production

## Alternative Energy



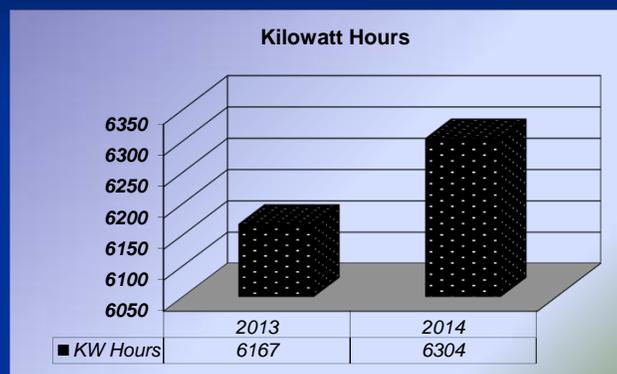
Regular style wind turbine Annual Production

## Alternative Energy



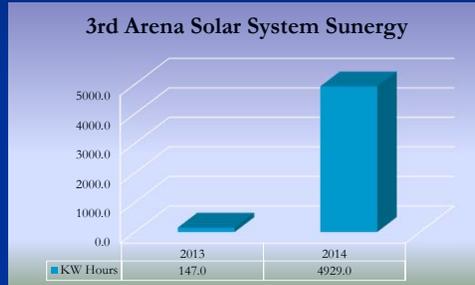
2<sup>nd</sup> Solar System Production, 2011 1.41 kw, end of 2012 expanded to 4.83kw

## Alternative Energy



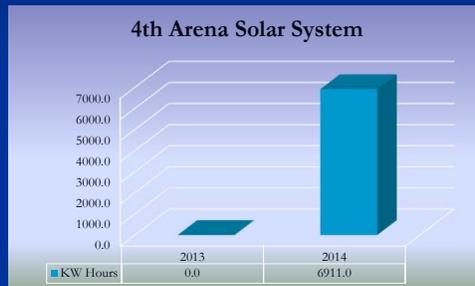
Town Office Reflector system annual Production

## Alternative Energy



3rd solar system annual production  
5 kilowatts system

## Alternative Energy



4th solar system annual production  
5 kilowatts system

## Alternative Energy

- When we had our solar systems installed, one of the items we looked at was making the systems adjustable. This was done on the first 2 solar systems, the angle is changed twice per year. We track our production daily to make sure the systems are working plus we track other systems so we can compare how it is working. The original solar system is compared to the others in the Alberta Solar municipal showcase. In the last four years we have out produced all other systems annually per kilowatt of system.

## Green Fund

- In 2008 a green reserve fund policy was developed, the purpose was to build reserves for green projects. A green project is one that will assist with sustainability and will result in a reduction of operating costs and one of the following: greenhouse gas emissions, consumption of natural resources, water consumption or waste materials.
- Our definition of sustainability means: making human economic systems last longer & have less impact on ecological systems

## Green Fund

- How it works – any project that reduces the cost of operation and meets the definition of a green project is eligible. That department will budget for utility costs as if the project had never taken place. The money that is saved each fiscal year from that project is placed in reserves to fund additional green projects.
- For the 2013 Arena solar expansion \$10,500.00 was used from the green fund towards the project. Savings going into the green fund in 2015 are estimated at \$8,835.00

## Green Fund

- From the initial installation of alternative energy to the end of July 2015 – 77,306 kilowatt hours of electricity has been generated which equates to a reduction 53.3 metric tons of green house gasses  
  
The Alternative energy, retrofits and energy management system have saved 506 metric tons of green house gasses.

## Savings

- What are the savings? Some of the savings are not easily calculated, power factor correction & power cleaning improve the operation of electrical equipment this helps the equipment operate cooler with consistent power – extending its life. Extending the equipment's life also saves us money.

## Savings

- By making your equipment operate more effectively, you can also reduce its maintenance costs. Alternative energy – if produced during the highest usage periods can have an effect on your electrical demand, if you lower this part of your bill (included as part of the distribution fees) it will effect you annually.

## Savings

If we had not undertaken projects at the arena the difference in our power bill from 2004 to 2014 is estimated to have cost us an additional \$28,554.00 for the electricity without distribution & transmission fees.

Some of the savings have been identified, lighting retrofits from 1997 to 2014 have saved \$19,657.00, water reduction has save \$17,148.00, furnace & water heater replacements have saved \$5,562.00 in natural gas, Energy Management system has saved \$5,250.00, reduced maintenance costs \$11,000.00 - trackable savings to date is over \$86,000.00

## Savings

There are all the items that are not so easily tracked, reduced call outs by electricians, plumbers and mechanics. Equipment lasts longer with fewer repairs, life of the building extended. The arena operates now for 8 months and uses less electricity, natural gas and water compared to what it use to take to operate 7 months. In the last 18 years we have had one breakdown on the refrigeration system that lost 1 day of ice rentals. Some of the projects do not pay back in 5 years, but in the lifetime of the upgrade it will save its replacement cost 2 to 5 times. These savings can far exceed the trackable savings.

## Summary

Start with the simple things, staff behavior modification, then look at what items you have that can be modified to reduce power, gas & water consumption. Insulation, thermostats, when equipment operates, how it operates, why it operates, automate so it is only used when required. Don't only look at the quick payback items, look at longer payback items, once you have reduced utility consumption look at alternative energy. The entire time you need to record the results then compare annually.

## Questions?

On behalf of the Town of Black Diamond, we'd like to thank all of you for your time and your attendance. We can only be stronger and more effective by sharing information and working together. What we work on today will benefit future generations.

For additional Information please feel free to contact Les Quinton 403-933-5272 or [orarena@persona.ca](mailto:orarena@persona.ca)