Renewable Energy Systems Overview
Company Background

- Company started in 2005
- Headquartered in Courtenay, BC
  - Serve Southwest British Columbia
- LEED Accredited and C.E.M. Professionals
Conservation Vs. Generation

High Efficiency Washer
244 kWh/year
$1500

Top Load Washer
950 kWh/year
$500

Cost of solar system to generate 706 kWh/year = $3000!
Solar

- Photovoltaic
- Solar Thermal
Do We Get Enough Sun?

Average Daily Solar Insolation

- Miami
- Vancouver
- Munich

kWh/m² per day

January  February  March  April  May  June  July  August  September  October  November  December  Average
Does Solar Work in BC?

- Average annual insolation in Vancouver is *only 8% less* than Miami.

- Germany has the *second highest implementation rate* of Solar Thermal and Solar Photovoltaic in the world.

- In B.C. we can get *40-60%* of our annual hot water needs from Solar.

Image ©Klaus Leidorf http://www.flickr.com/photos/leidorf/5472999582/
Solar Thermal

- A technology for harnessing solar energy for heat
- Ideal as a preheating system for Domestic Hot Water
- Can be married with other renewable energy technologies
How Solar Collectors Work

Flat Plate Collector

Evacuated Tube Collector
How Solar Thermal Works

SOLAR HOT WATER

domestic hot water loads

carbon collectors

backup boiler

solar pump station & controller

solar storage tank with double walled heat exchanger
What Solar Thermal Looks Like
Self Assessment

- Do You Have Room for a Solar Storage Tank?
- Do You Have an Unobstructed South Facing Roof in Good Repair?
- Is There an Adequate “Chase” For the Solar Piping?
- Does Your Household or Business Use A lot of Hot Water?
Reliability / Maintenance

- Typically Only One Moving Part
- Glycol Flush and Recharge
- 10 Year Warranties
- Established Technology
- System Longevity
Photovoltaics (Solar PV)

- A technology used for creating electricity using sun’s energy
- Grid Tie: Used to supplement electricity consumption
- Off Grid: Used to charge a battery bank
- Typically rack mounted
How Solar PV Works

Sun Light

(Flow of Electrons)

(LOAD)
Solar PV Grid Tie System
What Solar PV Looks Like
Self Assessment

- Do You Know Your Annual Average Electricity Consumption?
- Do You Have an Unobstructed South Facing Roof in Good Repair?
- Do You Have Adequate Wall Space Available Near the Electrical Panel?
- How Much Energy Do You Want to Offset?
Reliability / Maintenance

- 25 Year Warranties
- Module Cleaning
- Resilient to Falling Debris
- System Longevity
Wind Turbines

- A technology used to create electricity using wind’s energy
- Grid Tie: Used to supplement electricity consumption
- Off Grid: Used to charge a battery bank
- Typically tower mounted
How Wind Turbines Work
Wind Turbine Grid Tie System
What Wind Turbines Looks Like
Self Assessment

Does Your Site Have Above Average Annual Wind Speeds?

Is Your Site Free From Turbulent Winds Caused By Adjacent Obstacles?

Is Your Site Limited By Height, Zoning or Spatial Restrictions?

How Much Energy Do You Want to Offset?
Reliability / Maintenance

- Annual Visual Inspections
- Bolt Tightening
- 10 Year Warranties
- Preventative Maintenance
Microhydro

- Technology to create electricity using energy of falling water
- Grid Tie: Used to supplement electricity consumption
- Off Grid: Used to charge a battery bank
How Microhydro Turbines Work
Microhydro Grid Tie System
What Microhydro Looks Like
Self Assessment

Do You Have an Appropriate Non-Fish Bearing Water Source?

Is the Water Source Reliable and a Reasonable Distance From Your Home?

Have You Calculated the Flow or Head of the Potential Water Source?

How Much Energy Do You Want to Offset?
Reliability / Maintenance

- Regular Visual Inspections
- Cleaning Intakes
- 2 Year Warranties on Turbines
- Preventative Maintenance
Geo-Exchange

- A technology that uses the earth’s constant temperature to generate heat
- Makes use of a heat pump to get desired temperature
- Geo-Exchange systems can be used for space heating, space cooling, or domestic hot water production
Types of Loops

- Open Loop
  - Pond
  - Well

- Closed Loop
  - Vertical
  - Horizontal
  - Body of Water
How Geo-Exchange Works
Types of Heating Systems

- Forced Air Heating
- Hydronic
  - Low Heat: Radiant
  - Hydronic
  - High Heat: Radiators
Self Assessment

- Do You Have a Large Open Area or Water Source?
- Do You Currently Have a Forced Air or Hydronic Heating System?
- Do You Have Room in Your Mechanical Room for a Heat Pump and Associated Components?
Reliability / Maintenance

- Typical warranties are 5 - 10 years
- Distribution and System Checks
- Monitoring Options
- Heat Pumps Will Last 15 - 20 Years
Biomass

- Using organic material as a heating source
- For residential biomass systems this fuel source is typically logs, woodchips or wood pellets
- Biomass systems can be used for space heating, domestic hot water production, or both.
Types of Heating Systems

- Biomass Forced Air Furnace
- Hydronic Biomass Boiler
- Biomass Stoves
Self Assessment

- Do You Currently Have a Forced Air or Hydronic Heating System?
- Do You Have Room in Your Mechanical Room for a Wood Boiler and Associated Components?
- Are You Prepared for Labour and Maintenance Required to Own and Operate a Biomass Heating System?
Reliability / Maintenance

- Clean Ash Box / Sweep Chimney
- Source is only as good as supply
- Typical warranties are 5 - 10 years
- Distribution and System Checks
Why Use Renewables?

- Long Term Energy Security
- Home Rating Systems
- Non-polluting Clean Energy
- GHG Reduction
- It’s the Right Thing To Do
Your Gateway to Green Energy

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