

## Green Energy

### Independent Power Production in BC



#### Where It Started.

- The Independent Power Producers Association of British Columbia was formed in 1992, shortly after the first private power projects in British Columbia were proposed.
- There are 45 operating IPPs in British Columbia generating approximately 5,100 gigawatt hours (GWh) per year of clean energy, which is equivalent to 9% of BC's annual electricity consumption.
- IPPBC members are varied and represent a varied type of energy generation including run-of-river, wind, biomass and geothermal. The potential for solar, wave and tidal energy also is being researched.
- IPPBC members are committed to energy development in an environmentally sustainable manner, working with local communities, First Nations and government.
- Like conventional natural resources, British Columbia is endowed with an abundance of renewable resources and the province has an opportunity to lead the nation in producing green energy. IPPs are helping to put the province at the forefront of clean energy generation and technology.

#### Run-of-River Hydro

- Currently, there are 35 run-of-river hydro projects operating in BC and a dozen under construction.
- BC's mountainous topography and climate along with its extensive waterways presents numerous opportunities for run-of-river development in many areas of the province.
- Run-of-river hydro uses the natural flow and elevation drop of a river to generate electricity without the need for dams or water storage. A portion of the water from a fast-moving river is diverted into a penstock or pipe that channels it to a turbine, then back to the river, leaving enough of the waterway's existing flow so environmental values are protected.
- Of the Water License Applications for Power-General; over 50% are for projects under 10 MW and less than 5% are for projects over 50 MW.

#### Wind Power

- Twenty-five companies are pursuing wind power projects in BC. Two wind projects are currently under construction in the Peace region, with the first large scale, wind-generated electricity expected to come on-line in late 2008.
- Wind power is a clean, reliable, renewable, cost competitive source of renewable energy that has been used for decades. A single modern wind turbine can generate up to three megawatts of electricity and is 200 times more efficient than just two decades ago.
- BC has one of the best wind resource climates in Canada - particularly on northern Vancouver Island, the North Coast, the Peace region, and the southern and eastern Interior/Okanagan where wind energy prefeasibility studies are underway. Canada's first offshore project is planned for BC's north coast.

#### Biomass Power

- Biomass generation is the creation of bioenergy (heat and/or power) from wood or wood residues, agricultural food and feed crop residues, aquatic plants, animal wastes, and dedicated agricultural energy crops and tree farms.pbc.com
- The technologies utilized to create bioenergy include combustion, gasification, pyrolysis, digestion and gas collection. These technologies are considered to be carbon neutral due to the short processing cycle involved, combined with the regeneration of carbon through replanting.



Wherever possible, local technical people are hired for projects.



IPP projects are closely monitored prior, during and following construction.



- Bioenergy production in BC is limited to wood and wood residues, as well as landfill gas collection. Over 600 MW of capacity is currently in operation in the province at large pulp and paper facilities (largely self-generation). There are four operating biomass IPPs in BC with a total generating capacity of 96 MW.
- Future woody biomass sources in the province include existing mill wood residues, roadside debris and standing bug kill. Generation potential for existing mill residue is in excess of 200 MW. The total generation potential for all wood sources is in the order of 2,300 MW.

## Geothermal Power

- Geothermal power is renewable form of energy utilizing underground hot water or steam created by the natural heat beneath the earth's surface.
- Low temperature geothermal sources can be utilized to heat and cool residential and commercial buildings by installing heat pump systems. Hot water or steam from high temperature geothermal sources can be used to power turbines to produce, clean, renewable electrical energy.
- BC Hydro has identified 16 prospective geothermal sites in the province, of which the six most likely prospects collectively have an estimated geothermal potential of over 1,000 MW. All BC prospects are "hydrothermal" -- i.e. hot water rather than steam.
- The best prospect for immediate development in BC is the South Meager Geothermal Project located 55 km north of Pemberton with a potential generating capacity of up to 100 MW. A resource confirmation program currently is underway at the project site on Mount Meager.

## The Need for Green Power in BC

- The BC Energy Plan mandates:
  - Energy self-sufficiency by 2016,
  - 90% of total generation will be from clean or renewable energy sources.
- Despite all of the province's resources there is a substantial energy gap. For the past six years, BC has been a net importer of power from other jurisdictions like Alberta and the U.S. that rely heavily on carbon-intensive fuel sources like coal and natural gas.
- The BC government is encouraging the development of renewable power generation sources in the province for several reasons:
  - Eliminate greenhouse gas emissions
  - Meet the province's growing energy needs in a sustainable manner
  - Reduce our reliance on imported, carbon-intensive, non-renewable energy.
- By encouraging competition in the marketplace, renewable energy development will stimulate economic activity, creating jobs and opportunities for British Columbians.
- Building clean electricity projects that have a small environmental footprint will reduce the need to import energy, increase the reliability of our electricity supply, and reduce our exposure to external price risks.

## IPPs: A Smaller Environmental Impact

- Run-of-river hydropower, wind, geothermal, biomass and other renewables such as solar, wave and tidal energy are the most plentiful, environmentally sound renewable energy sources available in BC
- IPPs work closely with and involve local communities during the planning process, ensuring responsible development of natural resources that benefit each community while providing clean energy for all British Columbians.
- Renewable energy developments and result in improved local air quality as they replace fossil fuel sources of electrical generation.
- Most IPPs have a small ecological footprint and minimal visual impact.
- IPPs help diversify BC's energy mix providing a cleaner way to generate power and increasing the security of our energy supply.
- Greater availability of non-polluting renewables will help mitigate environmental impacts of energy use, now and for years to come.

### Key Links:

#### Environmental Assessment Office:

[www.eao.gov.bc.ca](http://www.eao.gov.bc.ca)

#### BC Hydro:

[www.bchydro.com/info](http://www.bchydro.com/info)

#### BC Utilities Commission:

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

#### BC Ministry of Energy, Mines and Petroleum Resources:

[www.gov.bc.ca/empr](http://www.gov.bc.ca/empr)

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