

AESO 2012 Long-term Outlook



Table of Contents

Appendix D, Solar Long Term Outlook.....	P.106
Figure 2: Solar Resources in Canada: Potential Solar Energy.....	P.107

All other sections of this document have been removed, for reader convenience.

A complete copy of the AESO 2012 Long-term Outlook Report can be downloaded from:

http://www.aeso.ca/downloads/AESO_2012_Long-term_Outlook_bookmarked.pdf

Solar

There are a number of solar energy technologies being used to produce electricity. Conventional photovoltaic (PV) produces electricity from direct sunlight. Concentrated photovoltaic (CPV) systems use mirrors and a tracking system to capture a large area of sunlight. CPV systems can be thought of as “telescopes”, trained on the sun’s position and feeding concentrated light to the cell to produce electricity. Solar thermal energy systems are similar to CPV, but instead concentrate sunlight using parabolic trough collectors to generate steam to power a generator that produces electricity.

In recent years, the United States government has provided significant incentives to the renewable energy industry. As the industry matures, manufacturers are reducing costs by implementing techniques such as modularization, pre-assembly, standardization, and automation.⁴⁵ The costs of photovoltaic panels have dropped dramatically over the past six years, leading to a drop in the levelized cost of electricity from \$400/MWh to \$200/MWh.⁴⁶ This brings the cost of solar much closer to a level that is competitive with other technologies. This reduction in cost can be attributed, in part, to dramatic reductions in the price of PV modules as well as the “balance of system” costs which include wires, switches, inverters and labor.⁴⁷

With a semi-arid climate and approximately 2,500 hours of sunshine per year, the southeast corner of Alberta receives more hours of sunshine than the rest of Canada. Moderate weather and Chinook winds that descend from the eastern slopes of the Rocky Mountains provide this region of the province with strong solar energy resources. Figure 2 shows the solar resources in the province, relative to the rest of Canada.

Currently in Alberta, solar generation is limited to small PV installations on residential and commercial buildings, all non-utility scale. However, several initiatives have begun in the province, including:

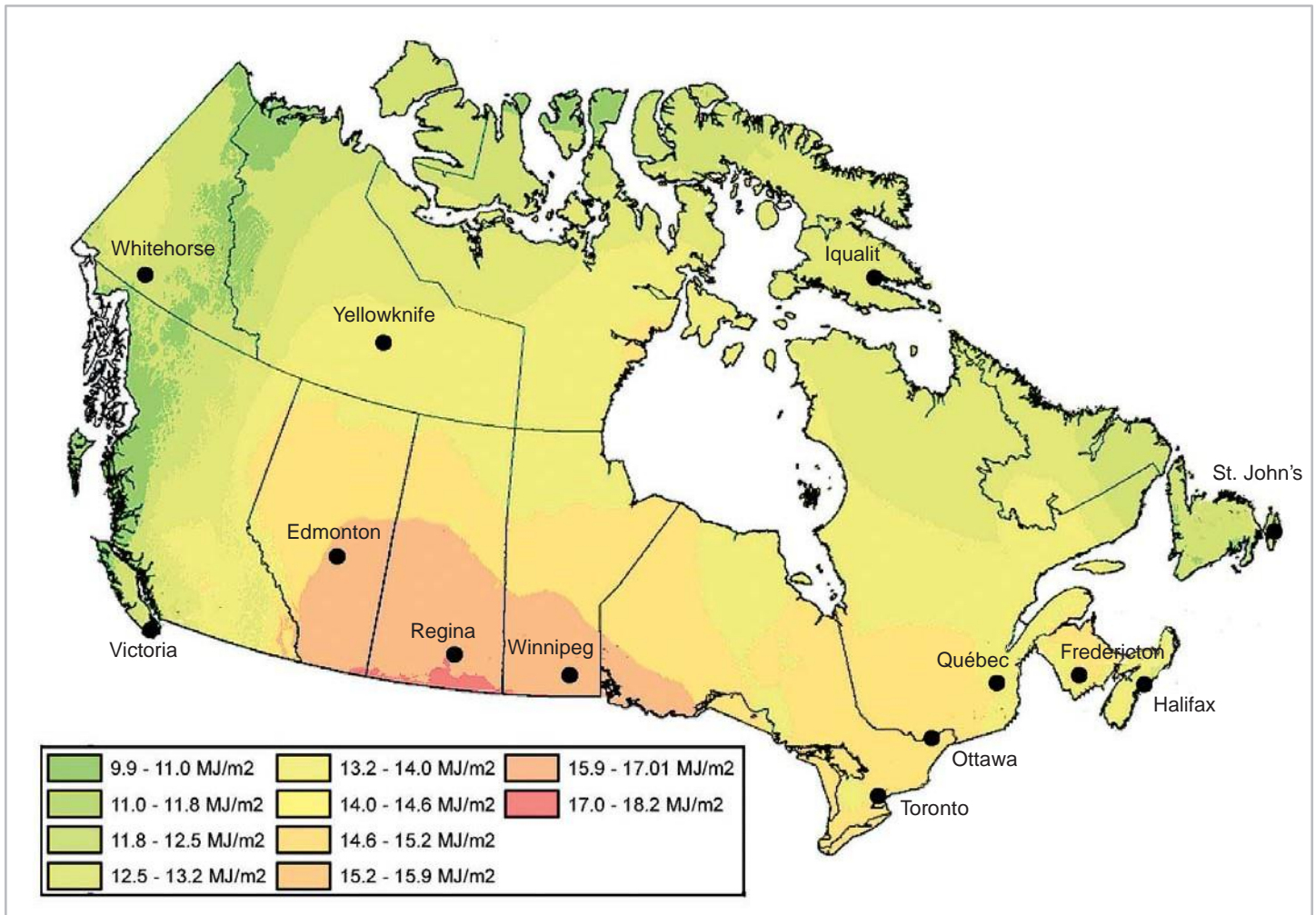
- ENMAX Energy has recently launched a Home Solar Program which provides residents the opportunity to install solar panels on their home. The initiative received \$14.5 million from the Climate Change Emissions Management Corporation.
- The City of Medicine Hat is in the process of developing a one MW demonstration concentrating solar thermal power project. This project is the first of its kind in Canada and will provide energy for approximately 175 homes. The project has received funding agreements from the City of Medicine Hat, Alberta Environment and the Climate Change Emissions Management Corporation totaling \$9 million.
- GTE Power recently announced plans to develop a 15 MW solar power facility near Brooks, Alberta. The company is currently exploring various technology options including, dual axis tracking and fixed axis systems. The facility is expected to generate 34,000 MWh per year. The solar power facility has an expected service life of 20 years, with opportunities to upgrade as new technologies emerge, potentially extending the life of the project. GTE Power has proposed similar projects in Ontario. The Brooks Solar Power Plant is in the early stages of development.

⁴⁵ McKinsey on Sustainability & Resource Productivity. *Solar Power: Darkest before Dawn*, McKinsey & Company, May 2012

⁴⁶ CERA, *North American Gas and Power Scenarios Workshop*, April 25, 2012

⁴⁷ Lawrence Berkley National Laboratory, *Tracking the Sun IV: A Historical Summary of the Installed Cost of Photovoltaics in the United States from 1998 to 2010*, September 2011

Figure 2: Solar Resources in Canada: Potential Solar Energy



Source: Natural Resources Canada

At this time no large installations (greater than 20 MW) of solar generation have been included in the 2012 LTO and scenarios. However, the AESO will continue to track solar developments in the province and cost evolution for photovoltaic projects.



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