Solar energy research and development canada

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In Canada, Photovoltaic (PV) technology has become a favoured form of renewable energy technology due to a number of social and economic factors, including the need to reduce greenhouse gas (GHG) emissions, deregulation, and the restructuring of electric power generating companies. The rapid growth in the deployment of photovoltaics in recent years indicates that the technology is quickly gaining ground in Canada.

Our primary mandate is to help develop and deploy photovoltaic energy technologies in Canada. To this end,two strategic approaches are being taken. The 1st is to accelerate the deployment ofsolar powerin Canada, while the 2nd aims at exploiting solar energy's potential, both nationally and internationally.

CanmetENERGY carries out work to provide stakeholders with the necessary information to make informed decisions. This includes the coordination of various research projects, participation in international committees on the establishment of photovoltaic standards, and producing information that will support capacity-building in Canada. Our team's work and research aim to generate knowledge and facilitate its communication to decision makers in Canada.

CanmetENERGY also actively contributes its expertise through innovative partnerships within the industry. Most research projects are carried out, on a cost-sharing basis, with industry, universities, research groups, quasi-public agencies, and other departments and governments. We share our expertise by participating in international committees on photovoltaics, participating in joint projects with industry, developing software to assist in feasibility studies, as well as developing information and training tools.

Westbridge Energy Corporation is a Canadian renewable energy company based in Vancouver, Canada, that develops utility-scale solar projects utilising storage and various other technologies to support its projects. Just recently, in early September, the company announced that its Georgetown Solar project in Alberta, Canada, had passed its environmental and wildlife field study programmes and preliminary layout engineering and design. Canada has hundreds of companies in its solar sector, but how suitable is the country really for solar power development?

Canada may seem to some as a fairly cold land that is not particularly suitable for solar power generation, but the country actually has substantial solar energy resources, due mostly to its large area. However, most of the prime areas are, understandably, in the southern part of the country, with the highest solar generation potential in the southern extremes of Alberta, Saskatchewan, and Ontario. The northern territories of Canada still have some solar potential, but a lot less than in the south.

Due to the country"s high latitude, Canada has an overall maximum capacity factor of 6 percent, compared to 15 percent in the United States. Despite this, the Canadian Energy Regulator previously anticipated that solar

would form 3 percent of the country"s overall energy generation by 2040. In fact, according to statistics released this year by the Canadian Renewable Energy Association (CanREA), Canada"s solar sector surpassed that figure in December 2020.

In 2009, Ontario assumed a leading position in Canada"s solar sector after introducing a Feed-in Tariff (FIT), which was the first of its kind in North America. This in turn enabled the province to develop a giant solar farm near Sarnia, which, at 97 MW, was the largest such facility in the world until surpassed by even larger solar farms in India and China.

However, Ontario has several other solar farms in operation, including the Arnprior Solar Generation Station (23.4 MW), constructed in 2009, which is scheduled for expansion to 80 MW, the Sault Ste Marie solar farm (68 MW), and the Kingston solar farm (100 MW) constructed in 2015. The province also has some concentrated solar power generation, although these are not eligible for the Feed-In Tariff, due to them not being fully proven in Ontario"s climate. Solar thermal generally is not very well represented in Canada.

The province of Alberta has seen tremendous growth in demand for solar Power Purchase Agreements (PPAs) from multinational corporate consumers including Amazon, Budweiser, and Grupo Bimbo. This year alone, corporate buyers have signed PPAs for over 540 MW of new utility-scale solar farms in Alberta. In terms of on-site (behind-the-meter) solar, we are seeing strong demand from a wide range of sectors across Canada, including residential, commercial, industrial and agricultural consumers.

According to the Canada Energy Regulator, the primary barrier to widespread solar power generation in Canada is cost. In 2016, this amounted to 23 cents per kWh, far greater than other renewable energy technologies such as wind. Incentives are therefore an important factor in encouraging development. Currently, most Canadian solar generation is located in Ontario, because of the FIT.

Alongside the FIT, which is only available for installations over 10 kW, Ontario operates a microFIT programme, aimed at encouraging microgeneration such as residential rooftop solar PV. However, there aren"t many residential rooftop arrays in Canada because they are generally unpopular, and in some of the provinces, such as Quebec and Ontario, a lot of electricity is generated with hydro and nuclear, thereby producing an abundance of non-fossil fuel electricity.