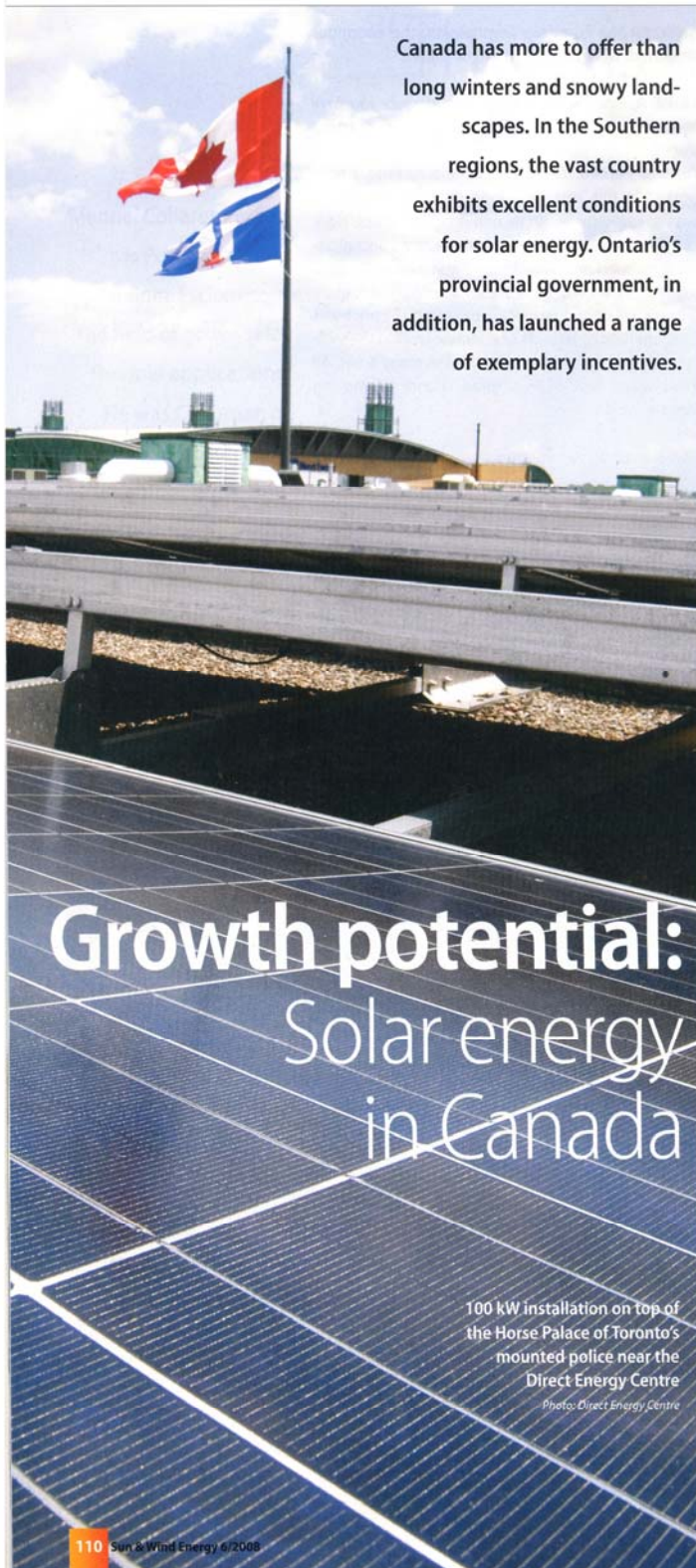


Sun & Wind Energy, 01/12/08, Growth potential: Solar energy in Canada, 110-114

**SOLAR ENERGY**



Canada has more to offer than long winters and snowy landscapes. In the Southern regions, the vast country exhibits excellent conditions for solar energy. Ontario's provincial government, in addition, has launched a range of exemplary incentives.

**Growth potential:  
Solar energy  
in Canada**

100 kW installation on top of the Horse Palace of Toronto's mounted police near the Direct Energy Centre  
*Photo: Direct Energy Centre*

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With its vast natural resources, the world's second largest country occupies a leading position among the energy producers and exporters. However, renewable energies have in the past had a rather marginal importance for the primary energy demand. Although hydro power delivers 60 % of the total of Canada's electricity production, the Canadian-German Chamber of Industry and Commerce (CGCIC) indicates that conventional sources such as oil, natural gas and coal still dominate the energy mix with around 70 %. Despite high percentages in the energy production, hydro power pays only 11 % into the energy mix and other alternative sources as little as 6 %.

But in the course of the past years, the sensibility for the influence of conventional energy production on the environment has risen in the public mind, reports Elizabeth McDonald, Director of the Canadian Solar Industry Association (CanSIA). Susanne Ritter, Director at CGCIC for Quebec and Eastern Canada, points to the industrial nation's growth: "Between 1990 and 2006, the energy demand increased by 24 %." In the opinion of McDonald, this opens a crucial growth opportunity for the small Canadian solar market. Due to high solar radiation levels, the average PV revenue in Canada amounts to 1,150 kWh per kW per year. Meanwhile, the federal and provincial governments have launched incentive schemes for the renewable energy sector. On the federal level, the ecoEnergy Program was introduced in April 2007 and is presently scheduled until March 2011. While the ecoEnergy Program for Renewable Power provides subsidies for clean electricity such as solar PV systems, the ecoEnergy Program for Renewable Heat has been designed as an incentive for solar thermal energy.

**Solar thermal energy growing**

Through the ecoEnergy Program for Renewable Heat, solar thermal systems in businesses, industry and institutions are subsidised with 25 % of the investment sum up to a limit of CAD 80,000 (US\$ 64,787.80). Until 2011, a number of around 700 installations will be able to obtain financial assistance. However, the incentive has been restricted to particular collector types in order to maintain the high standard of the installations. The collectors must, for example, meet the certification criteria of the Canadian Standards Association (CSA). But also for solar thermal on private houses, a long-term incentive has been arranged with an initial budget of CAD 9 million. The financial backing will enable 13 selected utilities, electricity suppliers and non-governmental organisations to launch pilot projects. Victoria Hollick, Vice President of the solar thermal manufacturer Conservall Engineering Inc. from Toronto and Vice President of CanSIA, welcomes the programme: "With the incentive, the solar thermal market received a real boost in the last year." Looking at other international markets, Canada still has a long way to go. According to the Science Applications International Corporation (SAIC), the total installed collector surface at the end of 2005 arrived at only 418,897 m<sup>2</sup>. It

comparison, Germany in the same year accomplished twice that amount. Victoria Hollick is still confident: "We believe that the developments are promising and hold an optimistic view. From what we expect, a total of 20 million m<sup>2</sup> of installations could be possible until 2025. The latest figures on Canada's installed capacities are not available yet. But especially the demand for glass evacuated tube and flat plate collectors has in the last years amplified."

### PV market – slow going

Other than the solar thermal industry, the PV market in Canada has only really emerged in the last two years. "Solar thermal air and water heating are technologies already more familiar to the Canadian public", said Hollick. The subsidy situation for PV is also worse. The federal incentive in the framework of the ecoEnergy Program for Renewable Power provides only 1 CAD-ct/kWh in a period of ten years for PV systems installed by corporations and institutions until 2011. According to CGCIC, the electricity prices for mid-sized customers currently range between 6 and 14 CAD-ct/kWh making it a challenge for PV electricity to become profitable. "Because of the federal and provincial incentives, air or water heating is simply subject to faster payback. Since solar thermal is two to three times as fast as PV, it should have the better market", explains Leonard Allen, President of the project company Solera Sustainable Energies Company Ltd. from Toronto. According to CanSIA, in fact only about 25 MW of PV systems were installed at the end of 2007. As a consequence of the poor incentives, the Canadian market is today largely focussed on off-grid installations. Following CanSIA statistics, there were at the end of 2007 only 27 % of the total PV capacity connected to the public grid. Another 27 % came from non-commercial and 46 % from commercial off-grid systems. However, the situation is expected to change in the future. CanSIA hopes that until 2025 installations in the range of 16 GW will be in operation. If the association turns out to be right, approximately 10 % of the Canadian electricity production could then come from PV installations. Seeing that in the course of the year 2007 5 MW were already added, the expectations do not seem to be too far off.

### Regional differences

The first accomplishments were a result mostly of the different incentive schemes of the provinces and territories that are responsible for energy policy and the structuring of the electricity market. The initial situation for renewables is therefore subject to regional differences, explains Susanne Ritter of CGCIC: "The provinces with the strongest population and growth rates such as Quebec, Alberta, British Columbia and Ontario provide the most interesting market potential for renewable energies." Some provincial governments provide tax rebates or legal frameworks for the electricity sold to utilities. In some cases programmes for increasing energy efficiency have also been introduced. British Columbia, for example, in



addition provides a market-based feed-in tariff. "However, the tariff price is set below 10 CAD-ct/kWh", adds CanSIA Director Elizabeth McDonald.

Ontario is today the only province that has an incentive scheme with fixed tariffs. The province's Regulatory Authority "Ontario Power Authority (OPA)" last year introduced the Integrated Power System Plan. It envisages 88 MW in larger systems of up to 10 MW and 126 MW in systems below 500 kW in the course of the next 20 years. Funding comes from the Renewable Energies Standard Offer Program (RESOP) that guarantees 42 CAD-ct/kWh over a 20 year payment period for PV systems with an output of no more than 10 MW.

### Wide responses – new debates

The incentive received such wide and positive responses that OPA has meanwhile been able to issue contribution agreements for systems with a total capacity of more than 520 MW. However, so far only a minor volume of 512 kW has been installed. "One reason for this is that many of the companies with solar installations under planning are waiting for the solar panel prices to drop. At present, modules are too expensive to make installations truly feasible", said Jane Story, spokesperson of the Ontario Sustainable Energy Association (OSEA). However, the projects must be realised within three years time after signing the RESOP contract or else the license is lost. "Many applicants have anticipated that the timeframe will work to their advantage", confirms David Oxtoby, CEO of the project company Carbon Free Technology from Toronto. "Many projects are not viable today, but might become so by 2010 or 2011. Developers are betting that the situation will change within the next three years."

Right now, the applicants in Ontario have to wait as the RESOP was put on hold in May this year to discuss the improvement of efficiency and further administrative simplification of the programme. The aim is to

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Victoria Hollick, Vice President of the Canadian Solar Association CanSIA

Photos (3): EUPD

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return to the initial programme scope of projects below 10 MW and to avoid scenarios, in which several 10 MW projects are later tied into one, explains Susanne Ritter. OSEA representatives expect the programme to be ready to continue by the end of the year. Jane Story remains sceptical: "In the opinion of the OSEA, the changes advanced by OPA would lead in the wrong direction. We believe that these changes will only help to create further problems and we hope for an evolved RESOP in the form of advanced renewable tariffs that better supports solar."

### Only small number of solar parks in sight

In the opinion of Leonard Allen, President of Solera, residential PV deployment will steadily grow, while the future for PV in Canada will mostly lie in industrial and commercial buildings and entail no more than a handful of larger solar parks. The company with head office in Toronto has already completed several reference projects such as a 10 kW system in the summer of 2008 for the independent Canadian certifier CSA.

Allen acquires new customers mostly through recommendation from earlier clients. As the range of experience in the country is still rather narrow, Allen does not see distinct product preferences among the Canadian customers. "So people go for the big name: Sanyo, Sharp or Mitsubishi." According to the government, about 90 to 95 % of the domestic PV industry is today located in the areas of project development and installation. However, the industry with only 50 Canadian members remains rather small. In the eyes of Victoria Hollick, Vice President of CanSIA, the market has not yet reached the end of the rope: "No doubt, Canada is becoming more attractive among international companies. Wholesalers, project companies as well as manufacturers, especially from the United States, are looking towards Canada with a growing interest. In the course of the past years, our association has attracted interest and counts now over 250 corporate

Other than in Central Europe, air heating is in North America also employed in private households. Naturally, the simple and extremely efficient air collector technology finds a wide acceptance in the public. *Photo: Grammer Solar*



members, in particular from our southern neighbour, among them Sunpower, Optisolar and SunEdison."

Day4 Energy Inc. and Centennial Solar Inc. are currently the only two manufacturers active in the Canadian module segment. However, Centennial Solar is maintaining only a single production site in St. Laurent, Quebec, with a capacity of 3 MW. Day4 Energy runs a production in the neighbourhood of Vancouver, British Columbia, with a total capacity of 47 MW. "We are planning to expand to 100 MW", says the company's spokesperson Rosalind Jackson. Other manufacturers such as Arise Technologies Inc. have only their headquarters located in Canada. The company's head office is based in Waterloo, Ontario, the production in Bischofswerda, Germany, in close vicinity to the booming European markets. Another example is the company Canadian Solar Inc. that has headquarters in Canada but the actual production in China.

### From pool heating to solar air heating

Contrary to the discussion around PV, the expectations of the solar thermal sector were fully met when Ontario's incentive scheme came into force. "The situation in Ontario is brilliant", says Victoria Hollick. With Ontario's Solar Thermal Heating Incentive (OSTHI), the provincial government has until 2011 provided CAD 14.4 million available next to the federal incentives for organisations in the commercial, industrial or institutional sectors. "The combination of federal and provincial government programmes and initiatives allows businesses, schools and municipalities to save up to 50 % of the investment costs when installing solar thermal systems", continues Hollick. Incentives of this kind, of course, also assist newcomers with their market entry. "We have seen a tremendous increase especially of solar thermal installers at the association level", reports CanSIA's Vice President. In Canada, the market also involves three steps for the distribution. However, following the government, most of the 70 Canadian companies currently active in the sector are project developers and installers. Despite the interest of many newcomers, Victoria Hollick is not troubled about matters of reliability and quality: "CanSIA facilitates certification programmes that have received a lot of requests and are available, for example, to installers of solar hot water systems."

According to a SAIC report, the traditional field for Canada's solar thermal professionals has been the pool heating market. However, in the last years, an increasing number of companies are entering into domestic water and solar air heating. In view of the existing incentives, the industrial and commercial sector is seen in a particularly attractive light. The Canadian solar thermal manufacturer Enerworks Inc. in February this year announced the founding of a new Commercial and Industrial Division. But also Conservall Engineering with their solar air heating technology Solarwall focuses on the market for commercial, industrial and institutional buildings. "Indoor space and ventilation heating is typically the largest single energy expenditure for buildings and our technology is able to cost-effectively displace up to 50 % of the heating costs", explains Victoria Hollick. The opinion that Canada provides a specifically interesting market for solar air collectors is

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Canada's economy is booming. But this also sends the energy demand soaring and again puts the environment at risk.

**Key figures for Canada**

Area	9,97 million km <sup>2</sup>
Population (April 2008)	32.9 million
GDP 2007	US\$ 1,432 billion
Primary electricity sources	hydro power (60 %)
Primary energy sources	fossil fuels, natural gas, coal (76 %)
Installed solar thermal capacity	418,897 m <sup>2</sup>
Installed PV capacity	25 MW (2007)

Source: bfaI, WWEA, CanSIA, IEA

confirmed by Siegfried Schröpf of Grammer Solar from Germany. "Looking at the long Canadian winters, the demand for heating systems is naturally high. Other than in Central Europe, however, air heating is in North America also used in private households, so the simple and efficient technology is already widely known and accepted," explains the CEO. The company is currently realising a pilot project in the province of Quebec where the utility Hydro-Québec is equipping 50 single family houses with Grammer air collectors.

**Solar energy with future prospects**

In the opinion of Leonard Allen of Solera, the participants of the solar sector are confident about the future. In order to further drive the implementation of PV in Canada, the opportunities of solar energy need to be demonstrated more efficiently to the public and to corporations, says Susanne Ritter, Director at CGCIC. Jane Story of OSEA expects that the cost will be an important factor: "PV and solar thermal systems will become increasingly popular as the prices of conventional energy sources escalate. There still exist barriers. However, we believe that solar energy is in an upswing and that eventually these barriers will be overcome."

Verena Vorwerk

**Further information:**

- [www.cansia.ca](http://www.cansia.ca)
- [www.directenergycentre.ca](http://www.directenergycentre.ca)
- [www.germanchamber.ca](http://www.germanchamber.ca)
- [www.nrcan.ca](http://www.nrcan.ca)
- [www.ontario-sea.org](http://www.ontario-sea.org)
- [www.powerauthority.on.ca](http://www.powerauthority.on.ca)
- [www.arisetech.com](http://www.arisetech.com)
- [www.carbonfreetechnology.com](http://www.carbonfreetechnology.com)
- [www.centennialsolar.com](http://www.centennialsolar.com)
- [www.csisolar.com](http://www.csisolar.com)
- [www.day4energy.com](http://www.day4energy.com)
- [www.grammer-solar.de](http://www.grammer-solar.de)
- [www.solarwall.ca](http://www.solarwall.ca)
- [www.soleraenergies.com](http://www.soleraenergies.com)

**Bogus trade exhibition**

Meanwhile there are also some dubious businesses trying to turn a profit on the Canadian solar market. One example was the trade exhibition and conference "Solar Power Canada 2008" that in several professional journals and sector forums had been advertised and scheduled to take place between September 16<sup>th</sup> and 18<sup>th</sup>. The website [www.solarpowercanada.com](http://www.solarpowercanada.com) had announced 200 exhibitors and 125 invited speakers from the solar sector. The venue was to be the Direct Energy Centre in Toronto. However, visitors on September 16<sup>th</sup> would have been surprised to find a vacant parking lot and locked entrance. Only an isolated 100 kW system on the historic Horse Palace of Toronto's mounted police pointed in the direction of renewable energy. Exactly who has to be held responsible for the deceptive website and the fictitious event is unclear as is the number of persons that were financially harmed.

At the Direct Energy Centre in Toronto, visitors of the fake Solar Power Canada 2008 found themselves in front of locked entrance doors.

Elizabeth McDonald, Director of the Canadian Solar Industry Association (CanSIA), had prior to the event announced that the association was aware of the issue. Together with Ontario's provincial government, the association tried to take corrective action, said McDonald. On the "first day" of the alleged congress, the website had already turned into a mere link list and is meanwhile completely removed. The sector is now looking forward to an authentic trade exhibition: CanSIA is inviting visitors between December 8<sup>th</sup> and 9<sup>th</sup> to an exhibition on the Canadian market at the Westin Harbour Castle in Toronto, Ontario.

