

Training, Education, and Public Awareness: Key Components for Developing a Strong and Vibrant Canadian Solar Industry

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ABSTRACT

Solar technologies are already competitive in several niche contexts (e.g. photovoltaic systems in remote locations, solar heating for swimming pools and commercial buildings), and will become widely used in a variety of mainstream applications if the right policy mechanisms are implemented. Canada needs to implement effective strategies to ensure that public awareness about solar energy increases exponentially and to train the researchers and technicians that can design, implement, and maintain a variety of renewable energy systems. This paper describes the ongoing activities of the Renewable Energy Advisory Committee on Training (REACT), and based on that experience provides key recommendations to ensure that solar technologies become an essential component of Canada's energy mix.

INTRODUCTION

A key obstacle for the widespread adoption of solar alternatives is that politicians, decision-makers, financiers, government employees, and members of the general public are usually not aware of how much solar technologies have evolved and improved in the last decade. This lack of awareness is severely limiting the implementation of viable and practical solar solutions that can enhance local energy security and reduce the use of polluting sources of energy. In addition, as the cost of solar options decrease and technology matures, the pace of their implementation is becoming constrained by other factors. Three key constraining factors are: risk perception, access to financial capital, and development of local capacity. These constraining factors are intimately and directly related, as risk perception increases, access to financial capital becomes more difficult and onerous. Risk perception can be changed by innovative educational strategies aimed at increasing awareness, political support, local capacity, and know-how. In addition, local capacity development not only can increase public awareness but is also essential to ensure that solar projects are properly designed and maintained.

The deployment of solar systems, and a variety of other renewable energy technologies, will increase exponentially during the next decade as Canada and other nations seek viable alternatives that can enhance energy security, increase sustainability, and reduce the greenhouse gas emissions responsible for climate change. This process will demand special and careful attention by policy makers to achieve positive and lasting results.

Although the underlying principles of all renewable energy technologies are rooted in traditional scientific and engineering subjects, their hardware requirements and deployment strategies are considerably different from centralized energy sources (e.g. large-scale hydro, fossil and nuclear plants). Therefore, clear and forward looking policies are needed to ensure that technicians, technologists and engineers that possess firm technical training in renewable energy technologies are properly and timely trained.

To meet these essential needs, educational organizations must plan for the initiation, development and evolution of renewable energy training programs that provide content specifically tailored to the requirements of existing renewable energy deployment plans and targets (such as the new federal government's RPPI).¹

The accumulated experience from the countries leading in the worldwide adoption of renewable energy is clear: success is achieved through conscious policy decisions that create stable demand for renewable energy technologies, ensure favourable access to the electricity grid at attractive prices, facilitate low cost financing, provide tax incentives and smart subsidies, legislate standards, support education initiatives, and encourage active stakeholder participation.²

The remainder of this paper describes the experience acquired by the Renewable Energy Advisory Committee on Training, which represents the only current national initiative focused on renewable energy education and training in Canadian colleges and institutes. Based on an analysis of this innovative initiative the paper concludes with a series of practical suggestions to develop a strong national renewable energy initiative on training, education and public awareness.

BACKGROUND

In September 2002, as an initial step to address training issues in Canada, the Association of Canadian Community Colleges (ACCC) and the renewable energy industries jointly initiated the Renewable Energy Advisory Committee on Training (REACT).

REACT is comprised of representatives from the renewable energy industries, ACCC, individual colleges, and Natural Resources Canada (see Appendix 1 for a list of current members). Using funding provided by the Renewable Energy Deployment Initiative (REDI) of Natural Resources Canada, and in-kind contributions from members of the committee, REACT has conducted research into the availability of renewable energy training in Canada and has identified key human resources challenges faced by all the renewable energy industries in Canada. Using the results of these research efforts, REACT has developed a series of proposals to advance the status of renewable energy education and training in Canada.

The primary goal of REACT's ongoing initiatives is to develop technical training opportunities to fulfill the need for leaders and skilled employees in all renewable energy industries. Another complimentary goal of REACT is focusing on public education to increase public knowledge about sustainable energy options as viable solutions to social and environmental problems (such as climate change).

In short, the key mission of REACT is to raise awareness of renewable energy issues within all segments of the population (including remote, rural and Aboriginal communities), develop national training standards, create curriculum, implement programs in both official languages, and implement mechanisms to support the sharing of training strategies and training opportunities.

- ACCC developed a website to foster environmental stewardship in Canadian colleges and institutes
http://www.accc.ca/english/services/renewable_energy.htm
- REACT researched into existing renewable energy programs and elaborated needs assessments, including gap analysis. These efforts are summarized in a report released in 2004 that outlines a conceptual framework for renewable energy training development.
- Developed renewable energy training projects.
- Participated in a week-long renewable energy training seminar including a ‘train-the-trainers’ session.
- Developed and published the “*Strategic Plan for Renewable Energy Training at Canadian Community Colleges and Institutes*”.³
- Joined the United Nations Educational, Scientific and Cultural Organization (UNESCO) Decade on Education for Sustainable Development in 2005.
- Created a portal on renewable energy training and education: <http://www.creet.ca/>
- Created a website on renewable energy and public education: <http://oahu.ol.mala.bc.ca/RE/>

Figure 1: Summary of Achievements of the Renewable Energy Advisory Committee on Training (REACT)

REACT’s strategy for implementing renewable energy training in Canada was developed through a year-long process of research and consultation with the renewable energy industries and with academic representatives from colleges and institutes.

The main aspects of REACT’s strategic plan for renewable energy training include:

- building awareness on renewable energy and sustainability issues;
- enhancing training opportunities by integrating renewable energy curriculum into existing technical training programs;
- developing new technical training programs;
- implementing diploma and degree programs in renewable energy.

REACT’s training’s plan is being achieved through technical training programs developed in cooperation with accreditation and standards bodies (such as provincial apprenticeship programs and professional associations). These initiatives are designed to address both technical and socio-economic issues related to renewable energy.³

REACT is currently working with Natural Resources Canada, Environment Canada, Industry Canada, Human Resources and Skills Development Canada and other federal, provincial and provincial government departments to evaluate the advantages of transforming REACT into a self-sustaining body that will lead curriculum development and training accreditation, including certification programs, in Canada. This permanent body would include representation from industry, the college and institute sector, and from professional associations.

OPPORTUNITIES AND BARRIERS TO DEVELOP A STRONG CANADIAN RENEWABLE ENERGY TRAINING INITIATIVE

The strengths of REACT lie in the multidimensional partnerships linking ACCC and its participating member colleges and institutes with Natural Resources Canada, industry associations and engaged First Nations networks. The active involvement of all these partners in REACT builds support and credibility in the committee's efforts to develop curriculum and nurture a community of renewable energy educators.

REACT intends to seize opportunities to address identified renewable energy training gaps in Canada and to secure the resources required to build the foundation for both the adaptation of training programs already in use in other countries and the introduction of new ones applicable to Canadian commitments in renewable energy capacity-building, youth employment, rural development, responsible energy use and working in partnership with First Nations leaders and communities.

REACT is currently working with European and U.S. partners to share related policy experience, and to collaborate in the development of innovative educational and technical initiatives. REACT anticipates that significant funding opportunities related to climate change and environmental protection activities will arise to help Canada develop its own renewable energy training programs.

One of the primary barriers identified by REACT are the resistance of facility managers and other college and institute leaders and decision-makers towards greater incorporation of renewable energy technologies. This problem is compounded by the fact that the education sector in Canada is currently facing limited funding for the development of new programs. This situation creates a vicious circle where scarce funding in the education system is limiting the proper deployment of renewable energy technologies in Canada.

An additional barrier to developing solar, and several other renewable energy technologies, is the existence of inconsistent and limited support policies for the sector, and inadequate regulations and standards for the renewable energy sector.

All of these barriers result in an overall lack of awareness of the potential of solar technologies and renewable energy on the part of the general public, professional communities, and governments at all levels.

REACT's key challenge is to achieve rapid change to increase awareness among colleges, institutes, the private sector, and leaders at all levels of government to generate greater understanding of energy issues and the role that solar and other renewable energy technologies can play to address society's energy needs and environmental issues.

CONCLUSIONS

REACT's challenge translates into an imperative need to increase general awareness of renewable energy, to establish an accreditation system for renewable energy curriculum, and to provide leadership in the deployment of renewable energy training. REACT's renewable energy training initiative has the potential to ensure improved skills for the Canadian workforce, which in turn can assure quality solar installations. Certification programs and training are also essential to ensure system performance and to promote consumer acceptance.

The uptake and replication of renewable energy systems across colleges and institutes remain a challenging undertaking. However, REACT's vision of evolving into a self-sustaining body that fosters an innovative renewable energy training infrastructure and programs throughout the Canadian college and institute network provides a unique opportunity to provide a permanent place to host a leading community of practitioners in solar and renewable energy training and public education in Canada.

All levels of government and the private sector need to address more seriously the fact that the successful development of solar installations and manufacturing capabilities in Canada are intrinsically dependant on having a properly informed public and a well-trained workforce.

All the countries that are currently world leaders on renewable energy installations and manufacturing have developed strong proactive policies to address these issues and have also committed stable funding resources to ensure active local participation and to ensure that education opportunities are widely available within their jurisdictions. Canada needs to emulate and augment these steps to take its long overdue place amongst the world leaders on renewable energy.

NOTES

¹ The Renewable Power Production Incentive (RPPI) announced in the 2005 budget allocates \$97 million over 5 years and \$886 million over 15 years to support the installation of up to 1500 MW of new renewable energy electricity generation, other than wind power. The incentive is intended to provide 1 cent per kWh of production for the first ten years of production. This incentive represents a step in the right direction; however, that level of support is clearly inadequate for a variety of renewable energy options (e.g. photovoltaics).

² For the past decade six countries: Denmark, Germany, India, Japan, Spain and the United States have achieved 80 percent of the world's solar and wind installation through policy mechanisms that address these factors. For details see Sawin, J.L. (2004). *Mainstreaming Renewable Energy in the 21st Century*. Washington DC: Worldwatch Institute. Available at www.worldwatch.org

³ For details on the Strategic Plan for Renewable Energy Training at Canadian Colleges and Institutes consult Natural Resources Canada's website at:
www2.nrcan.gc.ca/es/erb/CMFiles/FinalENG-REACTstrategicplan3173JCK-29042005-1159.pdf

Appendix 1
Renewable Energy Advisory Committee on Training
Profile and composition

The Renewable Energy Advisory Committee on Training REACT was established by ACCC in 2002. Its members, and their affiliations, are listed in the following table.

Richard Olmstead- Chair	Manager Information Systems New Brunswick Community College-NBCC Woodstock Campus, NB
Bernard Hamilton- Vice-Chair	Development Advisory, Cégep de la Gaspésie et des Îles, QC
Dr. David Drakeford	Dean, Science and Technology Malaspina University-College, BC
Don Young	Dean, School of Computer and Engineering Technology and School of Skilled Trades St. Lawrence College, ON
Donna Spaulding	Dean, Faculty of Continuing Education and Extension, Mount Royal College, AB
Daniel Hill	Director of Development, Native Education Centre, BC
Bill Humber	Chair, Centre for the Built Environment, Seneca College of Applied Arts and Technology, ON
Robert MacRae	Instructor, Integrated Environmental Planning Technology, Selkirk College, BC
Brian O’Neill	Project Coordinator – Climate Change training Strategy Trades and Technology Training Holland College, PEI
Bill Eggertson	Canadian Association for Renewable Energies
Sean Whittaker	Canadian Wind Energy Association
Patrick Savoie	Canadian Solar Industries Association
Maria DoRego-Fiore	Market Development Officer, Renewable Energy, Renewable and Electrical Energy Division, NRCan
Morel Oprisan	Coordinator – Renewable Energy Technology – CANMET Energy Technology Centre, NRCan
Bernard Lachance	Vice President, Partnership Programs, Association of Canadian Community Colleges
Lise Robitaille	Training and Development Officer, Partnership Programs, Association of Canadian Community Colleges