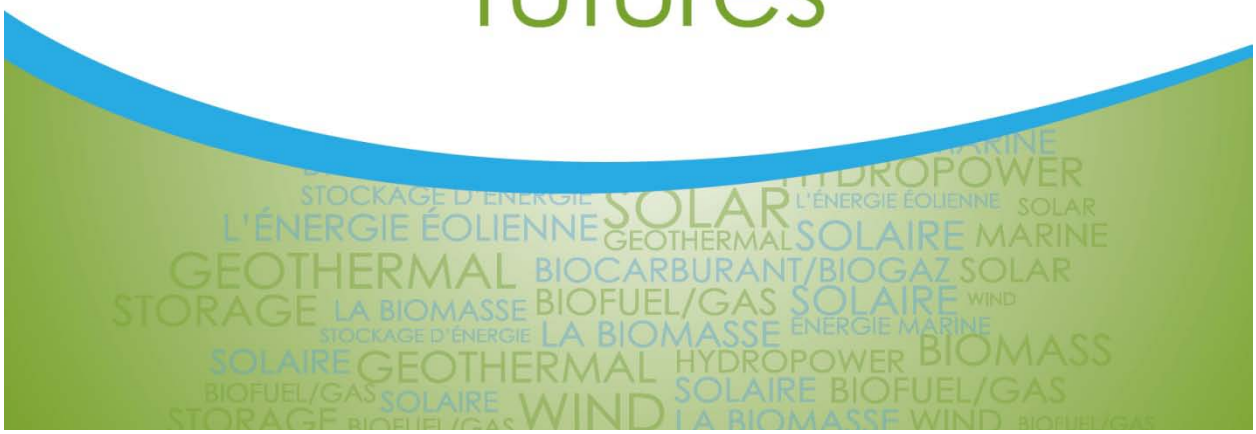
renewing futures

Powerful HR Solutions for the Renewable Energy Workforce



Executive Summary

Trends and Technology Review

Executive Summary

Renewable energy (RE) technologies play a crucial role in sustainable development for the world and for Canada. Plans for deploying these technologies are an essential element in the reduction of Greenhouse Gas (GHG) emissions and the management of global warming. Canada is a leader in the use of RE and the advance of policies and innovations. This report is the first publication of the Renewing Futures project from Electricity Human Resources Canada.

Growth is the dominant feature of the RE industry. Canadian investments in many RE technologies have increased ten-fold in the last decade and the list of projects continues to grow. Industrial growth on this scale brings many economic benefits including the addition of new jobs. For example, the European Union, a leader in RE development, tracks the employment impacts of industry expansion and regards this benefit as a major government policy objective.

Similar advantages can be expected in Canada. Electricity Human Resources Canada, in cooperation with the RE industry and other stakeholders, has initiated "Renewing Futures" a major, national human resources (HR) research project that will provide current and forward looking information on the impact of RE deployment on labour markets and key occupations across Canada. Renewing Futures will create a national HR strategy for renewable energy that will assist in building a skilled workforce that will meet employer needs for the next ten years. The strategy will cover training programs, regulations and government policies, certification, interprovincial mobility, retirements and retention and sector specific specializations.

Renewable energy covers a wide range of activity and this study will be focused on six technology sectors:

1. Wind
2. Solar
3. Bioenergy
4. Geothermal
5. Hydro: Large and Small
6. Marine: Tidal, Waves

Employers and the labour force working in these sectors are the primary focus of the project. It is recognized that the deployment of these technologies will depend on the development of the electricity generation, transmission and distribution systems. New installed capacity of each of the six RE technologies will be connected to the grid; adding a new supply to the existing system. Each source of RE has different properties and will impact the electric grid in different ways. For example, electricity from some RE sources is intermittent and higher shares of intermittent energy sources would require changes to the way the conventional grid is operated and managed. Storage technologies have a role here, amongst other approaches. This relationship between the RE and the existing electricity systems prompts the addition of a technology review in a seventh sector.

7. Integration and Storage

Technologies, systems and processes included in this last sector might be present in either or both of the RE and conventional energy systems. The pace of installation and the numbers and skills of the

workforce will be affected by change in these systems and these impacts are a key part of the human resources analysis. Electricity Human Resources Canada has completed a labour market and human resources plan for the conventional electricity sector and findings from that work will be applied to the analysis in this study – especially in the area of large hydro which was included in the earlier work.[1] Indeed, large hydroelectric capacity is a dominant feature of Canada's RE generation and, additionally, offers the largest storage potential.

Market Assessments

Three scenarios have been developed and offer alternative projections of future deployment for RE in each Province. The scenarios are intended to reflect the range of possible outcomes and the uncertainties that are associated with projections that extend from 2013 to 2022.

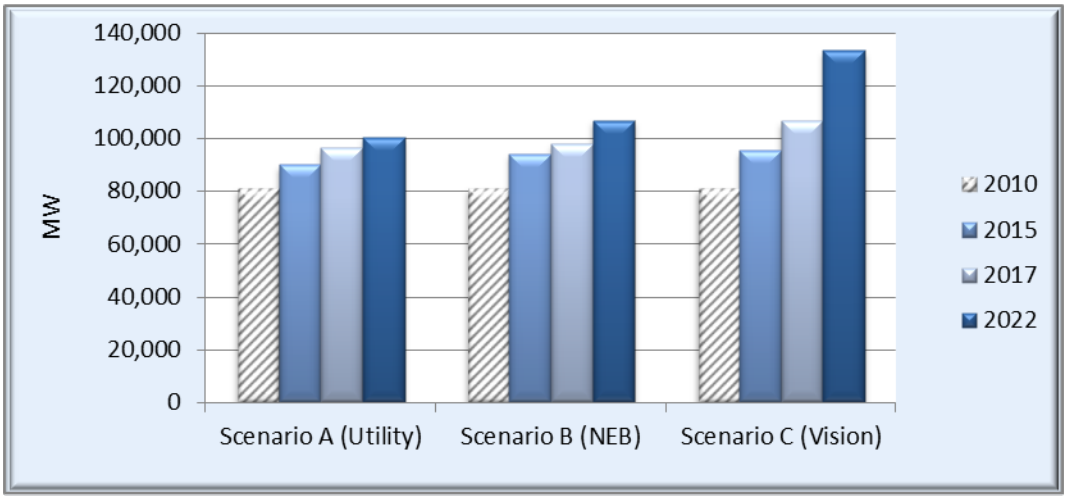
Three scenarios are used in the market assessments to define upper and lower limits to labour requirements.

Exhibit 1 offers a visual summary of the total change in ERE systems projected in each scenario.

Exhibit 1

Three Scenarios for Renewable Energy Systems in Canada, 2010 to 2022

Projections of Installed Capacity, All ERE Sectors, in MWs, Canada



Sources: Base year: Statistics Canada catalogue 57-206, Electric Power Generating Stations
Scenario B: National Energy Board Canada's Energy Future, November 2011
Scenarios A and C: Prism Economics

In each scenario the additions to RE systems across the ten + years run from 20% to 60%. Large hydro and wind systems dominate the additional capacity but there are notable gains for the other technologies.

[1] "Power in Motion 2011 Labour Market Information (LMI) Study" Electricity Sector Council.

Scenario A projects the more limited increases that are currently built into the plans of the large utilities and system planners. Scenario B offers an alternative that captures the view of the National Energy Board and includes an underlying projection of economic conditions and industry growth by province. Scenario C captures the vision of the industry proponents and elements of government policy for RE and sustainability in general. Each scenario is simply one possible representation of the future. It is not implied that one is more likely than the other. All three, together, have been constructed to represent the range of likely outcomes for the levels of installed capacity and the related human resource requirements.

Technology Profiles

Each Profile is summarized in the Technology Review in six parts:

- Synthesis;
- State of Maturity;
- Cost and Development Trends;
- Environmental Considerations;
- Technical and Non-technical Advantages and Challenges; and
- Emerging Trends and Related Markets.

Key findings for each technology include:

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