

## **Backgrounder on the Environmental Technologies Sector in Western Canada**

The Canadian environmental industry is diverse fragmented, dominated by SMEs, and localized with little experience of exporting but it also can be very innovative and is capable of forming international alliances and partnerships. In our opinion the industry exhibits highlights of great potential in many innovative areas.

This terse description of the Canadian environment industry in a soon to be released Industry Canada report is an apt summary also of the environmental technology sector in Western Canada. This sector is comprised of a growing mix of private enterprises and public institutions developing or providing goods and services designed to prevent or mitigate environmental problems and supporting sustainable development activities in every aspect of human society. Service providers rather than technology producers dominate the environmental sector in Canada although the demand for new technologies to combat climate change, increase energy efficiency and enhance sustainability in the transportation, agriculture, energy and natural resource sectors continues to escalate.

The Western Canadian environmental business sector is undergoing a fundamental re-orientation and renewal. The current trend towards pollution prevention at source not only is decreasing the demand for traditional and often more expensive end-of-pipe pollution control technologies, it is spurring the development of more energy-efficient and cleaner technologies for application in the primary resource, manufacturing, energy and service sectors as well.

Climate change and the search for more energy efficient technologies to reduce greenhouse gas emissions is forcing the sector to redefine itself and to form new alliances and partnerships with governments and academia focused more broadly on sustainability. This is one of the reasons why Western Economic Diversification launched an initiative for a multi-stakeholder Environmental Technologies Forum to build a consensus between government and industry on the opportunities and actions necessary to strengthen environmental technology development in western Canada.

The drivers of the transformation process are as diverse as the client base of the industry itself. Changing environmental management practices in the private sector, new approaches to public policy making with respect to environmental protection, and shifting economic forces globally are helping to reshape the sector. No longer focused on "end-of-pipe" solutions to treat pollutants released into the air, water or soil, the sector is evolving into a complex and rapidly changing constellation of engineering, analytical and design services designed to help businesses incorporate environmental considerations into their production processes and in their dealings with client communities and customers. The sector is now much more closely linked to organizations involved in sustainable community development; green building design and construction; energy efficiency and eco-industrial networking; sustainable urban infrastructure; and sustainable resource management.

The environmental sector in Western Canada has traditionally drawn strength from its domestic client base. In recent years, opportunities in the export market have become more enticing, a reflection not only of the increasing

globalization of the sector but also of Canada's growing international reputation for quality technological and environmental expertise, particularly related to water and wastewater treatment, liquid and solid waste management, environmental instrumentation and analysis, energy efficiency and renewable energy, and engineering and consulting services.

Despite this growing interest in the international market, most firms active in this sector are small to medium-sized enterprises often lacking the money, managerial capacity or staying power needed for extensive technology development and/or international market expansion activities. But as the quote notes, the sector is capable of great innovation and has a future in the international marketplace. The challenge is to identify where comparative and competitive advantage lies particularly when it comes to new technology development.

As indicated earlier and as demonstrated by the Technologies & Opportunities table each province has capacity and demand in almost every sector. The challenge is to identify where comparative and competitive advantage lies particularly when it comes to new technology development. The environment sector is not consensus driven and service providers will always be linked to defined problems and needs in the service area. As noted most of the environment sector in western Canada is made up of small to medium sized service providers that respond to local conditions and requirements. For the most part, these will be implemented in the context of provincial strategies, as the jurisdictional basis for key problem areas (water, wastes, contaminated sites, air quality, land use, urban planning, etc.), are largely - though not exclusively - within provincial jurisdiction.

On the other hand Technological solutions that have broad application nationally and internationally will require capital, perseverance, extensive product development and verification activity, as well as market development and promotion. These opportunities require focus as well as strategic partnerships involving private companies, governmental agencies, as well as academic and research institutions. To successfully develop such technologies in a nexus of support it would appear logical to support centers of excellence where such a coalition of interests and comparative and competitive advantage exist.

**The following actions are recommended:**

A comprehensive initiative to support the establishment or strengthening sector-specific centres of excellence and/or government-industry industry clusters in each province to foster the development of innovative environmental technology solutions to global environmental problems. Such centres should bring together the academic, marketing, business development and financial management competencies needed to facilitate the development and commercialization of innovative technologies, services and environmental solutions required in the national and international marketplace. These centres and clusters should be established only where there is a clearly defined, actual or potential critical mass, and a market sufficient to warrant any required investment. For the most part, these centres should be industry led. Green Buildings/Sustainable Construction, Water/Wastewater, Alternative Energy Sources and Contaminated Site/Brownfield Remediation are the most obvious new candidates in this regard. Existing centres and initiatives targeted to this or similar ends should be reviewed to gauge their actual effectiveness.

A comprehensive research program specific to each province be launched to identify barriers limiting the adoption of innovative technologies and related environmental solutions by municipalities, government departments and agencies and by major industry players in each sector. This should be followed by risk reduction strategies and/or the provision of incentives for the early adoption of innovative technologies, and such industry capacity building measures as:

Business leaders' forums to build industry understanding of the importance of supporting enabling technologies and solutions upon which future commercial success depends. Targeted programs to support the re-design, re-engineering, and retrofitting of production processes and product lines to increase business resource efficiency and waste reduction in specific sectors, particularly those that face intense competition or that compromise local liveability standards; Linking infrastructure renewal dollars to the degree of innovation and local content an organization (i.e. municipality) has included in its funding submission. This could create a stronger presence for local entrepreneurs in local markets without being perceived as being an industry hand-out. Targeted strategies for import substitution in those environment-related areas where Western Canada is dependent upon imported products and technologies, primarily in the water/wastewater, solid waste management, air quality management, contaminated site remediation and energy sectors.

The creation of a comprehensive marketing program to build national and international recognition of Western Canada's environmental excellence through collaborative programs involving technology demonstration projects; market development and networking activities; and national and international promotional efforts designed to attract new customers and new investment to the sector. This initiative must be carefully choreographed so as to reach the right market audiences in languages that they understand and be supplemented by site visits, focused trade fair/conference presentations, sponsored buyer missions, demonstration projects and on-line and printed materials.

A program to support demonstration projects, particularly involving large scale, real-world urban showcase sites where Western Canadian environmental technologies, products and services can be tested, verified and displayed in order to attract new national and international customers, and to foster their adoption by local industries and municipalities.

A pan-Western initiative to encourage venture capital and investment financing in the environmental technologies sector by removing or reducing the risk factors associated with technology verification and commercialization; by providing fiscal incentives to stimulate capital investment in the environmental business sector; and by supporting specialized technical conferences and venture capital venues where investors and potential customers can interact with government agencies, technology research and development organizations, and industry and professional associations. This program could involve an annual venture capital fair in western Canada. Such measures are essential to close the R&D innovation/adoption gap that is behind the inability of environmental firms in Western Canada to attract early stage, proof of concept funding.

A review should be carried out of the merits of adopting financial incentives similar to those used in other sectors (e.g. fiscal regimes for oil sands development) in the environmental business sector. Financial incentives such as provincial R&D tax credits, renewable energy incentives etc., and other fiscal measures should be examined to determine their overall economic impacts and technology development potential.

The provision of on-going mentoring for small and medium-sized enterprises in environmental business sectors by working with individual firms and industry associations to improve environmental technology development and commercialization; to provide the tools and up to date intelligence needed to penetrate new markets; and to establish mutually supportive networks to promote the delivery of flexible solutions and technologies for local, regional and international customers.

A comprehensive review of current government funding programs that support small and medium sized enterprises in the continuum of activities from research and development through to technology development and commercialization. This would include such federal programs as IRAP's Pre-commercialization Assistance Program and the Program for Export Market Development (PEMD). This review should bring forward recommendations on:

- Improved coordination between available programs;
- Providing more consistency in focus from one jurisdiction to the other;
- Simplifying access to and administrative processes associated with these programs; and
- Instituting provisions for affordable, repayable financing for early stage product development.

A comprehensive review of government policies, federally, provincially and municipally to ensure that public policy supports private initiative in developing the environmental technology sector. E.g. procurement policies, regulations that impact on demonstration projects etc.

Finally one of the most important elements of any strategy to energize the Western Canadian environmental business sector is the need for all key stakeholders involved to believe in the potential of the sector and to champion its causes. This means that all levels of government and in particular key agencies such as the overseas missions of DFAIT, the on-line services of Industry Canada and other Departments, must recognize and help to promote Western Canada as a source of innovative expertise and technologies for a world very much in need of what we have to offer.

Reference:

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Note:

This Backgrounder is based on the findings of a series of environmental sector reviews undertaken in each of the four Western Provinces and summarized in a report prepared by the GLOBE Foundation of Canada with assistance provided by Western Economic Diversification Canada.