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Environmental Technologies Sector Profile

Prepared for Western Economic Diversification Canada

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EXECUTIVE SUMMARY

This report provides a profile of the environmental technologies sector in Western Canada. The main objective is to provide a high level overview of the sector, including its size, reach, economic impact, development issues, and some consideration of trade opportunities. This sector profile was developed from an information gathering followed by company level interviews and information analysis.

The information gathering relied primarily on published sources, industry associations, and company websites. The first round of information analysis established a list of Canadian companies that are active in supplying environmental goods and services. A brief profiling exercise identified key sector characteristics, commercialization and technology research, government support for environmental technologies, market position, and potential barriers and keys to success.

The industries and sub-industries that supply environmental goods and services were grouped into eight functional areas. Each of these eight areas could be studied further by WED staff to fill in the next level of detail and understanding, however, the first five categories should be a priority because of their size, diversity, and their focus on technology. The categories are: Water supply, treatment and conservation; air pollution and emissions control; waste management and remediation; energy conservation and efficiency; renewable energy and alternative fuel production; analytical equipment; noise and vibration abatement; and, engineering, consulting, and any area not included above. The functional classification is more useful than a traditional NAICS-based industry classification approach. Our review of provincial activities is based on the eight activity groups identified at the beginning of this section.

Western Canada's environmental goods and services industry is small and inwardly focused. According to Statistics Canada, the four western provinces generated approximately $6 billion in sales of environmental goods and services in 2004, or just 32.6% of the Canadian total. The interview data collected broadly supports this observation, with several companies indicating that they are too small to export, do not have the financial support to export, or are opportunistic and export only when customers find them.

ET companies in western Canada are also smaller, on average, than in the rest of Canada. Based on revenues per company, the four western provinces show an average of $1.8 million per

company per year (based on 2004 data) as compared to the national average of $2.2 million per company per year, representing an 18% difference.[1]

In 2004, Canada's environmental goods and services industry generated approximately $18.5 billion in revenues. The four western Canadian provinces collectively accounted for approximately one third of that amount: Alberta registered $2.8 billion in revenues followed by British Columbia with $2.3 billion, then Manitoba with $492 million and finally, Saskatchewan at $410 million. Three quarters of Canada's environmental exports are to the US, and the western provinces account for less than 25% of total environmental exports[2].

While environmental clusters are lacking, the Canadian government is active in assisting environmental business to develop products and services. For example, Industry Canada, the Atlantic Canada Opportunities Agency and Export Development Canada (EDC) provide funding and program support to this sector.

In 2004, Canadian environmental sector employed 251,000 individuals, up from 221,000 in 2000. Approximately 37 per cent of all environmental practitioners work in western Canadian provinces or the territories.[3] However, the problem of attracting and retaining qualified people is significant. Consequently, the federal government has established the Canadian Council for Human Resources in the Environment Industry (CCHREI) which involves employment needs surveys, recruitment campaigns as well as educators to ensure a continuing supply of labour is available.

In addition to the U.S. and Europe, there are market opportunities in Asia for Canadian environmental goods and services. China and India face mounting environmental challenges and the environmental services and engineering sectors specializing in water, waste management, emissions and noise control or abatement and environmental protection will be in high demand. Opportunities also exist in East and Southeast Asia for waste handling, incineration and recycling.

Key Results by Province

British Columbia

British Columbia's environmental technologies sector consists of a wide-range of firms producing environmental goods and services targeted at clean air, water and land and climate change. British Columbia's environmental technologies sector consists of the following key sub-sectors: Alternative energy systems, fuel cells and the hydrogen economy, waste management, urban environmental management systems, waste water/ water technologies and services, environmental monitoring and consulting services.

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[1] Environment Industry Survey Business Sector. Statistics Canada. 2002. Catalogue no. 16F0008XIE and updated spreadsheet.
[2] Environment Industry Survey Business Sector. Statistics Canada. 2002. Catalogue no. 16F0008XIE and updated spreadsheet.
[3] Canadian Council for Human Resources in the Environment Industry, *Environmental*, p. 8.

Fifteen companies were approached to conduct the interviews, and of these, thirteen companies completed the interviews. Overall, responses were obtained from 5 of the 8 activity groups. The business lines of the companies interviewed ranged from waste and recycling management, soil remediation, environmental consulting, landfill design, fuel cell development, energy efficiency technology development, clean transportation technology development and environmental monitoring and analysis.

The main findings in British Columbia are that environmental goods and services are the primary line of business for all of the companies surveyed and the majority of companies are privately owned, have fewer than 10 employees, and revenues from environmental goods and services of less than $1 million. In addition, almost all of the companies plan to hire additional employees in the coming year.

The key success factors to domestic market development included government support through legislation and policies and good business practices. The key success factors to export market development were government support, economics and competitiveness, and establishing relationships with foreign clients.

The key barriers to success in domestic markets included a lack of sufficient human resources, environmental legislation and market familiarity with environmental technologies. Additionally, the breadth of the country and lengthy approvals for new technologies were identified as impediments. Costs associated with establishing relationships with foreign clients, import tariffs and competition from international firms were all key barriers to export market development.

The United States remains the largest export market for BC-based environmental product and services companies, though many are now venturing out to markets in the Asia Pacific, Central and South American and Western and Central Europe. A number of firms indicated that they relied on some form of venture capital and government programs, such as the Scientific Research and Experimental Development tax credit program and Sustainable Development Technology Canada. The majority of companies interviewed indicated that their primary R&D focus is on in house research and product development, while a smaller proportion of the companies interviewed indicated that they fund external research organizations to conduct R&D activities. Almost all of the companies indicated that they are actively developing new commercial environmental products.

Alberta

Environmental goods and services account for just over 1% of the total industrial output of Alberta. The most recent data available from Statistics Canada indicate a total employment for 2002 in Alberta’s environmental sector of 25,855 persons at 1,085 establishments[4]. The major sub-groups within Alberta’s environmental sector are oil & gas industry support, land remediation, agriculture, and renewable and alternative energy technologies. These are areas of specialization, in addition to the waste management, construction, and water treatment activities common to all provinces. Alberta also has a thriving bio-fuels sector.

[4] Environment Industry Survey Business Sector. Statistics Canada. 2002. Catalogue no. 16F0008XIE. Table A-6.

As with each of the provinces, we started with a list of companies generated from projects listed on government websites, industry association websites, and news releases. Of the 15 companies approached, 7 accepted interviews. Responses were obtained from companies in 5 of the 8 activity groups. Their business lines included field sampling of water quality, safety supplies, bio-remediation of soils, water well services, engine technologies, waste heat capture for efficiency improvement, and treatment of waste water in food processing.

The majority of companies are privately owned, have fewer than 10 employees, and have either no revenues or have costs in excess of revenues. In addition, almost all of the companies plan to hire additional employees in the coming year.

Key success factors for commercial companies included good business practices, having leading edge technology and reliable products. The companies interviewed indicated that the key barriers to success for commercial companies are regional and fragmented markets and non-price entry barriers such as dominant market position. A number of key success factors and barriers to success for non-commercial companies were also revealed.

Alberta companies suggested that the government's role is to create a fair and balanced investment climate, remove regulatory barriers, and allow companies to move forward. They suggested that the government should support flow through share[5] mechanisms, expanded R&D tax credits, or accelerated depreciation for machinery and equipment.

Alberta's environmental goods and services industry is inwardly focused, with exports accounting for only 6.5% of industry revenues. Further, 86.6% of exports are to the U.S., leaving only $20 million of environmental exports to the rest of the world. Only two companies indicated exports to markets other than the US, and only one company identified export markets as a key element of their business strategy.

The majority of the companies that responded indicated that their primary R&D focus is on in-house research and product development rather than funding external research initiatives. Additionally, almost all companies indicated that they were focused on short-term product development cycles of three years or less and that they are developing more than one product for future commercialization.

Saskatchewan

Saskatchewan's environmental technologies sector is narrowly focused with the two main areas: biofuels (ethanol production) and alternative energy (solar and wind power), in addition to waste management, water treatment, agriculture, and land remediation. The main business lines of the companies interviewed included land remediation and soil testing, consulting and engineering, water treatment and quality, energy efficiency and climate change issues.

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[5] Flow through shares allow companies that are not in a taxable position to transfer their tax deductions or credits to investors who purchase the flow through shares. This creates an incentive to invest in risky ventures because the investment is often fully recovered through tax reductions. Flow through shares are commonly used by small oil and gas exploration and production companies.

The companies are all privately held small enterprises with the majority employing less than 10 people directly with the possibility for expansion in the coming year. Most companies interviewed focus entirely on environmental goods or services and have commercial products on the market. Only one company indicated sales in excess of $1 million annually and 5 indicated that they showed a profit last year.

A number of significant barriers to success in domestic markets were discussed in the interviews such as, labour availability, skills availability, the disparate regulatory systems between provinces, the resistance of the CSA to new products/cutting the red-tape, a disinterest from Canadian financial institutions to finance environmental technology development and commercialization, and lack of awareness of the public to the products and services that are available.

The companies interviewed are actively engaged in seeking export markets for their technologies. For example, three companies indicated sales above 60% originating outside of Canada and the other two reported small, but growing, levels of international sales. All companies reported doing research in-house and four companies indicated that they hold patents. In addition, almost all companies are actively developing new environmental products.

Manitoba

Manitoba's environmental goods and services industry appears to be focused mostly on the traditional range of water treatment, waste management, soil remediation, noise management, air monitoring, hazardous waste management, and renewable energy. The environmental technology firms from Manitoba interviewed in this exercise are focused on consulting and engineering, land and water remediation and biomass energy.

Companies identified visibility, good businesses practices and enforcement of environmental regulations as keys to success in domestic markets. Visibility and having a unique or leading edge product were identified as keys to success in export markets. Additionally, several challenges for domestic and export market development were mentioned. Companies need a unique new product or better reputation in order to succeed. Canada is not developing leading edge technologies because the regulatory regime is lagging.

All companies interviewed are active in international markets with exports to the US, Asia, Europe, Latin America and Australia/New Zealand. Half of the interviewees have accessed government funding and one reported relied on financial institutions. Similar to the Saskatchewan environmental technology firms, the Manitoban companies are strongly involved with in-house research and development, although most indicated that they purchase R&D as well. In addition, most companies reported holding no patents, although all companies that responded indicated that they re-invest 3% or more of revenues in R&D.