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Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008

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CANADIAN WIND ENERGY ASSOCIATION | ASSOCIATION CANADIENNE DE L'ÉNERGIE ÉOLIENNE

Glossary

CAGR	Compounded annual growth rate
CanWEA	Canadian Wind Energy Association
CNC	Computer numerical control
FIT	Feed-in tariff
FTE	Full-time equivalent
n	Number of respondents who answered the question
NIMBY	Not in my backyard
UK	United Kingdom
USA	United States of America
R&D	Research and development
RD&D	Research, development, and demonstration

Please note: The key performance indicators provided in this report are based on a respondent base that may not fairly represent the wind industry in Canada. It has been deemed that the 24 percent response rate was not high enough to accurately portray all aspects of indicators, such as *employment* and *revenue*; therefore, certain data was removed from the report.

Prologue

Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008

The *Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008* is the first comprehensive report completed in partnership by Industry Canada, CanWEA, and KPMG on the Canadian wind energy sector. This profile is designed to provide a foundation for gathering and identifying key performance indicators that can ultimately be used to provide an objective assessment of the strength of Canada's current wind sector within the Canadian economy and the increasingly competitive global wind industry.

This initiative is in response to the need for current information on the state of the Canadian wind energy sector and will, over time, provide the business intelligence needed to encourage investment in Canada's wind sector. Potential investors, customers, policy makers, and other stakeholders will obtain some understanding of the economic impact and characteristics of the Canadian wind energy industry as of the end of 2008. Eight key performance indicators of the wind energy sector are evaluated: revenue, research and development, research partnerships, employment, sources of funding, level of investment, import/export trends, and forecast market dynamics.

Participation rates were not high enough to allow this paper to serve as a baseline for future analysis of the sector, but we wish to stress that both Industry Canada and CanWEA are committed to achieving a higher participation rate in future surveys. Only then will a solid foundation be built to fairly represent the wind industry. From this baseline, true analysis can be conducted, and trends and opportunities identified.

It is intended that the information provided in this report will be updated annually in order to highlight and benchmark the emerging key economic results, industry trends, and developments over time of a sector that is very important to the Canadian economy. Subsequent publications may be expanded to include three types of stakeholders: corporate, government, academia, and non-profit organizations. We thank all of the companies and organizations that contributed to the development of the *Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008*.

A response rate of 24 percent was obtained:

A total of approximately **420** organizations associated with the wind energy sector in Canada were invited to participate in the development of this profile. Organizations that chose to participate and be recognized are listed at the end of this report. These organizations were primarily private and publicly listed companies that are existing members of CanWEA. In total, **102** organizations responded, which represents an overall response rate of **24 percent**.

Executive Summary

On behalf of Industry Canada, KPMG undertook a survey of 420 Canadian wind energy organizations and 102 participants answered the survey between February 8, 2010, and March 10, 2010. The purpose of the study was to obtain information to develop a profile of the Canadian wind energy sector as at the end of 2008. The following report is a summary of findings from the survey respondents; however, based on the level of response, select data on employment, revenues, RD&D expenditures, and investments was excluded from this report.

The respondents of the working report were characterized by many private companies with less than 10 years of involvement in the industry. The hub of the Canadian wind energy industry was Ontario. Most organizations had their main location in Ontario and, on average, had another two locations in Canada or abroad. Companies in the Canadian wind energy sector were very much focused on the provision of services to the industry and the development of large wind turbine projects.

The responding organizations appeared well integrated with the global wind energy market from a procurement perspective, and more domestically focused from a commercial perspective. Canadian wind energy companies reported limited revenue from export activity and relied on Germany and the United States for the import of key components, such as generators and blades. This appears to be in line with respondents' statements that government-initiated international trade missions had been ineffective in increasing global market penetration for Canadian-based wind energy companies, and that legislation governing minimum Canadian content in domestic projects has had limited success to this point.

In 2008, those responding to the Canadian wind energy survey were characterized by a few large companies and a large group of small-sized, high-growth companies:

- 80 percent of revenue was created by 19 percent of the companies
- 71 percent of companies surveyed had less than 10 employees and employment activity was mainly centered on operations and technical work. However, 77 percent of responding companies indicated they were expecting to expand their workforce between 2008 and 2010
- 53 percent of companies had revenue of less than $1 million and an overwhelming majority expected their revenue to exhibit a CAGR of 10 percent or more between 2008 and 2010.

Finding the necessary skilled labour to support this expected growth may prove to be a key challenge for the industry in the short term. Stakeholders strongly believed there was a shortage of skilled technical labour in the industry.

The companies that responded to the Canadian wind energy industry survey were generally self-funded, with 62 percent of funds coming from operating cash flow. Of total dollar funding for wind-related initiatives, 16 percent was invested in wind-related machinery and equipment, and 20 percent was invested in RD&D activity. RD&D activity predominantly took place in Ontario and the United States.

There was a broad-based sentiment that the industry was expected to exhibit robust growth between 2008 and 2010. Sixty-seven percent of respondents believed the market would exhibit a high (10 to 25 percent CAGR) to strong level of growth (25 percent+ CAGR).

Respondents commented that further incentives and federal and provincial government-sponsored initiatives were required to continue growth in the Canadian wind energy market, to compete, and to level the playing field with larger trading partners, such as the United States, Germany, and China.

However, there continued to be challenges in the industry. Existing government policies, subsidies, and incentives were stated as both effective and ineffective growth drivers. The FIT Program, renewable power production incentives, tax incentives, and provincial procurement targets were viewed positively by respondents, whereas government trade missions, technology transfer funding and legislation governing greenhouse gas emissions, and minimal Canadian content were viewed by respondents as ineffective government initiatives.

Respondents stressed that grid access was a challenge for small to mid-sized companies in the Canadian market, and upgrades to the antiquated grid infrastructure in Canada were needed to improve access to the marketplace.

Overall, respondents consisted of small private companies focused on the provision of services and the development of large wind turbine projects. The sector was expected to see robust growth, but also faced a number of challenges. This report identifies labour and policy gaps that were perceived to exist in the industry and opportunities to leverage strengths in the Canadian wind energy sector and facilitate growth into the future.

Introduction

The *Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008* is the inaugural edition of an annual profile that provides objective insight into Canada's performance in a dynamic and important industry sector. This profile measures eight key performance indicators and provides an objective summary of findings from those who responded with respect to Canada's position within the globally competitive wind energy sector.

To create the profile, members of CanWEA were surveyed, between February 8, 2010, and March 10, 2010, for information relating to their performance in the year ending December 2008. Year ending December 2009 results were considered; however, public companies being polled were in the midst of filing FY2009 annual reports, which prevented disclosure of results for the year ending December 2009.

The economic profile summarized in this document is a reflection of the responses received from the 102 organizations that completed the survey and provided insight and commentary. Organizations that completed the survey include wind developers, operators, component and sub-component manufacturers, service firms, consultants, distributors, and research firms. It should be noted that this profile does not include many large players in the Canadian wind energy industry who did not respond to the survey or who were not surveyed, i.e. those who participate in the industry but are not members of CanWEA.

The 44 companies that provided revenue information appeared to be characterized by a few large companies; 80 percent of revenue was created by 19 percent of the companies. Fifty-three percent had revenues less than $1 million and 26 percent had revenues between $1 and $10 million. Revenue was driven by electricity generation into the grid, product sales, and services.

Seventy-one percent of companies had a 100 percent wind-dedicated workforce of less than 10 employees, and 7 percent had more than 50 employees who were 100 percent wind-dedicated. Most respondents expected employment to increase from 2008 levels over the next 2 years.

Forty organizations (40 percent of respondents) participated in RD&D activities in 2008. Fifty percent of organizations formed partnerships with other organizations to conduct 48 RD&D projects in 2008. RD&D was primarily funded by internal cash flow and most expenditures took place in Ontario.

Ten percent of respondents exported products to international destinations; these organizations relied on the export market for 98 percent of their revenue in 2008, with the United States a key export market for these export-dependent wind companies operating in Canada. Domestic demand was driven by customers in British Columbia, Quebec, and Ontario. Respondents had positive views on the provincial policy initiatives in Ontario and British Columbia, and suggested these two regions would be at the forefront of growth in the Canadian wind sector.

Respondents reported that funding was provided from multiple sources. Sixty-two percent of funding in 2008 came through internal cash flow or cash flow from other parts of the organization, while another 35 percent of funding was sourced from private equity, venture capital, and angel investors.

The surveyed sample at a glance for the year ending December 31, 2008, for the 102 respondents:

- Revenue was driven by electricity generation into the grid, product sales, and services
- Responding companies were mostly small to mid-sized entities
- 71 percent of respondents had a 100 percent wind-dedicated workforce of less than 10 employees and 7 percent had more than 50 employees
- 40 percent of respondents participated in RD&D activities
- 10 percent of respondents exported products
- 40 percent of respondents imported components
- 62 percent of operations were funded by internal cash flow.

Organization Profile

Organization type

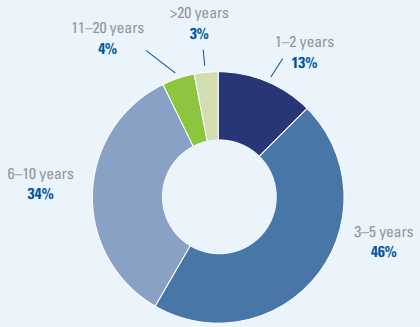
Stakeholder insights

Organizations responding to the survey on the Canadian wind energy industry were primarily private companies with less than 10 years of involvement in the industry.

On average, organizations responding to the survey had been involved in the Canadian wind energy sector for approximately 6 years, with 93 percent of companies in the wind industry for 10 years or less.

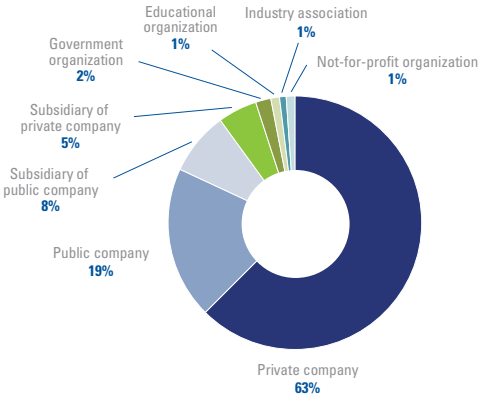
These organizations were primarily private companies (62 percent) involved in development (37 percent), manufacturing (22 percent), and services (32 percent). Companies that provide services to the wind energy sector were heavily geared towards providing construction, engineering, and maintenance services to the industry.

Years of involvement in the Canadian wind energy sector

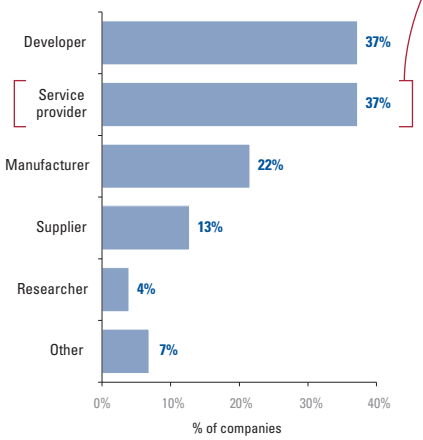


n=96

Organization type



Key business focus

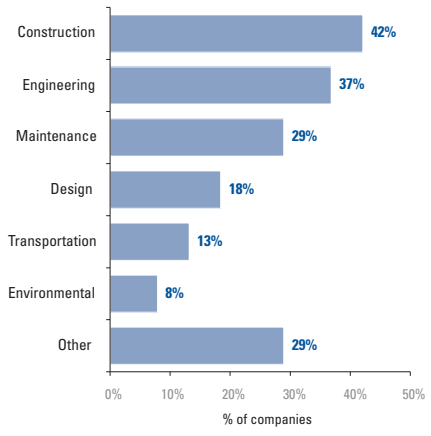


n=102

Note: *(i) Other: includes distributors, utility firms, and permit and approval agencies*

(ii) Companies were able to state more than one area of focus.

Key services offered



n=38

Note: *(i) Other: includes firms involved in testing, real estate consulting, financial services, software development, project management, public relations, real estate consulting, contract assessment, and economic analysis*

(ii) Companies were able to state more than one area of focus.

Region of activity and headquarters

Stakeholder insights

Ontario was the hub of the organizations that responded to the survey. Most companies had their main location in Ontario and, on average, had another two locations in Canada or abroad.

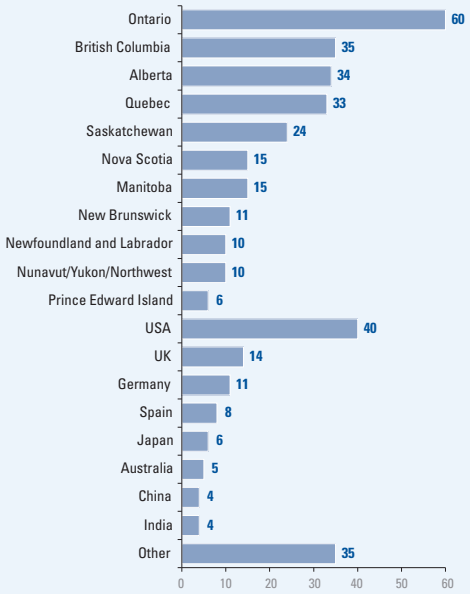
The wind energy sector in Canada has developed business clusters in Ontario, Quebec, British Columbia, and Alberta. Respondents reported 253 locations for wind energy facilities and activities in Canada in 2008.

Eighty-four percent of organizations that responded are Canadian-headquartered operations. Thirty-eight percent of these domestically-headquartered organizations also have operations internationally, with the United States being the most popular choice as a country for setting up international operations.

Canadian companies are headquartered in Ontario (46 percent), Quebec (13 percent), and British Columbia (10 percent).

Multinationals operating in Canada account for 15 percent of responding companies. These companies typically set up business locations in Ontario, Alberta, Quebec, and British Columbia to conduct business in Canada.

Business locations

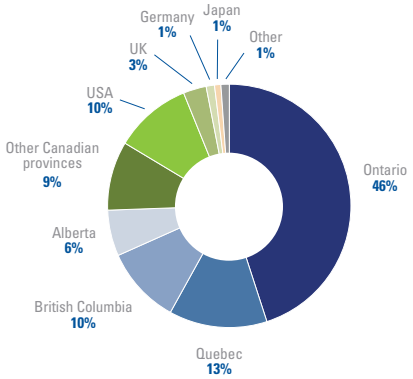


n=102

Note: (i) Other: includes countries such as Argentina, Bahamas, Belgium, Brazil, Chile, Estonia, France, Ghana, Indonesia, Ireland, Italy, Mexico, Middle East, Panama, Peru, Russia, Singapore, South Africa, Switzerland, The Netherlands, Turkey, and Vietnam

(ii) Companies were able to state more than one business location.

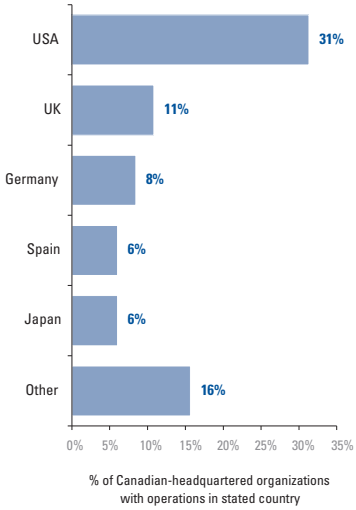
Headquarters



n=98

Note: (i) Other country is Sweden

International business locations of Canadian-headquartered organizations



n=83

Note: (i) Other countries include Argentina, Australia, Bahamas, China, Chile, Estonia, Ghana, India, Italy, Mexico, Middle East, Panama, Peru, South Africa, St. Lucia, Turkey, and Vietnam.

Market activity

Stakeholder insights

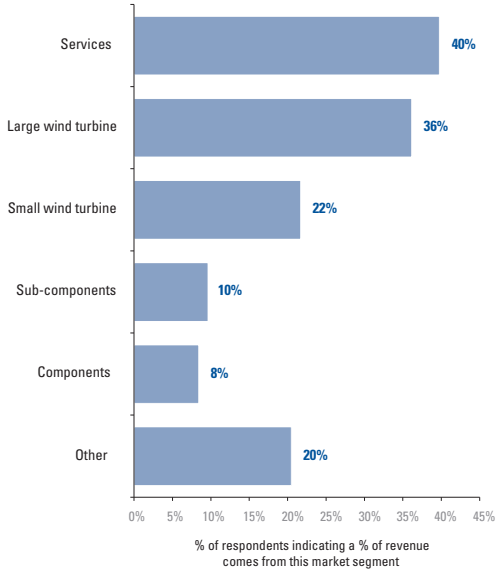
Respondents were characterized by companies involved in the provision of services to the industry and development of large wind turbine projects.

Respondent organizations in the Canadian wind energy sector worked across multiple markets, including services, large wind turbine projects, small wind turbine projects, components, and sub-component manufacturing and services.

Forty percent of organizations were involved in the service sector of the Canadian wind energy industry. The large wind turbine segment was a segment on which 36 percent of organizations were focused. Other areas of wind energy activity in Canada included small wind turbines (for 22 percent of organizations*), components, and sub-components, for 8 and 10 percent of organizations, respectively.

* This percentage seems over-represented in this respondent base relative to their estimated representation in the industry as a whole.

Market activity



n=83

Note: *(i)* ***Large wind turbines:*** *are large commercial wind turbines, such as those found in wind farms. These wind turbines have a rated capacity of 300 kilowatts or more*

(ii) ***Small wind turbines:*** *are wind turbines that have lower energy output than large commercial wind turbines, such as those found in wind farms. These wind turbines have a rated capacity of 300 kilowatts or less*

(iii) ***Components*** *are the rotor, nacelle, foundation, and tower*

(iv) ***Subcomponents*** *are blades, blade hubs, nose-cones, footings, ferrules, bed frames, main shafts, transformers, generator gearboxes, nacelle covers, etc.*

(v) Other includes software development, project assessment and due diligence, permits and approvals, underground transmission projects, energy sales, rental business, and wind testing

(vi) Companies were able to indicate multiple market sectors as sources of revenue.

Employment

Overview

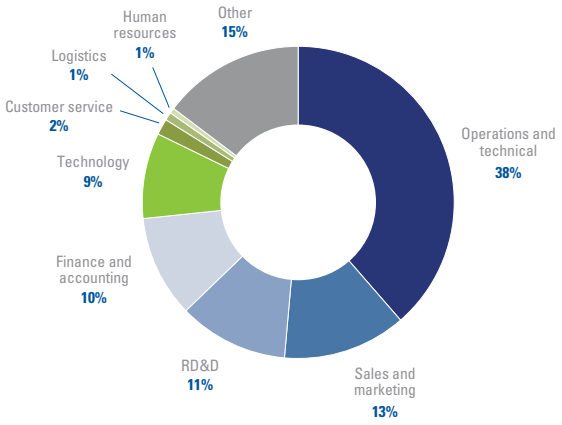
Stakeholder insights

Seventy-one percent of responding Canadian wind energy companies had less than 10 employees, and employment activity was mainly centered on operations and technical work. There was a shortage of skilled technical labour in the industry, and companies were expected to expand their wind-related workforce between 2008 and 2010.

Employees who were 100 percent dedicated to the wind energy sector worked in manufacturing (39 percent of the workforce), sales and marketing (13 percent of the workforce), and RD&D (11 percent of the workforce).

Seventy-one percent of companies had a 100 percent wind-dedicated workforce of less than 10 employees. Fifteen percent had 11 to 25 employees, 7 percent had 26 to 50 employees, and another 7 percent had more than 50 employees.

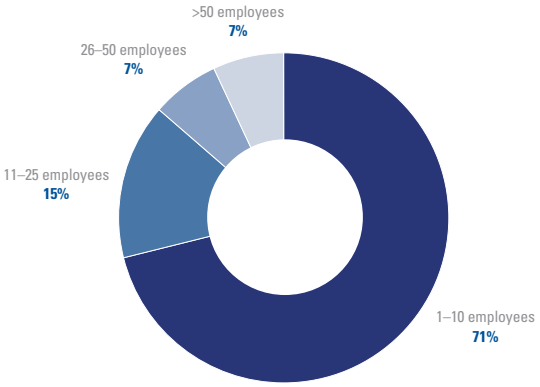
Employment by functional area



n=73

Note: (i) Other includes personnel involved in environmental assessment, project development, project development, technical engineering services, legal services, community relations, design, construction, and permit approvals.

Size of workforce



n=73

Shortage of skilled labour

Sixty-six percent of respondents believed there was a shortage of experienced and skilled labour in the wind energy sector. Key fields where a shortage of experienced and skilled labour was identified included specialist technicians, project managers, power engineers, and technology workers.

Forecast labour workforce dynamics

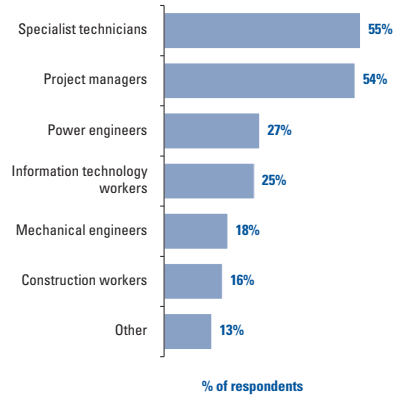
Though respondents stated skill and experience in the Canadian labour pool was lacking, most indicated they would expand their wind energy-related workforce over the next 2 years.

Seventy-seven percent of respondents indicated they were going to expand their workforce over the next 2 years;
47 percent of organizations planned to increase their workforce by 0 to 25 percent, 24 percent of organizations planned to increase their workforce by 26 to 50 percent, 11 percent planned to almost double their workforce over the next 2 years, and 18 percent planned on expanding their workforce by more than 100 percent.

Shortage of skilled labour

n=98

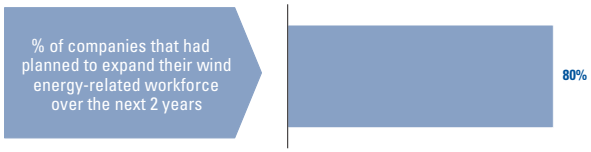
Key fields with a shortage of experienced and skilled labour



n=67

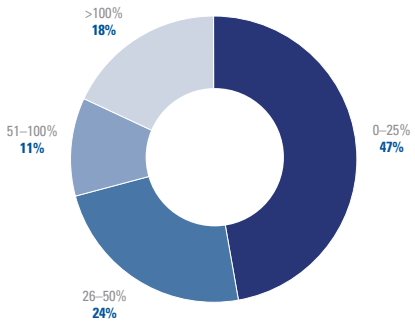
Note: (i) Other personnel include environmental impact assessors, welders, sales and marketing staff, tool and die makers, wind system installers, and construction managers.

Forecast labour workforce dynamics



n=99

Anticipated % increase in workforce size over next 2 years



n=55

Revenue

Stakeholder insights

Forty-four companies responded to questions on revenue. The majority of these 44 companies were small but growing organizations; 53 percent had revenue of less than $1 million, and an overwhelming majority expected their revenue to exhibit a CAGR of 10 percent or more between 2008 and 2010. This respondent base also appeared to be characterized by a few large companies; 80 percent of revenue was created by 19 percent of the companies that provided revenue information.

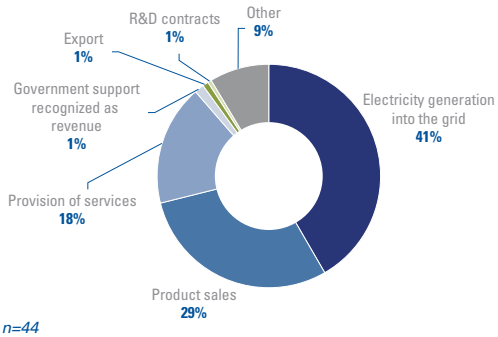
Approximately 60 percent of respondents participated in revenue generating activities in 2008. Forty-two percent of revenues came from electricity generated into the grid, 29 percent from product sales, and 18 percent from provision of services. Organizations also relied on other sources to generate 9 percent of revenue in 2008, which included revenue generated from wind power facility construction. Revenue from R&D contracts accounted for 1 percent of industry revenue from respondent companies. Further details on RD&D activity is provided on **page 11** of the report.

Companies were mostly small to mid-sized entities; 53 percent of responding companies had revenue of less than $1 million, 26 percent had revenue between $1 and $10 million, and 21 percent had more than $10 million in revenue. This respondent base appeared to be characterized by a few large companies; 80 percent of revenue was created by 19 percent of the companies that provided revenue information.

Seventy-four percent of respondents' revenue was generated by domestic operations. The top three provinces with the most wind energy-related revenue were Ontario at 25 percent, Quebec at 16 percent, and Alberta at 15 percent. Countries outside of Canada that accounted for the most wind-related revenue included the United States at 17 percent and the United Kingdom at 1 percent.

Sixty-eight percent of respondents indicated they expected revenue to exhibit robust (over 10 percent per annum) growth over the next 2 years. Thirty-two percent of respondents indicated revenue over the next 2 years would grow at between 11 and 25 percent CAGR, 12 percent indicated they expected it to grow at between 26 and 50 percent CAGR, and 26 percent indicated they expected revenue to exhibit a CAGR that exceeded 50 percent over the next 2 years.

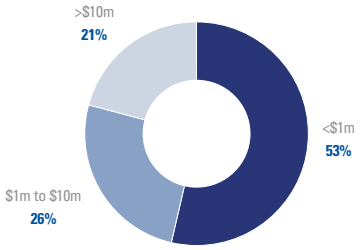
Revenue segmented by type



n=44

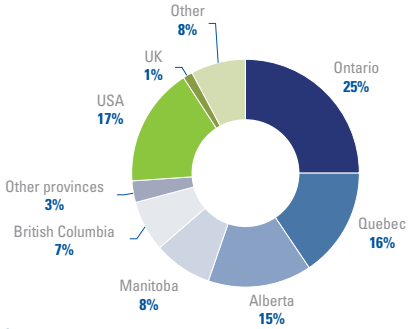
Note: (i) Other sources of revenue include construction, maintenance, testing, legal services, and environmental assessment.

Company size by revenue



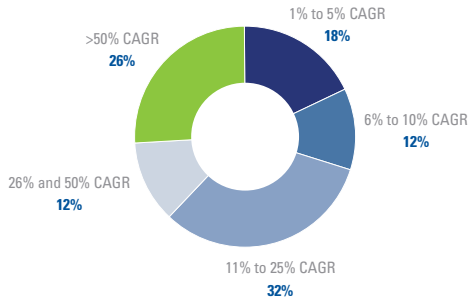
n=44

Revenue segmented by region of operation



n=44

Forecast revenue growth, 2008 to 2010 CAGR



n=44

Research, Development, and Demonstration (RD&D)

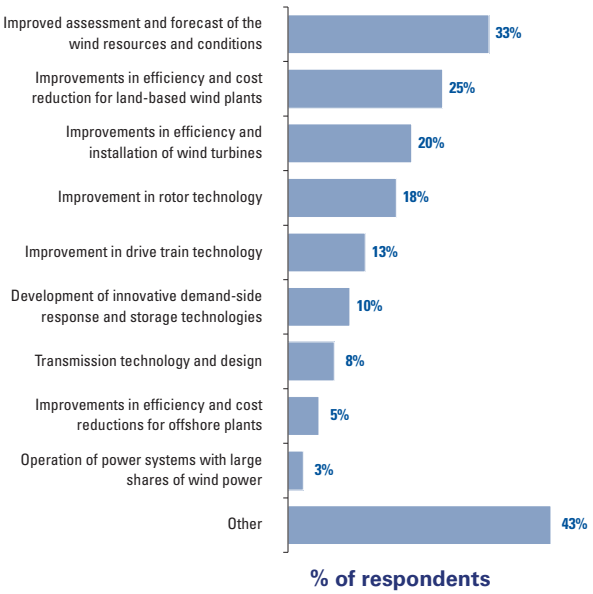
Stakeholder insights

Investment was made into RD&D in the Canadian wind energy sector respondent base. Seven percent of revenue was invested in RD&D in 2008. RD&D activity predominantly took place in Ontario and the United States.

RD&D activity

Forty organizations (40 percent of respondents) participated in RD&D activities in 2008. RD&D activity was focused around improved assessment and forecasting of wind resources and conditions (33 percent), improvements in efficiency and cost reduction for land-based wind plants (25 percent), and improvements in efficiency and installation of wind turbines (20 percent).

Research, development, and demonstration activity



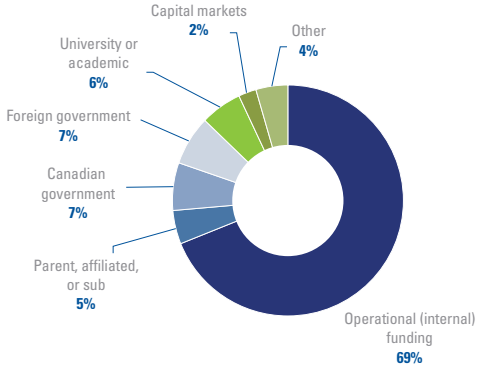
n=40

Note: (i) Other RD&D activities include environmental assessments, RADAR studies for birds and bats, generator manufacturing in 40 degree Celsius climates, LED lighting technology, component fabrication, coating technology, oil monitoring technology, helical anchor foundations, inverters, and control systems.

RD&D expenditures and funding

Ninety-three percent of expenditures were in R&D activities and 7 percent in demonstration activities. Sixty-nine percent of funding for expenditures on RD&D activities in 2008 came from revenue generated by the company's operations, while the rest came from the Canadian government (7 percent), foreign governments (7 percent), and universities or other academic institutions (6 percent).

Funding sources for RD&D



n=25

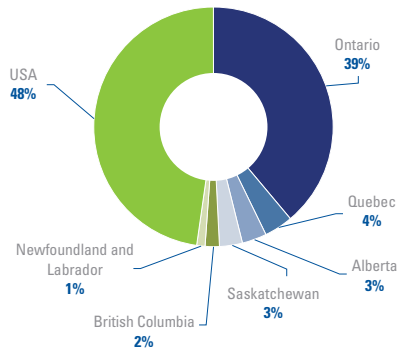
Note: (i) Other funding sources include venture capital and provincial government sources.

RD&D activity by region

Geographic data was provided for 91 percent of RD&D expenditures. Within Canada, Ontario led all regions with 39 percent of RD&D expenditures. Another 4 percent of RD&D expenditures occurred in Quebec.

However, Canadian firms were also active in research and development outside of Canada; RD&D activity conducted by Canadian companies in the United States accounted for 48 percent of total recorded RD&D expenditures.

RD&D by region



n=25

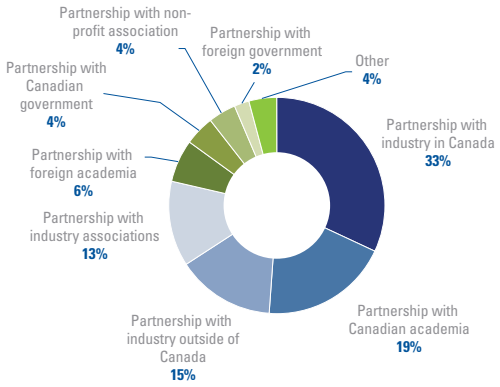
RD&D partnerships

Fifty percent of respondents who participated in RD&D activities in 2008 engaged in research partnerships with other organizations; therefore, 20 companies indicated engagement in research partnerships. A total of 48 research partnerships were formed in 2008, of which 15 (33 percent) were with industry in Canada, nine (19 percent) were partnerships with Canadian academia, and another seven (15 percent) were partnerships with industry outside of Canada.

RD&D partnerships

Number of partnerships	**48**

Types of RD&D partnerships formed



n=48

Note: Other partnerships include ones with a private enterprise (not specified as being in Canada or international) and a provincial/territorial government.

Funding and Investments

Funding sources

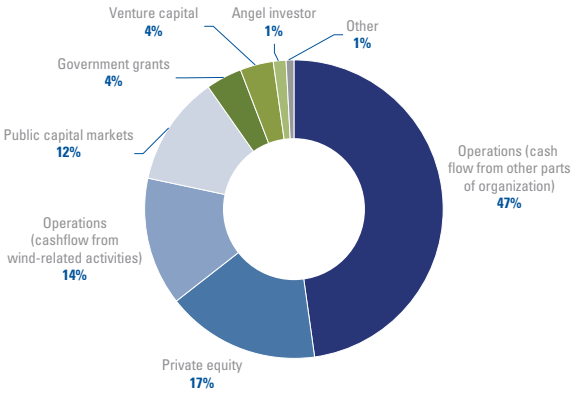
Funding on wind-related initiatives in 2008 was primarily driven by internal operating cash flow. Fourteen percent of funding was cash flow from wind-related activities, and another 47 percent of funding was cash flow from other parts of the organization.

Organizations in this respondent base of the wind energy sector also relied on private equity (17 percent), capital markets (14 percent), venture capital (4 percent), and government grants (4 percent) as other sources of funding for wind-related initiatives and activities undertaken in 2008.

Investments

The 37 organizations that provided insight into machinery and equipment expenditures indicated that, on average, 11 percent of their total expenditures on machinery and equipment were related to wind activity in 2008. Key pieces of machinery and equipment purchased by firms in the Canadian wind energy sector included CNC equipment, drilling and boring equipment, instrumentation devices, lifting equipment, meteorological towers, maintenance and tools, patterns/molds, safety equipment, testing equipment, tools, trucks, turbines, wind tower kits, and wind generators.

Sources of funding



n=41

Note: (i) Other sources of funding include R&D tax credits and private investors not classified as angel investors, private equity, or venture capital.

Stakeholder insights

Of the total dollar funding for wind-related initiatives in 2008, 16 percent was invested in wind-related machinery and equipment. Responding companies appeared to be self-funded, with 62 percent of funds coming from operating cash flow.

Imports/Exports

Stakeholder insights

Respondent companies in the Canadian wind energy sector were not export-focused and relied on Germany and the United States for the import of key components, such as generators and blades.

Import dynamics

Thirty-nine organizations (40 percent of respondents) indicated they imported wind-related components from outside Canada. These organizations imported approximately 72 percent of their components from outside of Canada and sourced the rest domestically.

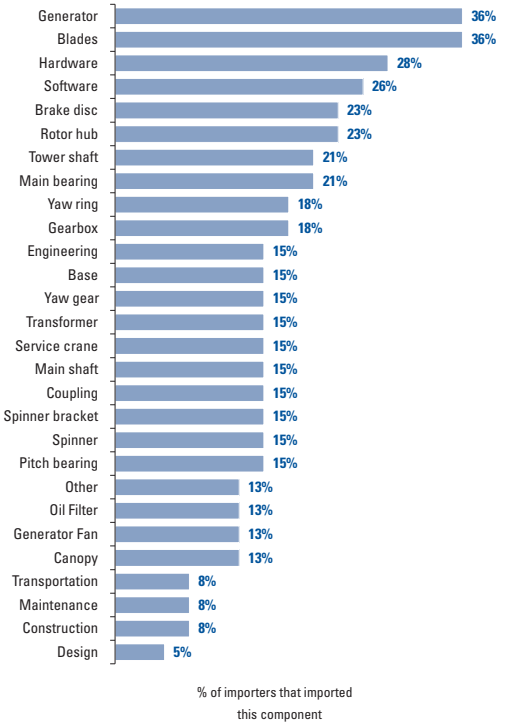
Organizations that imported components and services from abroad were principally developers involved with the large wind turbine market and manufacturers involved with the small wind turbine market.

Components that were most often imported from outside Canada included blades (36 percent of importers), generators (36 percent), and hardware (28 percent). These components were sourced mainly from the United States (49 percent), Germany (24 percent), India (9 percent), and China (7 percent).

Import dynamics

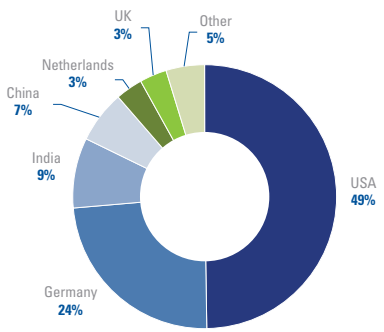
% of respondents who imported wind-related products/services outside of Canada	40%
% of components sourced from outside of Canada	72%

Components most often sourced from outside of Canada



n=39

Country of origin of components sourced from outside of Canada



n=158 citations of components being sourced from outside of Canada

Note: (i) Other countries of origin include Italy, Denmark, Finland, Japan, Poland, and Romania.

Export dynamics

Only 10 organizations (10 percent) indicated they exported product/services outside of Canada. However, organizations that exported wind-related components outside of Canada relied on these export markets for 98 percent of their revenue. These organizations tended to be manufacturers that served the small wind turbine market. Product and services that were most often exported to countries outside of Canada include generators (40 percent of exporters), tower shafts (30 percent of exporters), blades (30 percent of exporters), and engineering services (30 percent of exporters). These components were primarily exported to the United States, according to the respondents.

Export dynamics	
% of respondents who exported wind-related products/services outside of Canada	10%
% of revenue from international markets for Canadian companies that exported products/services	98%

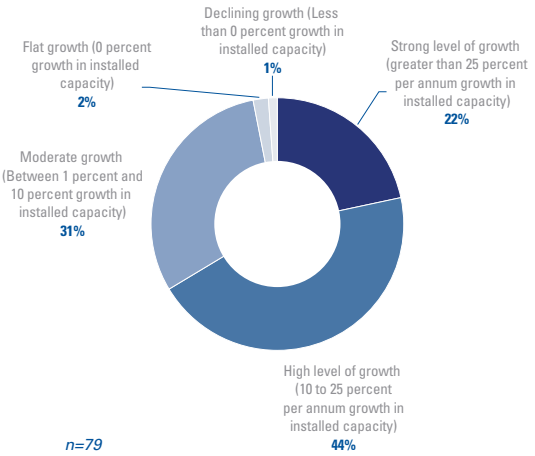
Forecast Performance and Market Dynamics

Market growth and drivers of growth

When prompted on expectations for forecast in the Canadian wind energy sector over the next 2 years, 67 percent of respondents believed the market would exhibit a high (10 to 25 percent CAGR) to strong level of growth (25 percent+ CAGR). Government incentives and subsidies (82 percent), government regulations (50 percent), and provincial procurement processes (43 percent) were seen by respondents as key drivers (top three) of growth between 2008 and 2010.

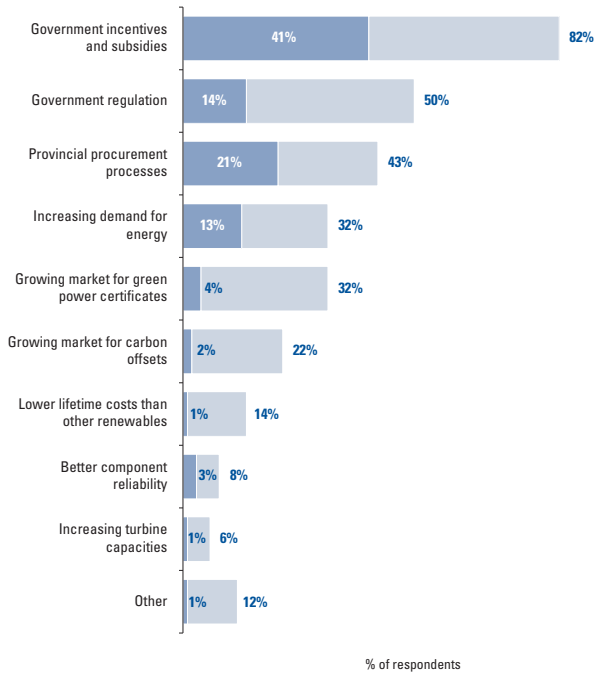
Forty-one percent of respondents indicated government incentives and subsidies as being the primary driver (number one) of growth between 2008 and 2010.

Market growth expectations over the next 2 years



n=79

Drivers of growth



% of respondents ranking it as the primary driver of growth
% of respondents ranking it as one of the top 3 industry drivers of growth

n=101

Note: (i) Other drivers of growth include access to capital, turbine costs, access to the electricity grid for small wind operators, consumer prices on renewable energy, long-term government initiatives. and Hydro Quebec strength.

Stakeholder insights

Respondents had commented that further incentives and government-sponsored initiatives were required to continue growth in the Canadian wind energy market. To compete and level the playing field with larger trading partners, such as the United States, Germany, and China, continued involvement by the federal and provincial governments along with attractive government subsidies was encouraged by stakeholders in the industry. Though Ontario has taken the lead in Canada with favourable feed-in tariff rates, commentators had suggested that other provinces needed to follow suit to continue growth in the Canadian wind industry.

The Ontario FIT Program was viewed by respondents as a positive development for the industry, and industry stakeholders believed that further refinement was necessary to attract investment in the small wind turbine industry.

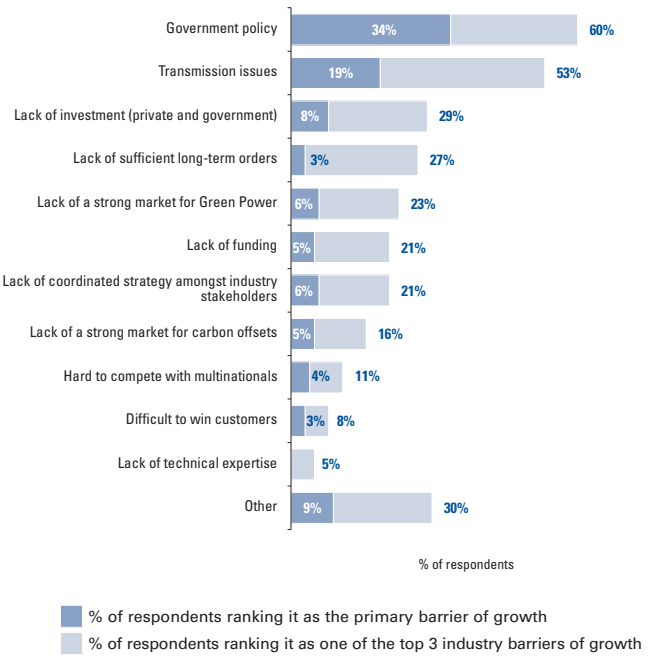
Barriers to market growth

Barriers limiting growth as reported by the Canadian wind energy sector respondent base continued to exist from the perspective of stakeholders in the industry. Not only was government policy seen as a key driver of growth, it was also considered a key barrier (top three), limiting growth amongst 60 percent of respondents. In fact, 34 percent of respondents viewed government policy to be the number one barrier limiting further growth.

Transmission issues were the second most cited issue, at 53 percent, and were expected to limit growth in the industry over the next 2 years. Respondents indicated that a lack of transmission access for wind power generation projects was a problem in the industry, and further indicated it was a direct result of minimum investment in transmission infrastructure and public ownership of the transmission model.

Comments were also made by respondents on public opposition towards the installation of wind farms in their region. These comments stated that, although public opinion appeared to support the development of renewable efforts, there continued to be symptoms of NIMBY.

Barriers to market growth



n=101

Note: (i) Other barriers to growth include a complex permit process; public opposition (NIMBY); access to capital; lack of subsidies; lack of protectionist policies; lack of provincial incentives outside of Ontario, Quebec, and British Columbia; and lack of a market for carbon offsets.

Government Policy, Subsidies, and Incentives

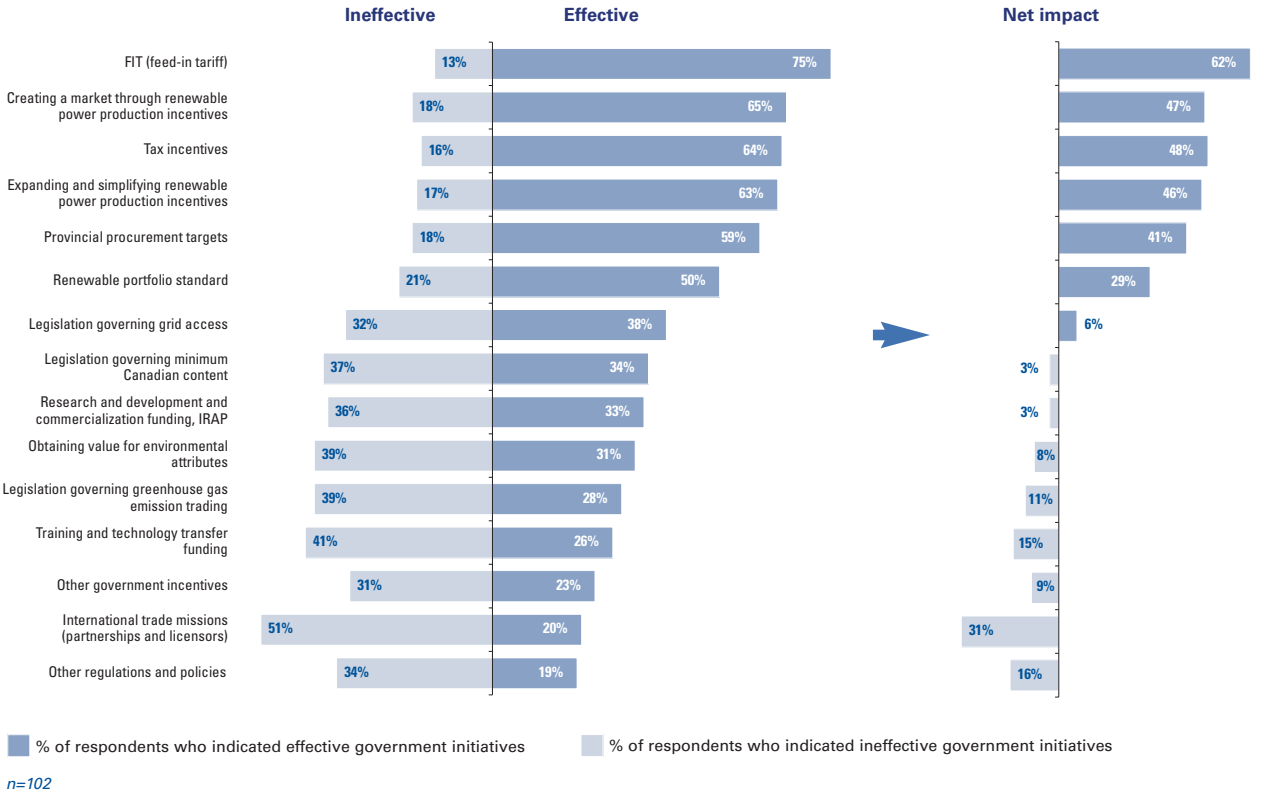
Government initiatives driving industry growth

Not all government policies, subsidies, and incentives were viewed positively by respondents; government initiatives were viewed as both a driver and a barrier to growth. The top five government incentives, regulations, and policies that were considered key drivers of growth included the FIT Program (75 percent), creating a market through renewable power production incentives (65 percent), tax incentives (64 percent), expanding and simplifying renewable power production incentives (63 percent), and provincial procurement targets (59 percent).

Government initiatives ineffective in driving industry growth

The top five government incentives, regulations, and policies that were considered ineffective in driving industry growth included international trade missions for partnerships and licensors (51 percent), training and technology transfer funding (41 percent), obtaining value for environmental attributes (39 percent), legislation governing greenhouse gas emissions trading (39 percent), and legislation governing minimum Canadian content (37 percent).

Government incentives, regulations, and policies



n=102

Stakeholder insights

Respondents stressed that grid access was a challenge for small to mid-sized companies in the Canadian market and upgrades to the antiquated grid infrastructure in Canada was needed to improve access to the marketplace for these organizations.

Though market participants stated that recently introduced government incentives, regulations, and policies, such as the FIT Program and renewable power production incentives, were effective, respondents stressed the need to expand on these programs to include incentives geared towards driving end market demand. A select number of small to mid-sized organizations commented on the difficulty in accessing and finding a market in Canada.

Conclusion

As of December 31, 2008, the 102 companies in the Canadian wind energy sector covered by this survey reported that:

- The sector primarily consisted of private companies involved in large wind turbine projects and the supporting services industry
- Most Canadian companies were headquartered in Ontario (45 percent of respondents) and were typically small firms with one to 10 employees
- Revenue was predominantly driven by electricity generated into the grid, product sales, and services
- Forty percent of respondents participated in RD&D activities in 2008. Fifty percent of respondents who engaged in RD&D activities conducted these activities in partnership with other organizations
- Funding on wind-related initiatives in 2008 was primarily driven by internal operating cash flow
- The Canadian wind energy sector in 2008 appeared to be a net importer, with 40 percent of respondents indicating they imported components from abroad and only 10 percent of organizations suggesting they exported components and products to international destinations
- The Canadian wind energy sector was expected to exhibit robust growth over the next 2 years; 67 percent of respondents believed the market would exhibit a high (10 to 25 percent CAGR) to strong level of growth (25 percent+ CAGR)
- Government policies, subsidies, and incentives were viewed as both effective and ineffective in driving industry growth. The FIT Program, renewable power production incentives, tax incentives, and provincial procurement targets were viewed positively by respondents, whereas government trade missions, technology transfer funding and legislation governing greenhouse gas emissions, and minimal Canadian content were viewed by respondents as ineffective government initiatives.

The Government of Canada, the Canadian Wind Energy Association, and KPMG would like to thank the organizations that took part in this survey. Their participation in this study enabled us to obtain a partial understanding of the economic impact of the wind energy sector in Canada and has provided some insight on overall investment, employment, R&D, and revenue in the industry. This information will provide the basis for future annual surveys through which we hope to ultimately establish a benchmark for tracking trends over time and obtaining the business intelligence needed to encourage investment in Canada's wind energy sector and provide policy makers with objective data related to the performance of the wind energy sector in Canada.

Methodology and response rates

The *Working Report on Industry Metrics for the Canadian Wind Energy Sector 2008* is the inaugural edition of a compendium of information on the Canadian wind energy industry.

A total of approximately **420** organizations associated with the wind energy sector in Canada were invited to participate in the development of this profile. Organizations that chose to participate are listed at the end of this report. These organizations were primarily private and publicly listed companies that are existing members of CanWEA. In total, **102** organizations responded, which represents an overall response rate of **24 percent**. Select data on employment, revenues, RD&D expenditures, and investments was excluded from this report due to the **level of response**.

The survey questionnaire aimed to capture financial, employment, R&D, import/export, and market information for calendar year 2008, and the survey itself was conducted in February 2010. Not all respondents provided information for every question asked.

All results are reported in aggregate to protect the confidentiality of respondents. No investigation was conducted as to the completeness of data provided by respondents or reasons for non-provision. All monetary results are presented in Canadian dollars.

Canadian Wind Energy Association

CanWEA is a national, not-for-profit association that works on behalf of our members to facilitate and promote the responsible and sustainable growth of wind energy in Canada. Wind energy is an important part of Canada's energy future, creating new investment and jobs in Canadian communities while also contributing to a cleaner environment for future generations. Established in 1984, CanWEA undertakes policy development and advocacy with different levels of government, implements a broad range of communications and outreach activities, and provides educational and networking opportunities for all stakeholders.

Industry Canada

Industry Canada's goal is to enhance the competitiveness of Canadian industry. The organization is responsible for maintaining channels of communication with key sectors to facilitate informed advocacy of industry interests in government decision-making and to convey the government perspective back to industry; analyzing the challenges and opportunities that face key sectors in the economy; developing policy options for possible government response to extraordinary challenges and opportunities; and delivering the subsequent program and services.

KPMG

KPMG has broad experience in understanding the wind power sector; we have established 12 dedicated Power & Utilities Centres of Excellence in key locations across the world to support companies in the wind power sector and to help meet their business challenges.

KPMG's access to a global network of wind energy sector practitioners, including financial and engineering professionals, can provide stakeholders in the wind energy sector with the latest sector knowledge, skills, resources, and technical developments. We continue to play an active role in the wind sector by conducting studies, sponsoring conferences, and participating in various other industry-related initiatives, such as taking leadership roles in presenting industry positions to authoritative bodies and government levels. Our goal is to become the trusted adviser to stakeholders in local, national, and global markets.

2008 Participants

3M Canada
Activa Environnement Inc.
Aeolis Wind Power
All Canada Crane
Altus Group
AMEC Americas Limited
Anemos Energy Corporation
Automatic Coating Limited
Barque Renewables
BelPacific Excavating And Shoring LP
Benign Energy Canada Inc.
Black & Mcdonald Limited
Carlsun Energy Solutions Inc.
Chinodin Wind Power
Cleanfield Energy
Composotech Structures Inc.
DLB Cranes Ltd
EHV Power
Electric Motor Service Limited
Emera Inc.
Endurance Wind Power Inc.
Enmax
Eocycle Technologies Inc.
Eon Windelectric
Erico International
Free Breeze Energy Systems Ltd.
Gilead Power Corporation
Golder Associates Ltd.
Great Lakes Wind Network
Groupe Collegia-Cégep De La Gaspésie Et Des Îles
Hemmera
Horizon Legacy Energy Corp
Hydac Corporation (Canada)
Ideal Gear And Machine Works Inc.
Innergex Renewable Energy Inc.
IPC Energy
Joss Wind Power Inc.
JP Pinard Consulting Engineer
Katabatic Power Corp.
Kinecor LP
Knight Piesold Ltd.
Magenn Power Inc.
Mcswain Manufacturing Corporation
Miller Thomson LLP
Mistaya Engineering Inc.
Naikun Wind Energy Group Inc.
Natural Power Consultants
Nextera Energy Canada
Northern Power Systems
NRG Systems, Inc.
Ortech Consulting Inc.
Parker Canada
Perwind Inc.
Premier Renewable Energy
Prometek Inc.
Prowind Canada
Redriven Power Inc.
Repower Systems Inc.
Robert B. Somerville Co. Limited
Saskatchewan Research Council
Shear Wind Inc.
Sherwood Electromotion Inc.
SKF Canada
Sky Generation Inc.
Sky Harvest Windpower Corp.
Sunforce Products Inc.
Technostrobe
Westsource
Williams Form Hardware And Rockbolt (Canada) Ltd.
Wind Dynamics Inc.
Wind Energy Institute Of Canada
Wind Simplicity Inc.
Windstream Energy

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