



- Wind Dividends: 2018 Update -

AN ANALYSIS OF THE ECONOMIC IMPACTS OF ONTARIO'S WIND ENERGY INDUSTRY



Presented to:



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1 DISCLAIMER

Disclaimer: This report was first published in 2015. *Wind Dividends – 2018 Update* reflects changes in planned wind energy procurement since the [original analysis](#).

The original report and the 2018 update were prepared by Compass Renewable Energy Consulting Inc. exclusively for the benefit and use of the Canadian Wind Energy Association. The work represents our best efforts and judgments based on the information available at the time each report was prepared. Compass is not responsible for the reader's use of, or reliance upon, the report, nor for any decisions based on the report. Compass makes no representations or warranties, expressed or implied. Readers of the report are advised that they assume all liabilities incurred by them, or third parties, as a result of their reliance on the report, or the data, information, findings and opinions contained in the report.

2 OVERVIEW

Ontario remains a national leader in wind energy development, with just over 5,000 MW of installed capacity as of August 2018, representing approximately 40 per cent of all installed wind capacity in Canada. Development of approximately 500 MW of additional installed wind energy capacity is ongoing.

Wind energy development provides significant economic benefits throughout project lifecycles.

Wind Energy in Ontario

Installed Capacity: **>5,000 MW**

Proportion of Canada's Installed Wind Capacity: **~40 per cent**

Additional Capacity Under Development: **~500 MW**

In 2015, the Canadian Wind Energy Association (CanWEA) commissioned Compass to comprehensively analyze the economic benefits of all wind energy development either completed, underway, or anticipated in the province, based on the procurement arrangements existing at that time.

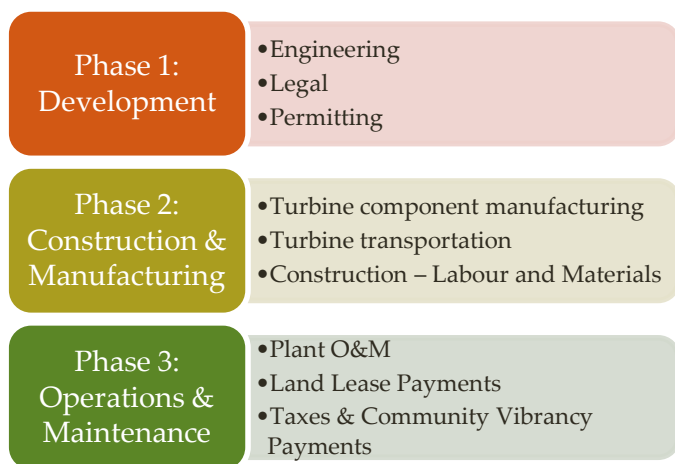
As both the previous and current provincial governments subsequently changed procurement plans for additional wind energy, in 2018 CanWEA commissioned Compass to update its analysis. The following quantifications of province-wide direct and indirect economic benefits are those associated with already-installed wind energy capacity, and with the additional ~500 MW of capacity that remained under development as of October 2018.¹ The analysis encompasses all economic benefits accruing within the 2006-2030 timeframe.

¹ Including uncompleted Large Renewable Projects that had achieved key development milestones and uncompleted Feed-In Tariff Projects that had received their notice to proceed.

3 ECONOMIC BENEFITS OF WIND ENERGY DEVELOPMENT

Wind energy development drives investment and creates employment and other economic benefits across all three main phases of a project’s lifecycle. A sophisticated supply chain is now well established in Ontario and includes professional services and component manufacturing used throughout the development and manufacturing phases of projects and employing thousands of Ontarians. Once in operation, wind energy development generates ongoing lease payments, tax and other direct revenue streams for municipalities, and wages and salaries.

Phase-Specific Sources of Economic Benefits



4 2018 UPDATED FINDINGS

Already-installed wind energy capacity, and the additional capacity that remains under development, totals 5,552 MW in Ontario. Looking at the 25-year period from 2006 to 2030 – during which all of that capacity will have achieved commercial operation – what follows are the total direct and indirect economic benefits associated with development and operation of Ontario’s wind generating capacity.

Economic Impacts from Ontario’s Wind Investments (2006-2030)

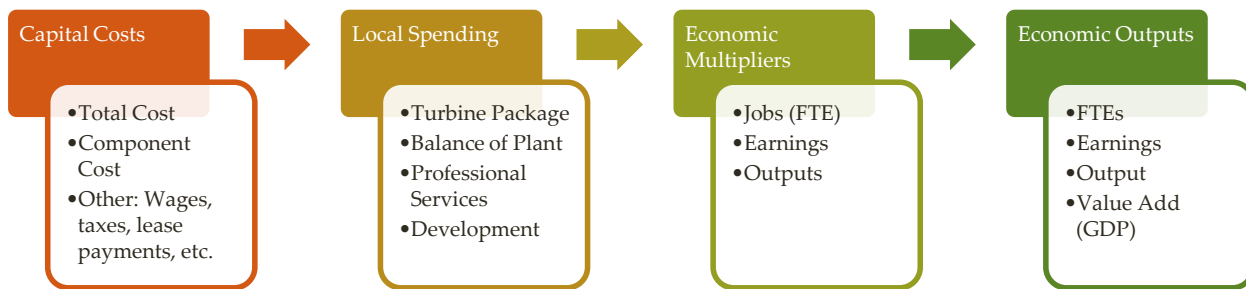
Direct and Indirect Full Time Equivalents* (FTEs)	64,500
Direct and Indirect Earnings	\$4.6 Billion
Direct and Indirect GDP	\$6.2 Billion
Total Investment	\$12.5 Billion

* Full Time Equivalents refers to full time employment for one year. One FTE = 2,080 hours.

5 APPROACH AND METHODOLOGY

The foregoing analysis uses the National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impact model (JEDI). This is an economic input-output model, and was used to estimate benefits based on total costs and the percentage thereof spent in Ontario. Compass conducted the analysis with reference to the specific structure of each of the various procurement rounds by which Ontario has added wind energy capacity, and with reference to both input from industry participants, and to other means of customizing the model to Ontario. The mechanics of the model are summarized below. Readers are referred to the original report from 2015 for more about the model and methodology, and of its application and limitations in the specific context of this analysis.

Jedi Model Mechanics



6 APPENDIX ONE: 2015 PUBLISHED REPORT VERSUS 2018 UPDATE – SUMMARIES

6.1 2018 Update Summary: Economic Benefits of Wind Energy in Ontario

	2006-2012	2013-2019	2020-2030	Total
FTEs	13,900 FTEs	35,400 FTEs	15,200 FTEs	64,500 FTEs
Earnings Direct and Indirect	\$1.1 Billion	\$2.6 Billion	\$0.9 Billion	\$4.6 Billion
GDP Direct and Indirect	\$1.3 Billion	\$3.2 Billion	\$1.7 Billion	\$6.2 Billion
Total Investment	\$4.8 Billion	\$7.7 Billion	--	\$12.5 Billion

6.2 2015 Published Report Summary Versus 2018 Update Summary: Change in Impacts

	2015 Summary	2018 Update	Change*
MW Being Evaluated	6,480 MW	5,552 MW	-928 MW
Time Frame	2006-2030	2006-2030	N/A
FTEs	73,000 FTEs	64,500 FTEs	-8,500 FTEs
Earnings Direct and Indirect	\$5.1 Billion	\$4.6 Billion	-\$0.5 Billion
GDP Direct and Indirect	\$7 Billion	\$6.2 Billion	-\$0.8 Billion
Total Investment	\$14 Billion	\$12.5 Billion	-\$1.5 Billion

* Change calculated based on reported, rounded figures in 2015 published report, not unrounded numbers in the 2015 detailed analysis

7 APPENDIX TWO: DETAILED ANALYSIS – 2015 VERSUS 2018

7.1 2015 Detailed Analysis Versus 2018 Detailed Analysis: A Closer Look at the Net Loss of Economic Activity

	2006-2012	2013-2019	2020-2030	Total
FTEs	--	6,300	2,400	-8,700*
Earnings Direct and Indirect (\$ Millions 2015)	--	\$500	\$100	-\$600*
GDP Direct and Indirect (\$ Millions 2015)	--	\$600	\$200	-\$800
Total Investment (\$ Millions 2015)	--	\$1,800	\$100	-\$1,900*

* These are unrounded analysis numbers. The discrepancies with the totals in the table in sections 6.2 (Change column) are due to the rounding down of totals in the 2015 published report (2015 Summary column in section 6.2).

7.2 2018 Detailed Analysis: Excludes MW for cancelled LRPI, LRP II & III and attrition for a total of 5,552 MW

	2006-2012	2013-2019	2020-2030	Total
FTEs	13,900	35,400	15,200	64,500
Earnings Direct and Indirect (\$ Millions 2015)	\$1,100	\$2,600	\$900	\$4,600
GDP Direct and Indirect (\$ Millions 2015)	\$1,300	\$3,200	\$1,700	\$6,200
Total Investment (\$ Millions 2015)	\$4,800	\$7,700	--	\$12,500

7.3 2015 Detailed Analysis: MW for this analysis included LRP II & III for a total of 6,480 MW

	2006-2012	2013-2019	2020-2030	Total
FTEs	13,900	41,700	17,600	73,200*
Earnings Direct and Indirect (\$ Millions 2015)	\$1,100	\$3,100	\$1,000	\$5,200*
GDP Direct and Indirect (\$ Millions 2015)	\$1,300	\$3,800	\$1,900	\$7,000
Total Investment (\$ Millions 2015)	\$4,800	\$9,500	\$100	\$14,400*

* These are unrounded analysis numbers. The discrepancies with the table in section 6.2 (2015 Summary column) are due to the rounding down of these figures in the 2015 published report.