

# Renewable Energy Policy and Wind Generation in Ontario

## EXECUTIVE SUMMARY

- Wind generation has grown rapidly to become a significant contributor to Ontario's electricity generation over the past decade, accounting for 6% of total generation production and 10% of installed capacity in 2015.
- Despite a stated goal of streamlining renewable energy development, the 2009 Green Energy and Green Economy Act has increased the time required for projects to achieve commercial operation by some measures. The average development time for an operating wind project in Ontario after receiving a contract to sell electricity from the Ontario Power Authority before the 2009 Act was 29.1 months, in comparison to 41.1 months for those contracted after the Green Energy and Green Economy Act.

As energy policies in many jurisdictions have shifted towards finding environmentally sustainable ways to produce energy, there has been a rise in the focus on renewable power generation technologies. In Ontario, the government first publically announced renewable power targets in 2003 and began its first renewable energy supply program in 2004. The government subsequently enacted the Green Energy and Green Economy Act (GEA) in 2009 to promote more and faster development of renewable energy projects. This included streamlining project construction and application processes, establishing a feed-in-tariff (FIT) program with guaranteed prices under long-term contracts, and creating a Renewable Energy Approval (REA) process that exempted some projects from requirements for approval under existing legislation.<sup>1</sup> Together, these measures were intended to incentivize the development of renewable energy technologies, create new jobs, and attract private investment. In the following years, interest in renewable electricity generation capacity and the importance of wind power both for electricity generation and in public debate has grown dramatically in Ontario.

The purpose of this Policy Brief is to assess whether the GEA had a measurable impact on the duration of regulatory approval processes by centralizing them in the provincial government and limiting the power of municipalities. In an effort to quantify the impact of renewable energy policies on the growth of the wind power sector in Ontario, the Ivey Energy Policy and Management Centre has undertaken a data collection project with the goal of capturing project development information for every proposed, operating, withdrawn, or cancelled

<sup>1</sup> See Green Energy and Green Economy Act, 2009, S.O. 2009, c. 12 - Bill 150, May 14, 2009, <http://www.ontario.ca/laws/statute/s09012> and Mulvihill, et al., 2013.

onshore, commercial wind power project in Ontario.<sup>2</sup> This report summarizes the main insights that emerge from the construction of a database following all such identifiable projects through the regulatory process, construction, and operation stages. The resulting database is unique and can be used for a variety of policy, project financing, and project feasibility studies.<sup>3</sup>

## ONTARIO RENEWABLE ENERGY POLICY

The Government of Ontario first announced renewable power targets in 2003 of 5% of the province's electricity generation capacity, approximately 1350 MW, to be achieved by 2007. In 2004, the Ontario Power Authority announced the first round of Request for Proposals (RFPs) for renewable energy capacity under the Renewable Energy Supply (RES) program. Additional rounds occurred in 2005 (RES II) and 2007 (RES III). The resulting wind power generation contracts yielded average rates of \$0.08-0.09/kWh for RES contracted suppliers.<sup>4</sup> An additional program, the Renewable Energy Standard Offer Program (RESOP) was launched in November of 2006 to encourage the development of smaller projects with a size limit of 10 MW per project. The RESOP paid \$0.11/kWh under a 20-year contract and limited the time to bring a contracted project into operation to 3 years. However, RESOP was suspended in 2008 when it fell short of meeting the 2007 generation target, with only about 60% of the 1350 MW initial target for renewable power generation capacity achieved by the end of 2008. While the RESOP program had attracted a significant number of applications from renewable energy developers, local communities and municipal councils in some areas had vigorously resisted local zoning approvals. In addition, instead of attracting the intended target of small developers, contracts granted under the RESOP program were often awarded to commercial developers dividing projects into smaller parcels in order to meet eligibility requirements.<sup>5</sup>

Subsequently, the Green Energy and Green Economy Act was enacted in 2009 to address many of the perceived problems under the RES programs and RESOP. The Feed-in-Tariff (FIT) program replaced RESOP, offering qualifying projects stable energy purchase prices under 20-year contracts for energy generated from renewable sources, including wind power projects. The program was heralded as "North America's first comprehensive feed-in tariff program for renewable energy" and began accepting applications in October 2009.<sup>6</sup> In Ontario the FIT program was initially open to projects with a generating capacity of at least 10 kW (projects of less than 10 kW were eligible for the microFIT) program, and included domestic content requirements that were intended to foster a 'green' supply chain in the province. The FIT price schedule for wind projects changed five times between 2009 and 2015 with base prices ranging from 11.5-13.5 cents per kilowatt-hour and additional "price adders" for projects with community, Aboriginal, and public sector equity participation. (See Table 1.)

---

<sup>2</sup> There is no single comprehensive database that tracks the development of Ontario wind turbine projects, and existing sources often have conflicting data. For example, according to the Canadian Wind Energy Association, in 2015 Ontario wind generation comprised 79 installed projects. However, 2015 data from the IESO identifies 93 commercially operating, contracted wind generation projects. Other measures of wind development include 84 projects with Feed-in-Tariff (FIT) contract offers, 69 projects that have submitted Renewable Energy Approval (REA) applications, 164 projects in various stages of development identified in a 2009 Ontario Power Authority survey, or over 300 proposed projects according to some Ontario wind resistance groups.

<sup>3</sup> Christidis and Law (2013) describe an effort to compile similar data for preexisting wind farms and create a map for use in environmental health research. The paper includes discussion of inconsistencies across publically available Ontario wind farm data and maps available in other jurisdictions.

<sup>4</sup> See Holburn, Lui, and Morand, 2010.

<sup>5</sup> See Holburn, Lui, and Morand, 2010.

<sup>6</sup> Projects under 500kW and in-service on October 1, 2009 were eligible to transition to FIT contracts as well.

Table 1: Feed-In Tariff Prices for On-shore Wind Projects

Effective Date	Project Size	Contract Price	Aboriginal Price Adder	Community Price Adder	Municipal/Public Sector Adder	Escalation Percentage
9/2009 – 4/2012	Any	13.5	1.5	1.0		20%
4/2012 – 8/2013	Any	11.5	1.5	1.0		20%
8/2013 – 12/2013	Any	11.5	1.5	1.0	1.0	20%
1/2014 – 9/2014	<= 500 kW	11.5	1.5	1.0	1.0	20%
9/2014 – 12/2015	<= 500 kW	12.8	1.5	1.0	1.0	20%

**Notes:** Prices are in cents per kilowatt-hour.

Price adders are maximum allowable amounts and determined on equity participation.

Escalation percentage is based on the Consumer Price Index.

**Source:** IESO, FIT Price Schedule.

Three rounds of FIT contract offers were made between 2009 and 2015, designated as FIT 1, FIT 2, and FIT 3, respectively.<sup>7</sup> Applicants who were not awarded contracts due to limited transmission capacity were ranked and continued to be eligible in the future. The timing of FIT contract offers has been idiosyncratic with new contracts offered as new transmission capacity became available or in accordance with ministerial directives or other events. For example, in July 2011 new contracts were offered to some previous applicants based on their priority ranking due to the new Bruce-to-Milton transmission line coming into service. While little data is available on the development of projects prior to receiving generation contract offers, capacity allocation is clearly a significant hurdle in the development process. In the Bruce transmission area, 30-50 projects appear on the priority ranking lists from 2010-2011 awaiting capacity allocation. Across all transmission areas during this period, approximately 115 different on-shore wind applications for FIT contracts appear on the priority rankings that are not subsequently offered FIT contracts.

The GEA also gave Ontario's Minister of Energy substantial latitude to determine policies to expand renewable energy development in the province, including determining the type of procurement process and pricing, among other factors. Each round of contract offers introduced new "versions" of FIT. Together with smaller changes in rules, contracts, and definitions there were approximately 16 changes to the FIT program that led to the issuance of new written FIT rules, contracts, and/or definitions between September 2009 and December 2015. However, in October 2011 a major review of the FIT program was announced that halted consideration of new contracts. While previously awarded contracts would continue under the existing FIT rules, all other applicants would be subject to new FIT program rules after the review was completed. As a consequence, prior applicants not yet awarded a contract were allowed to withdraw their applications with a refund of fees paid. The stated purpose of the review was to balance the interests of ratepayers with the need to encourage investment and specifically to consider issues such as possible FIT price reductions, long-term sustainability of procurement, new technologies and fuel sources, and the role of local consultations in the renewable approval process. The results of the review were publicized in March 2012 with the following recommendations to be implemented: further streamlining the regulatory process, reducing FIT prices by 15% for wind, creating a priority point system for Aboriginal participation and municipal support, and setting aside a portion of transmission capacity for projects with

<sup>7</sup> A fourth round of contract offers (FIT 4) occurred in June 2016 and a fifth round is planned for 2017.

## Policy Brief

### Renewable Energy Policy and Wind Generation in Ontario

significant Aboriginal or local community participation. In addition, discussion of developing a new competitive renewable energy procurement process for large projects began with projects of 10-500kW continuing under the existing, albeit revised, FIT program. However, only one on-shore wind project was awarded a FIT contract from 2012 to 2015.<sup>8</sup> In total, through the end of 2015, FIT contracts were offered to 84 onshore wind generation projects with 58 in 2010 (FIT 1), 25 in 2011 (FIT 1), and 1 in 2014 (FIT 3).<sup>9</sup>

The new provisions for local or Aboriginal support were important since the OPA was required by ministerial directive to contract projects with priority points ahead of all other projects, and to not contract any projects without at least one priority point.<sup>10</sup> In addition, the minister directed that in the first round of contract offers after the program review (FIT 2) 100MW of the planned 200MW to be awarded would be set aside for Aboriginal and community participation projects. In fact, 95% of successful applications in FIT 2, when no FIT contracts were awarded for wind generation projects, contained municipal council support resolutions, suggesting a real effect of these changes.

The second major change instituted by the GEA was to streamline approvals for renewable energy projects with the establishment of the Renewable Energy Approval (REA) program, which exempted FIT projects from municipal planning approval requirements. After the enactment of the GEA, renewable energy projects were no longer subject to the Environmental Assessment Act or land use planning restrictions, such as zoning by-laws, under the Planning Act. Instead certain classes of wind projects were required to meet environmental regulations under the Ministry of Environment's new REA process, which integrated many of the previous regulatory approval requirements and provided a six-month service guarantee per project. Wind facilities under 3 kW, called Class 1 facilities, did not require an REA. Facilities between 3 and 50 kW, Class 2 facilities, had simplified REA requirements and did not need to meet noise, property, and road or rail setbacks. Wind facilities of more than 50 kW (Class 3 or 4) had to meet the REA requirements as well as setbacks based on noise levels and proximity to water, natural and cultural heritage sites, property, roads, and rail. Any resident of Ontario can challenge the issuance of a REA by appealing to the independent Environmental Review Tribunal. The appellant must file a Notice of Appeal with the Tribunal within 15 days of the REA decision and generally be ready for an initial hearing within 30 days. The Tribunal is required to render a decision within six months of the appeal, with limited exceptions, or the REA is deemed to be confirmed. Thus, the REA process is designed to make expeditious decisions that are burdensome to overturn.

The apparent trend in Ontario beginning in 2003 and continuing through 2015 has been to incentivize private development of renewable electricity generation by increasing contracted rates, providing long-term purchase agreements, and streamlining regulatory requirements. However, anecdotal evidence suggests that these measures were less effective than anticipated. In February of 2011, the OPA allowed one year extensions to existing FIT contracts in response to feedback from developers and the government that more time was needed to achieve commercial operation due to the time required to prepare complete submissions and obtain regulatory approvals, despite guarantees of a six-month approval timeline for the REA. Determining whether these policies have had the intended effects and assessing criticisms against them, requires the availability of comprehensive data on

---

<sup>8</sup> Additional wind power contracts were awarded under FIT 4 on June 29, 2016, including 6 on-shore wind projects. See IESO Contract Offers at <http://fit.powerauthority.on.ca/program-updates/contract-offers>. A final round, FIT 5, has completed its application period and contract offers are expected in 2017.

<sup>9</sup> Since 2014 projects of 500 kW or more are subject to a new, competitive bidding process, the Large Renewable Procurement (LRP). The first round of contracts under this program was executed in April of 2016 with 5 wind contracts awarded totaling 299.5 MW and a weighted average price of \$0.86/kWh.

<sup>10</sup> Projects were also granted 1 priority point for having initially applied to FIT before July 4, 2011 or for being a water or bioenergy project.

the development process and related project characteristics. If the GEA has been successful in the stated goal of promoting more and faster development of renewable energy projects, then analysis of such data should show faster regulatory approvals and higher rates of proposed projects achieving regulatory approval, reflecting overall lower levels of regulatory uncertainty and delay.

## ONTARIO RENEWABLE ENERGY GENERATION APPROVALS PROCESS

The renewable energy generation development process in Ontario is complicated by the involvement of multiple agencies and different criteria depending on characteristics of the proposed project. However, there are three major regulatory hurdles most commercial projects face between proposal and construction, in addition to securing a contract to sell electricity. These are obtaining a Connection Assessment Approval (CAA) for connection to the Ontario electricity grid from the IESO (or the Ontario Power Authority (OPA) prior to their merger on January 1, 2015), obtaining an environmental assessment from the Ontario Ministry of the Environment, and obtaining a generation license from the Ontario Energy Board (OEB).<sup>11</sup>

The CAA process assesses the impact of new connections on the power system and only assesses technical aspects of a proposed project. Consequently, this stage of the regulatory process has remained essentially the same for projects proposed before and after the GEA. However, for projects proposed after the GEA, connection assessments had to be initiated after obtaining a FIT contract. In contrast, projects were encouraged to begin the connection assessment process prior to submission of an RFP under the RES program.

The environmental assessment phase includes reviews of the suitability of the project location and construction plans, as well as adequacy of municipal, community and Aboriginal consultations. Prior to the GEA, environmental assessments for renewable energy projects in Ontario were handled in the same way as other electricity generation projects under the Environmental Assessment Act, through the Ministry of the Environment. In addition, project proponents were required to obtain municipal permits and approvals for land use and construction under the Planning Act. After the passage of the GEA, renewable energy projects were subject instead to a new, ostensibly streamlined process, the REA, for generation projects of 3 kW or more.

Finally, all projects generating 500kW or more are required to obtain a generation license from the Ontario Energy Board. This process has also remained essentially the same for projects proposed before and after the GEA, although the licensing application has been somewhat streamlined for FIT contracted projects. For projects proposed after the GEA the typical project would obtain a FIT contract followed by a CAA and REA. Once the CAA and REA were obtained a "Notice to Proceed" (NTP) would be requested from the IESO/OPA, which is required to apply for a generation license.<sup>12</sup> Typically, construction would begin after the generation license is secured. By contrast, prior to the GEA, the CAA or other system assessment would occur prior to obtaining a contract to sell electricity, but otherwise the progression of approvals was largely the same, with the addition of municipal land use and permitting.

---

<sup>11</sup> Projects under 10 MW do not require a CAA but generally require other types of grid impact assessments.

<sup>12</sup> A Notice to Proceed also requires provision of an acceptable Domestic Content Plan and Financing Plan.

## WIND GENERATION DEVELOPMENT IN ONTARIO

Since the first announcement of renewable power targets in 2003, electricity generated by wind power has grown in Ontario from essentially zero capacity to 10% of installed capacity and 6% of total generation production in 2015. Yet the effect of the Green Energy and Economy Act on its growth is debated. This section uses metrics such as the duration of the total regulatory process before and after the GEA and that of the comparable stages to evaluate its success in driving more and faster development of renewable energy projects, using data collected on proposed commercial wind generation projects.

In total, 252 new wind power projects were identified from data collected primarily from OPA FIT contract award and priority application lists, the REA Renewable Energy Projects Listing, OEB Electricity Generator Issued License data, IESO Application Status data, the Ontario Environmental Registry, and Canadian Wind Energy Association (CANWEA) Installed Capacity list. To be included as a “project” a proposed wind generation undertaking must have been a FIT, RES, or RESOP eligible onshore, commercial wind power project beginning the regulatory process in Ontario by December 31, 2015. This includes submitting an application that was withdrawn before approval or rejection. However, the population of projects identifiable from each of the sources named differs. For example, CANWEA’s installed capacity list is constructed from member reported maximum capacity. In contrast, capacity data from the IESO is generally based on a generator’s contracted capacity. Thus, constructing a complete data set across the decade of development and multiple regulatory regimes was difficult.

From the set of identified projects, 116 had active contracts to sell electricity with a subset of 93 in commercial operation at the end of 2015 (See Exhibit 1). The 23 projects with active contracts not in commercial operation were still under development at that time (See Exhibit 2). Contracts are considered to be active by the IESO, if a contract from the OPA to sell electricity has been accepted by the developer and has not expired or been cancelled. An additional 28 projects were offered FIT contracts that were not exercised. All other projects applied for contracts to sell electricity prior to the end of 2015 but have not been granted one to date.

One way to potentially assess the effect of the GEA in streamlining renewable generation development is to analyze whether the projects are approved at higher rates or in shorter periods of time since its enactment. Fifty (43%) of the projects with active contracts applied for or obtained a contract to sell electricity before the GEA (pre-GEA) and the remainder after (post-GEA). Table 2 provides a breakdown of projects with active contracts by contract type and stage of development. All of the 50 pre-GEA contracted projects are currently operating with 15 active RES and 35 active RESOP (standard offer) wind generation projects. Of the 65 post-GEA projects, 59 have active FIT contracts with 39 currently operating. The remaining 6 projects are part of the Green Energy Investment Agreement (GEIA) with Samsung C&T Corporation and Korea Electric Power. The GEIA was mandated by ministerial directive in April of 2010 and provided for development of 2,500 MW of wind and solar renewable generation projects in Ontario in five phases.<sup>13</sup>

---

<sup>12</sup> Consequently, sample sizes vary for the sample statistics presented and are not fully comparable.

<sup>13</sup> To date, these projects include Grand Renewable Energy Park, South Kent Wind, K2, and Armow. They receive the FIT price and are subject to the same regulatory processes as FIT contracted projects.

Table 2: Number of Projects with Active Contracts by Contract Type and Stage of Development

Contract Type	Contract Status as of December 31, 2015			Total
	Operating	Obtained Notice to Proceede	In Development	
FIT 1	39	8	11	58
FIT 3	0	0	1	1
GEIA	4	0	2	6
RES I	4	0	0	4
RES II	6	0	0	6
RES III	5	0	0	5
RESOP	35	0	0	35
<b>Total</b>	<b>93</b>	<b>8</b>	<b>14</b>	<b>115</b>

Looking at the average time in months from accepting an IESO contract to sell electricity until beginning commercial operation for all operating projects before and after the enactment of the GEA, the data show significant differences (See Table 3). Prior to the GEA, the average duration for successful projects was 29.1 months and after the GEA the average was 41.1. However, the variation in approval durations was somewhat smaller post-GEA as shown by the smaller standard deviation. A similar pattern emerges considering the time to commercial operation from the year of contract acceptance. However, this measure of duration does not account for the potential for Pre-GEA projects to begin the connection assessment process prior to the award of a contract to sell electricity. For the subset of 26 pre-GEA projects with available connection assessment application dates,

Table 3: Months from IESO Generation Contract Date to Commercial Operation by Contract Type as of December 31, 2015

Contract Type	Number	Duration Mean (Months)	Duration Standard Deviation (Months)
Pre-GEA	50	29.1	19.6
with CAA application date	26	42.9	19.5
Post-GEA	43	41.1	14.5
FIT	39	40.9	15.0
FIT 1	39	40.9	15.0
FIT 3	0	.	.
GEIA	4	43.3	9.0
RES	15	26.1	9.7
RES I	4	18.0	2.8
RES II	6	32.3	11.8
RES III	5	25.0	5
RESOP	35	30.5	22.6
<b>Overall</b>	<b>93</b>	<b>34.7</b>	<b>18.4</b>

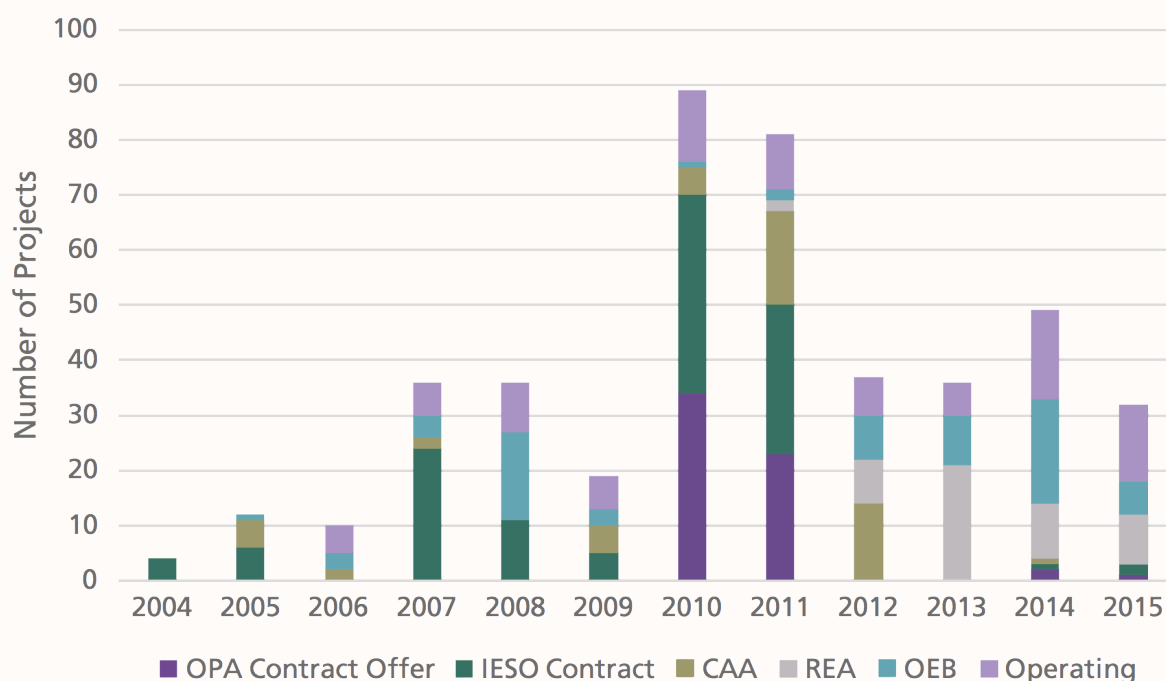
# Policy Brief

## Renewable Energy Policy and Wind Generation in Ontario

the average time in months from this application to commercial operation is 42.9 months with a standard deviation of 19.5 months. Thus, on a more comparable basis, there appears to be little difference in the average duration of the development period of wind projects initiated before and after the GEA. This may indicate that the GEA's streamlining of the regulatory process has been more successful in reducing the variation in the processing time than in reducing the average duration.

Figure 1 illustrates the progression of projects through the regulatory and development process over the period from 2004, when the first renewable energy program began, through 2015.

Figure 1: Project Development Stage by Year



However, caution must be exercised in drawing conclusions from these raw comparisons both due to the small sample size overall and because complete regulatory data has not been obtained for some projects. Simply comparing the number of projects at different stages of development by whether they were pre- or post-GEA is interesting but fails to account for the longer period of time in which a project could have been completed if it was initiated before the GEA and for the on-going development of some projects at the time data collection ended. Further, the differences observed in the approval times of successful projects tells only a small part of the development story in Ontario. In addition to the differences observed in the data for projects achieving commercial operation before and after the GEA, there may be more significant differences in particular stages of the regulatory process, between stages of the regulatory process, and in the outcomes of unsuccessful projects. For example, 84 FIT contracts have been offered to on-shore wind generation projects, yet only 59 currently have active FIT contracts and of these only 39 (46%) have achieved commercial operation. With a 20-year contract to sell electricity at a favored and guaranteed rate and a streamlined regulatory process, what can account for the low rate of achieving commercial operation over a 5-year time horizon?



The first stage of the regulatory process for both pre- and post-GEA projects is the connection assessment. A total of 138 new on-shore wind generation CAA applications were identified, including 88 submitted prior to the enactment of the GEA. Surprisingly, 73 (53%) of these projects were ultimately cancelled with nearly all of the applications having been withdrawn before the completion of the connection assessment process. While the differences in the capacity between completed applications or in-service projects and those withdrawn or cancelled do not appear to be statistically significant, on average the unsuccessful projects have approximately one-third greater generation capacity measured in MW. (See Tables 4 and 5.) Similarly, while not statistically significant, pre-GEA submitted projects tended to have greater capacity, averaging 107 MW versus 80 MW afterwards. The bigger contrast before and after the GEA is in the disposition of applications though. Of the 73 cancelled projects and 65 withdrawn applications, nearly all of them, 93% and 94%, respectively, were initiated before the GEA. The difference in withdrawals and cancellations in the CAA phase may be explained by the difference in the contracting process across these regulatory regimes. Prior to the GEA, beginning the connection assessment process prior to submitting an application with the OPA was encouraged. It is possible that many of the withdrawals occurred when the proponent was unsuccessful in obtaining a contract to sell electricity, resulting in cancellation of the project.

Table 4: Project Capacity by Connection Assessment Application Status as of December 31, 2015

Assessment Status	Number	Project Capacity Mean (MW)	Project Capacity Standard Deviation (MW)
Complete	43	84.0	46.8
On-Hold	2	74.3	35.0
Preliminary Assessment Complete	5	86.5	46.0
Withdrawn	65	113.9	90.1
<b>Overall</b>	<b>115</b>	<b>100.8</b>	<b>75.4</b>

Table 5: Reported Project Capacity on Connection Assessment Application by Project Status as of December 31, 2015

Project Status	Number	Project Capacity Mean (MW)	Project Capacity Standard Deviation (MW)
Cancelled	72	111.2	86.7
In-Service	36	85.5	49.2
Other	8	66.8	37.2
<b>Overall</b>	<b>116</b>	<b>100.2</b>	<b>75.4</b>

**Note:** "Other" includes projects with assessments still in progress, recently completed, and with future expected in-service dates.

The primary difference in the regulatory process before and after the GEA is in the environmental assessment process. After the GEA, wind generation projects were subject to the provisions of the REA. 69 projects have applied for a Renewable Energy Approval, and all but 7 were approved. 66 of the projects were awarded FIT contracts, indicating that 18% of wind generation projects awarded contracts have not advanced to this stage of the regulatory process to date. The average capacity of the 69 projects submitting REAs is approximately 45 MW with a range from 1 kW (Lambton College Wind Turbine) to 270 MW (South Kent Wind Project and

K2 Wind Farm) with a standard deviation of about 63 MW.<sup>14</sup> The average number of turbines per submitted project is 22 with a range of 1 to 140 (K2 Wind Farm) and a standard deviation of 30. While only seven of the 69 submitted applications were refused, withdrawn, or returned as incomplete, overall approved submissions exhibit a larger proposed capacity and number of turbines. The average capacity for approved projects is 49 MW versus 16 MW for refused projects and 9 MW for those withdrawn or returned. Similarly, approved projects average 24 turbines versus 9 for those refused and 4 for withdrawn and returned. While it is difficult to draw robust conclusions with such a small number of unsuccessful projects, these results may suggest an advantage to developers with more significant financial or administrative resources in successfully completing the post-GEA environmental assessment process in spite of reduced regulatory requirements for smaller developments in the legislation. Extremely limited data was found regarding the outcomes of environmental assessments for wind generation projects prior to the GEA, making direct comparisons of the environmental assessment phase anecdotal at best.

The final regulatory phase, obtaining a generation license from the OEB, shows no difference between projects before and after the Green Energy Act based on the duration between application and approval in months. For the subset of 58 projects identified with both application and approval dates, the average duration of the OEB process is 3.6 months both before and after the GEA.

While this analysis comparing development outcomes for proposed wind generation facilities has some limitations as previously noted, the data collected shows no significant differences in project development duration or success rates. To date, 46% of projects subject to the provisions of the GEA and awarded a FIT contract have achieved commercial operation. The reasons for this are unclear, since few FIT contracted projects fail to achieve regulatory approvals and the approval durations after application are not long on average (e.g., approximately 4 months for the OEB and generally less than 6 months for the REA). The percentage of successful projects is much smaller if the full set of projects applying for FIT contracts is considered, which is due primarily to the lack of available transmission capacity for the volume of distributed generation projects proposed.

## CONCLUSION

The 2009 Green Energy and Green Economy Act was intended in large part to promote more and faster development of renewable energy projects than was achieved under the previous Renewable Energy Supply and Renewable Energy Standard Offer Programs. Yet, analysis of a unique database constructed to capture every proposed commercial wind power project in Ontario suggests that the legislative goal of streamlining the regulatory approval process for renewable energy generation projects has not translated into tangible gains in the rate or ease of developing wind generation capacity. Comparisons of the duration of the regulatory process and the number of projects successfully reaching commercial operation fail to show significant differences from the prior regulatory regime. Two factors likely play a role in long development timelines after the the GEA: the lack of sufficient transmission capacity in some areas and a changeable regulatory process.

---

<sup>14</sup> Note the Lambton College project's capacity is below the threshold requiring an REA approval and was the only submission for a proposed project below 3 kW. Two additional projects submitting REA applications were below the 10 kW capacity eligibility for the FIT program.

Due to a lack of data on projects submitting an RFP under the RES or applications under RESOP, it is not possible compare the effect of transmission capacity allocation before and after the GEA. However, after the GEA, the lack of transmission capacity to support widely distributed generation projects meant many wind generation developers were required to wait to be allocated transmission capacity after an application for a FIT contract was accepted. In fact, the majority of projects enumerated on the FIT Capacity Allocation Ranking list did not apply for further regulator approvals and appear to have never been granted an allocation.

In addition, after the enactment of the GEA, the regulatory processes governing wind generation development were under continual revision. Between September 2009 and December 2015 there were approximately 16 changes to the FIT program that led to the issuance of new written FIT rules, contracts, and/or definitions. Although the majority of the changes appear to be minor, this translates into codified changes in the program almost every 4.5 months. Further, after a major review of the FIT program in late 2011 and early 2012, local community support became all but mandatory to be awarded a contract to sell electricity, and required new engagement procedures for developers. The effect of such changes is difficult to measure directly, but the lack of any successful wind generation applications for FIT contracts subsequent to the major change in the program rules suggests that they had a substantive effect.

### REFERENCES

- Canadian Wind Energy Association, "List of Wind Farms in Canada", Web 26 Jan 2015. [http://canwea.ca/wp-content/uploads/2013/12/Installedcap\\_PublicWebsite-Dec-31-2015.pdf](http://canwea.ca/wp-content/uploads/2013/12/Installedcap_PublicWebsite-Dec-31-2015.pdf)
- Christidis, T. and J. Law, "Mapping Ontario's Wind Turbines: Challenges and Limitations", *ISPRS International Journal of Geo-Information*, 2, 2013, 1092-1105.
- , "Review: The use of geographic information systems in wind turbine and wind energy research", *Journal of Renewable and Sustainable Energy*, 4, 2012.
- Holburn, G., Lui, K., and C. Morand, "Policy Risk and Private Investment in Ontario's Wind Power Sector", *Canadian Public Policy*, 36, 4, 465-486, 2010.
- Independent Electricity System Operator, "Connection Assessments and Approvals", Web 3 June 2016. <http://www.ieso.ca/Pages/Participate/Connection-Assessments/default.aspx>
- , "FIT Program", Web 25 Nov 2015. <http://fit.powerauthority.on.ca/fit-program>
- , "A Progress Report on Contracted Electricity Supply: Fourth Quarter 2015", Web 26 Jun 2016. <http://www.ieso.ca/Documents/Supply/Progress-Report-Contracted-Supply-Q42015.pdf>
- , "Prerequisites", Web 3 June 2016. <http://fit.powerauthority.on.ca/contract-management/notice-proceed/prerequisites>
- Mulvihill, P., Winfield, M. and J. Etcheverry, "Strategic Environmental Assessment and Advanced Renewable Energy in Ontario: Moving Forward or Blowing in the Wind?", *Journal of Environmental Assessment Policy and Management*, 15, 2, 2013.
- Ontario Energy Board, "Information for Generators", Web 3 June 2016. <http://www.ontarioenergyboard.ca/oeb/Industry/Rules%20and%20Requirements/Information%20for%20Generators/1%20Want%20to%20Get%20Connected.%20Whats%20Next>
- , "Licenses", Web Web 3 June 2016. <http://www.ontarioenergyboard.ca/oeb/Industry/Licences>
- Ontario Ministry of Energy, "FIT and microFIT Programs", Web 25 Sep 2015. <http://www.energy.gov.on.ca/en/fit-and-microfit-program/>
- Ontario Ministry of Environment and Climate Change, "Renewable Energy Approvals", Web 3 June 2016. <https://www.ontario.ca/page/renewable-energy-approvals>
- , "Renewable Energy Projects Listing", Web 3 June 2016. <https://www.ontario.ca/environment-and-energy/renewable-energy-projects-listing?drpType=Wind&drpStatus=0&drpLocation=0>
- Stokes, L, "Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy." *American Journal of Political Science*, forthcoming.
- , "The politics of renewable energy policies: The case of feed-in tariffs in Ontario, Canada", *Energy Policy*, 56, 2013, 490-500.
- Winfield, M. and B. Dolter, "Energy, economic and environmental discourses and their policy impact: The case of Ontario's Green Energy and Green Economy Act", *Energy Policy*, 68, 2014, 423-435.

## Exhibit 1: Wind Generation Developments in Commercial Operation as of December 31, 2015

Project Name	Date of Operation	Date of REA Decision	Date of CAA Approval	Date of OEB Approval	OPA Contract Offer Date	IESO Active Contract Date	IESO Contract Type	IESO Contract Capacity (MW)
Adelaide Wind Energy Centre (Kerwood)	22-Aug-14	01-Aug-13	21-Dec-11	13-Feb-14	4-Jul-11	30-Sep-11	FIT 1	60
Adelaide Wind Power Project (Strathroy)	29-Jan-15	11-Dec-13	08-Jun-12	21-Aug-14	4-Jul-11	29-Jul-11	FIT 1	40
Armow Wind Project	7-Dec-15	09-Oct-13	07-Mar-12	06-Nov-14	NA	02-Aug-11	GEIA	180
Arthur Wind Farm Project	27-Jan-11	NA		23-Jul-08	NA	02-Mar-07	RESOP	NA
Ashton Ridge Golf Course	19-Mar-12	NA			NA	27-Jan-07	RESOP	NA
Bisnett Wind Farm	17-Dec-09	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Bluewater Wind Energy Centre	19-Jul-14	22-Apr-13	23-Dec-11	06-Mar-14	4-Jul-11	30-Sep-11	FIT 1	60
Bornish Wind Energy Centre	15-Aug-14	26-Apr-13	21-Dec-11	13-Feb-14	4-Jul-11	30-Sep-11	FIT 1	73.5
Bow Lake phase 1	10-Aug-15	16-Dec-13		03-Apr-14	08-Apr-10	14-Jun-10	FIT 1	20
Bow Lake phase 2b	24-Sep-15	16-Dec-13		03-Apr-14	08-Apr-10	28-Jul-10	FIT 1	40
Canadian Auto Workers Clean Wind Energy Project	24-Oct-13	NA	NA	NA	10-Mar-10	14-May-10	FIT 1	0.5
Cedar Point Wind	7-Oct-15	22-Aug-14	04-Jun-12	21-May-15	4-Jul-11	29-Jul-11	FIT 1	100
Clear Creek Wind Farm	14-Nov-08	NA		05-May-08	NA	30-Jan-08	RESOP	NA
Comber East	25-Nov-11	NA	28-Oct-10		8-Apr-10	02-May-10	FIT 1	82.8
Comber West	8-Nov-11	NA	28-Oct-10		8-Apr-10	02-May-10	FIT 1	82.8
Conestogo Wind Energy Centre I	20-Dec-12	08-Dec-11	11-Apr-11	08-Nov-12	8-Apr-10	18-May-10	FIT 1	23
Cruikshank Wind Farm	26-Sep-08	NA	NA	NA	NA	01-Feb-07	RESOP	NA
Cultus Wind Project	12-Jun-08	NA	NA	05-May-08	NA	21-Jun-07	RESOP	NA
Dufferin Wind Farm	1-Dec-14	10-Jun-13	02-Dec-11	19-Sep-13	23-Jun-10	23-Jun-10	FIT 1	91.387
East Durham Wind Energy Centre	17-Aug-15	20-Jan-14	20-Dec-12	11-Jun-14	4-Jul-11	30-Sep-11	FIT 1	23
East Lake St. Clair Wind Farm	22-May-13		04-Jan-12	31-Jan-13	4-Jul-11	05-Aug-11	FIT 1	99
Enbridge Ontario Wind Power Project	19-Feb-09	NA	05-Dec-06		NA	21-Nov-05	RES II	181.5
Erie Shores/Port Burwell/Malahide Wind Farm	24-May-06	NA	20-Apr-05	22-Jun-05	NA	24-Nov-04	RES I	99
Erieau Wind Farm	22-May-13	13-Dec-11	04-Jan-12	31-Jan-13	4-Jul-11	05-Aug-11	FIT 1	99
Ernestown Wind Park	30-Sep-14	12-Aug-13		07-Nov-13	8-Apr-10	12-May-10	FIT 1	10
Exhibition Place Windturbine	27-Apr-07	NA			NA	26-Apr-07	RESOP	NA
Ferndale Wind Farm	8-May-07	NA			NA	24-Jan-07	RESOP	NA
Frogmore Wind Project	12-Jun-08	NA		05-May-08	NA	21-Jun-07	RESOP	NA
Front Line Wind Farm	29-Jan-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Generator	30-Sep-07	NA			NA	11-Sep-07	RESOP	NA
Gesner Wind Farm	23-Jan-13	19-Jan-12		21-Jun-12	NA	20-Jun-08	RESOP	NA
Gosfield Wind Facility	16-Sep-10	NA	09-Dec-09	28-Sep-09	NA	13-Jan-09	RES III	50.6
Goshen Wind Energy Centre	28-Jan-15	24-Jul-14	23-Dec-11	27-Nov-14	4-Jul-11	30-Sep-11	FIT 1	102
Goulais Wind Farm	21-May-15	04-Oct-13	14-Oct-11	11-Dec-14	8-Apr-10	04-Jun-10	FIT 1	25
Gracey Wind Farm	15-Dec-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Grand Renewable Energy Park	9-Dec-14	15-Jun-12	05-May-11	20-Dec-12	NA	02-Aug-11	GEIA	148.6
Grand Valley Wind Farms (Phase 2)	24-Mar-12		22-Jul-11	30-Jan-12	08-Apr-10	02-Jun-10	FIT 1	10.8
Grand Valley Wind Farms (Phase 3)	3-Dec-15	15-Oct-14	03-Feb-12	07-May-15	4-Jul-11	15-Sep-11	FIT 1	40
Greenwich Renewable Energy Project	14-Oct-11	NA	16-Dec-09		NA	14-Jan-09	RES III	98.9
Grey Highlands Zero Emissions People HAF Energy	26-Feb-16	01-Apr-15	22-Feb-12	21-Jan-16	08-Apr-10	02-Jun-10	FIT 1	10
HAF Energy	25-Jun-14	20-Jun-13	NA	19-Sep-13	08-Apr-10	18-May-10	FIT 1	10
Harrow I Wind Farm	12-May-10	NA		23-Jul-08	NA	7-Mar-08	RESOP	NA
Harrow II Wind Farm	12-May-10	NA			NA	7-Mar-08	RESOP	NA
Harrow III Wind Farm	14-May-10	NA			NA	7-Mar-08	RESOP	NA
Harrow IV Wind Farm	21-May-10	NA			NA	4-Feb-08	RESOP	NA
Huron Wind Farm	11-Mar-08	NA			NA	04-Mar-08	RESOP	NA
Jericho Wind Energy Centre	22-Nov-14	14-Apr-14	21-Dec-11	31-Jul-14	4-Jul-11	30-Sep-11	FIT 1	150
Jura Wind	17-Oct-07	NA			NA	02-Oct-07	RESOP	NA
K2 (Kingsbridge II) Wind Project	29-May-15	23-Jul-13	24-Feb-12	20-Mar-14	NA	02-Aug-11	GEIA	270
Kent Breeze Wind Farm	12-May-11	NA		01-May-07	24-Mar-08	24-Mar-08	RESOP	NA

# Policy Brief

## Renewable Energy Policy and Wind Generation in Ontario

(con't) Exhibit 1: Wind Generation Developments in Commercial Operation as of December 31, 2015

Project Name	Date of Operation	Date of REA Decision	Date of CAA Approval	Date of OEB Approval	OPA Contract Offer Date	IESO Active Contract Date	IESO Contract Type	IESO Contract Capacity (MW)
KEPA (Port Alama) Wind Farm	31-Oct-08	NA	20-Apr-07	28-Aug-08	NA	21-Nov-05	RES II	101.2
Kingsbridge I Wind Power Project	16-Mar-06	NA	14-Apr-05	21-Dec-06	NA	24-Nov-04	RES I	39.6
Kruger Energy Chatham Wind Project	1-Jan-11	NA	04-Dec-09	09-Jul-10	NA	14-Jan-09	RES III	99.4
MacLeod Windmill Project Inc.	12-May-11	NA			NA	24-Mar-08	RESOP	NA
Marsh Line Wind Farm	22-Jan-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
McLean's Mountain Wind Farm 1	1-May-14	31-Oct-12			08-Apr-10	21-May-10	FIT 1	60
Melancthon I Wind Plant	4-Mar-06	NA	13-May-05		NA	24-Nov-04	RES I	67.5
Melancthon II EcoPower Centre	24-Nov-08	NA	13-May-05		NA	21-Nov-05	RES II	132
Mohawk Point Wind Farm	24-Oct-08	NA		05-May-08	NA	15-May-07	RESOP	NA
Mother Earth Renewable Energy (MERE) Project	4-Sep-12		NA	05-Mar-12	8-Apr-10	04-Jun-10	FIT 1	4
Napier wind farm	21-Dec-15	03-Dec-13	NA	17-Sep-15	04-Jul-11	29-Jul-11	FIT 1	4.1
Naylor Wind Farm	27-Oct-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
North Malden Wind Farm	27-Jan-11	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Oxley Wind Farm	8-Feb-14	13-Jun-13		07-Nov-13	NA	31-Aug-07	RESOP	NA
Plateau I & II Wind	16-Mar-12		09-Mar-11	20-Sep-12	08-Apr-10	13-May-10	FIT 1	18
Plateau III Wind	26-Jan-12		NA	20-Sep-12	08-Apr-10	13-May-10	FIT 1	9
Pointe Aux Roches Wind	7-Dec-11		28-Oct-10	20-Sep-12	08-Apr-10	13-May-10	FIT 1	48.6
Port Albert Wind Farm	20-Apr-07	NA		21-Dec-06	NA	14-Mar-07	RESOP	NA
Port Dover and Nanticoke Wind	8-Nov-13	17-Jul-12	15-Nov-10	15-Aug-13	08-Apr-10	04-Jun-10	FIT 1	104.4
Prince Park Wind Farm (Prince 1)	21-Sep-06	NA	14-Apr-05	01-Sep-06	NA	24-Nov-04	RES I	99
Prince Park Wind Farm (Prince 2)	19-Nov-06	NA			NA	21-Nov-05	RES II	90
Proof Line Wind Farm	28-Dec-09	NA		05-Jun-14	NA	11-Jun-07	RESOP	NA
Quixote Wind (Q1WEC)	14-Aug-15	24-Jul-14	NA	06-Nov-14	04-Jul-11	10-Aug-11	FIT 1	2.3
Raleigh Wind Energy Centre	29-Jan-11	NA	27-Nov-09	17-Sep-09	NA	12-Jan-09	RES II	78
Ravenswood Wind Power Project	25-Jan-08	NA		26-Jun-07	NA	20-Jun-07	RESOP	NA
Richardson Wind Farm	19-Nov-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Ripley Wind Power Project	22-Dec-07	NA	30-Aug-06	01-May-07	NA	21-Nov-05	RES II	76
Rosa Flora Wind Turbine	30-Mar-09	NA			NA	25-Jun-08	RESOP	NA
Skyway 8 Wind Farm A	14-Aug-14	NA			NA	6-Mar-07	RESOP	NA
South Branch (Dundas) Wind Farm	4-Mar-14	11-Jul-13	14-04-2011	24-Oct-13	08-Apr-10	18-May-10	FIT 1	30
South Kent Wind	28-Mar-14	15-Jun-12	05-05-2011	06-Dec-11	NA	02-Aug-11	GEIA	270
South Side Wind Farm	31-Dec-10	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Springwood Wind Farm	21-Nov-14	18-Oct-12	NA	09-Jan-14		23-Jul-10	FIT 1	8.2
St. Columban 1 Wind Energy Project	16-Jul-15	02-Jul-13	27-07-2012	22-May-14	04-Jul-11	16-Aug-11	FIT 1	18
St. Columban 2 Wind Energy Project	22-Jun-15	02-Jul-13			04-Jul-11	16-Aug-11	FIT 1	15
Summerhaven Wind Energy Centre	6-Aug-13	16-Mar-12	04-11-2010	14-Feb-13	08-Apr-10	30-Apr-10	FIT 1	125
Swanton Line Wind Farm	8-Dec-09	NA		28-Aug-08	NA	21-Feb-07	RESOP	NA
Talbot Wind Farm	16-Dec-10	NA	26-11-2009	05-Oct-09	NA	14-Jan-09	RES III	98.9
Wainfleet Wind Farm	17-Sep-14	07-Oct-13	NA	02-Jan-14	08-Apr-10	14-May-10	FIT 1	10
Whittington Wind Farm	21-Nov-14	15-Feb-13	NA	24-Apr-14	08-Apr-10	21-May-10	FIT 1	6.15
Wolfe Island Wind	26-Jun-09	NA	14-08-2007	12-Oct-07	NA	21-Nov-05	RES II	197.8
Zephyr Wind Farm	15-May-12	NA		20-Jan-11	NA	05-Jun-08	RESOP	NA
Zurich	13-Oct-10		NA			19-Mar-10	FIT 1	0.8

Exhibit 2: Wind Farms with Active Generation Contracts not in Commercial Operation as of December 31, 2015

Project Name	Date of REA Decision	Date of CAA Approval	Date of OEB Approval	OPA Contract Offer Date	IESO Active Contract Date	IESO Contract Type	IESO Capacity (MW)
Amherst Island Wind Project	24-Aug-15	18-Apr-12		24-Feb-11	25-Mar-11	FIT 1	75
Belle River Wind				30-Jul-14	22-Sep-14	GEIA	100
Blind River Marina		NA		30-Jul-14	09-Jan-15	FIT 1	0.05
Clarington Wind Farm	08-Dec-14	20-Dec-12		8-Apr-10	15-Jun-10	FIT 1	8.1
Fairview Wind Farm		24-Jun-11		8-Apr-10	04-Jun-10	FIT 1	18.4
Grand Bend Wind Farm	26-Jun-14	21-Dec-11	06-Nov-14	4-Jul-11	27-Jul-11	FIT 1	100
Grey Highlands Clean Energy				08-Apr-10	04-Jun-10	FIT 1	18.45
Gunn's Hill Wind Farm	09-Apr-15	24-Jun-14		4-Jul-11	26-Aug-11	FIT 1	18
Majestic Wind Farm	13-Jul-15	NA		4-Jul-11	09-Jul-11	FIT 1	2
Meyer Wind Farm	20-May-15	NA		4-Jul-11	29-Jul-11	FIT 1	4
Niagara Region Wind Farm	06-Nov-14	27-Jul-12	04-Jun-15	24-Feb-11	15-Apr-11	FIT 1	230
Nigig Power Corporation				24-Feb-11	22-Jun-11	FIT 1	300
North Kent Wind				01-Apr-15	01-Apr-15	GEIA	100
Ostrander Point Wind Energy Park	20-Dec-12	02-May-11		08-Apr-10	22-Jul-10	FIT 1	22.5
Port Ryerse Wind Farm	20-Aug-14			24-Feb-11	01-May-11	FIT 1	10
Settlers Landing Wind Park				08-Apr-10	26-May-10	FIT 1	10
Skyway 126 Wind Energy	15-Dec-15			08-Apr-10	26-May-10	FIT 1	10
Snowy Ridge Wind Park	19-Jun-15			08-Apr-10	26-May-10	FIT 1	10
Sumac Ridge Wind Farm	11-Dec-13		16-Jul-15	08-Apr-10	23-Jul-10	FIT 1	10.25
Trout Creek	01-Jun-15			08-Apr-10	02-Jun-10	FIT 1	10
White Pines Wind Farm	16-Jul-15	26-10-2011	19-Mar-15	08-Apr-10	15-Jun-10	FIT 1	60
Wolfe Island Shoals Wind Farm				08-Apr-10	21-Sep-10	FIT 1	300
ZEP Wind Farm Garnaraska	30-Jan-15	22-02-2012		08-Apr-10	14-May-10	FIT 1	17.600

## ABOUT THE IVEY ENERGY POLICY AND MANGEMENT CENTRE

The Ivey Energy Policy and Management Centre is the centre of expertise at the Ivey Business School focused on national energy business issues and public policies. It conducts and disseminates first class research on energy policy; and promotes informed debate on public policy in the sector through supporting conferences and workshops that bring together industry, government, academia and other stakeholders in a neutral forum. The Centre draws on leading edge research by Ivey faculty as well as by faculty within Western University.

More information is available at  
[www.ivey.ca/energy](http://www.ivey.ca/energy)



Energy Policy and  
Management Centre

WESTERN UNIVERSITY · CANADA

## AUTHOR

**Margaret Loudermilk**, Adjunct Research Professor and Research Director, Ivey Energy Policy and Management Centre, Ivey Business School

*The findings and opinions contained in this report reflect solely those of the author(s). The Ivey Energy Policy and Management Centre submits reports for external review by academic and policy experts and energy sector stakeholders. The Centre gratefully acknowledges support from organizations and individuals listed on the Centre's website: <https://www.ivey.uwo.ca/energycentre/about-us/supporters>*