

A Progress Report on Contracted Electricity Supply

FOURTH QUARTER, 2014



ieso

Independent Electricity System Operator

Preface

The Ontario Power Authority (OPA) was established by the Ontario government under the *Electricity Restructuring Act, 2004* (amending the *Electricity Act, 1998*), as Ontario's long-term energy planner to ensure a clean, reliable, cost-effective and sustainable supply of electricity for Ontarians.

As of January 1, 2015, the OPA and the Independent Electricity System Operator (IESO) merged into a single organization that combines the mandates of both its predecessors under the name of the IESO. All contractual obligations of the OPA have moved to the new organization.

Together with its partners, the IESO ensures that electricity needs are met for the benefit of Ontario both now and in the future. It procures electricity supply from diverse resources and facilitates the measures needed to achieve ambitious conservation targets. The IESO reliably operates the electricity system in real time and plans for a dependable, sustainable system for the long term.

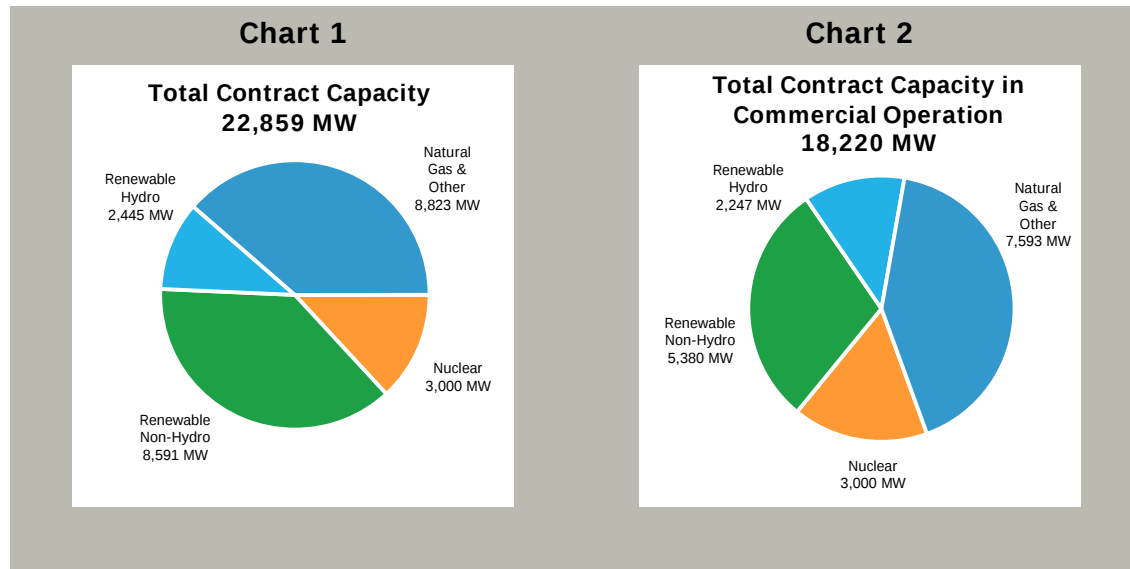
In accordance with the Ontario Energy Board (OEB) Order EB-2005-0489, dated March 3, 2006, the IESO posts regular updates on its website on the progress of procurement initiatives, including the progress of selected projects, subject to confidentiality constraints. *A Progress Report on Contracted Electricity Supply* (<http://www.powerauthority.on.ca/current-electricity-contracts>) is updated quarterly to provide the status of the IESO's contracted electricity supply projects and procurement initiatives. The numbers and information provided in this report include only electricity projects and initiatives in Ontario contracted by the IESO.

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Report Summary

Overview



As of the end of the fourth quarter of 2014, 22,859 megawatts (MW) of electricity supply generation were under contract, of which 18,220 MW or 80 percent were already in commercial operation.

Of the 22,859 MW of supply capacity, 4,675¹ MW were procured from existing generating facilities, which required minimal or no new capital investment. The remaining 18,184 MW were procured from new development, expansion, redevelopment or refurbishment of existing facilities.

Contracted capacity increased by 219 MW since the last reporting period. This was largely due to the addition of 293 MW of renewable energy: 200 MW through three new contracts with the Korean Consortium, 87 MW under the Feed-In Tariff (FIT) Program, and 5 MW under the Hydroelectric Contract Initiative (HCI). These additions were offset in part by a 74-MW reduction of renewable energy under the FIT Program through contract terminations and amendments, and a 6-MW capacity reduction under energy-from-waste contracts.

¹ Includes the existing Smoky Falls Generating Station with a capacity of 53 MW, which will be decommissioned in January 2015.

By the end of the reporting period, the IESO had 8,591 MW of renewable non-hydroelectric, 2,445 MW of renewable hydroelectric, 8,823 MW of natural gas and other fuel sources, and 3,000 MW of nuclear capacity under contract (see Chart 1).

Of the total capacity, 5,380 MW from renewable non-hydroelectric, 2,247 MW from hydroelectric, 7,593 MW from natural gas and other fuel sources, and 3,000 MW from nuclear generation were in commercial operation, for a total of 18,220 MW (see Chart 2). The remaining 4,692 MW of the IESO's contracted capacity were in various stages of development. Chart 3 below illustrates the contracted generation capacity by fuel type.

Chart 3

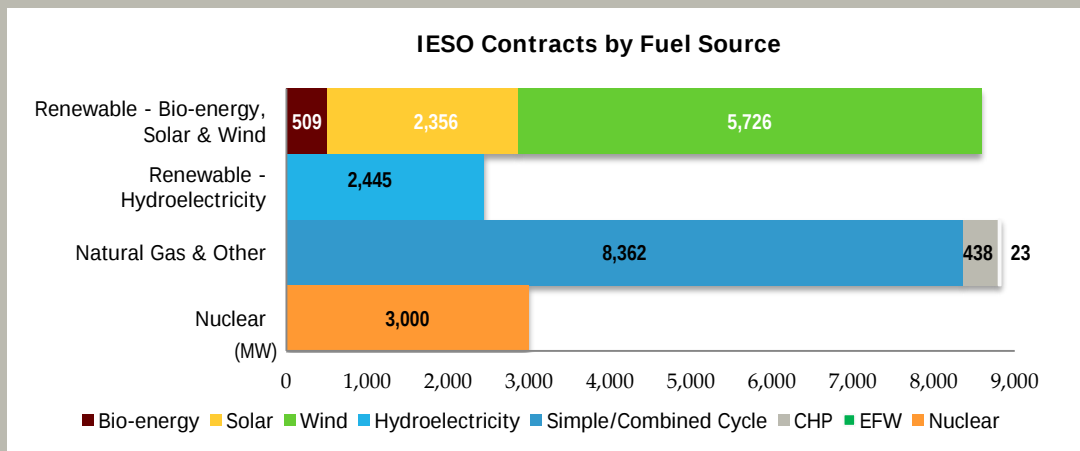


Table 1: Breakdown of Total Contracted Capacity as of December 31, 2014

	Total (MW)	Under Development (MW)	Commercial Operation (MW)
Renewable			
Bio-energy	509	176	333
Solar	2,356	807	1,549
Wind	5,726	2,228	3,498
Non-Hydroelectric – Subtotal	8,591	3,211	5,380
Hydroelectric	2,445	251	2,247 ²
Renewable – Subtotal	11,036	3,462	7,627
Natural Gas and Other Fuel Sources			
Combined Heat and Power (CHP)	438	18	420
Simple Cycle and Combined Cycle (SC/CC)	8,362	1,189	7,173
Energy-from-Waste (EFW)	23	23	0
Natural Gas and Other – Subtotal	8,823	1,230	7,593
Nuclear			
Bruce A	3,000	0	3,000
Nuclear – Subtotal	3,000	0	3,000
Total Contract Capacity (MW)³	22,859	4,692	18,220

New Contracts

Natural Gas

Within the reporting period, 3.5 MW of combined capacity was contracted through the Combined Heat and Power Standard Program (CHPSOP), a stream of the Clean Energy Standard Offer Program (CESOP). CHPSOP contracts were executed with Regent Park Energy Inc. (Regent Park cogeneration facility for 2.73 MW) and the Toronto Community Housing Corporation (Moss Park CHP facility for 0.78 MW). The two new facilities will be constructed in the City of Toronto.

Renewable Energy – Hydroelectricity

Within the reporting period 0.1 MW of combined capacity was contracted through the FIT 3 Program.

² The existing Smoky Falls capacity of 53 MW to be decommissioned in January 2015 is included in the current in-service capacity but is excluded from the total capacity.

³ Totals may differ due to rounding.

Contracted capacity also increased under the Hydroelectric Contract Initiative (HCI). West Nipissing Power Generation added 1.84 MW under an HCI contract to expand its existing generating station in Sturgeon Falls. H2O Power Limited Partnership also increased its contracted capacity by 4 MW under a new HCI contract to expand the Norman Falls Generating Station in the District of Kenora.

Renewable Energy – Non-Hydroelectricity

Bio-energy

Within the reporting period 2.0 MW of combined capacity was contracted through the FIT 3 Program.

Solar

Within the reporting period, 3.35⁴ MW of combined capacity was contracted through the micro Feed-in Tariff (microFIT) Program and 84.6 MW of combined capacity was contracted through the FIT 3 Program. An additional 100 MW of combined capacity was contracted under the Korean Consortium Agreement. Of this amount, 50 MW will come from the Southgate Solar Project, which will be constructed in Holstein in Grey County. The remaining 50 MW will come from the Windsor Solar Project to be constructed in Windsor.

Wind

Within the reporting period 0.1 MW of combined capacity was contracted through the FIT 3 Program. An additional 100 MW of capacity was contracted under the Korean Consortium Agreement. This capacity will be generated by SP Belle River Wind Farm. The facility will be constructed in South Woodslee in Essex County.

Contracts That Reached Commercial Operation

Renewable Energy – Hydroelectricity

Within the reporting period, 256.6 MW of capacity came into commercial operation under the Hydroelectric Energy Supply Agreement (HESA). Construction of the Smoky Falls Generating Station Units 2 and 3 (89.3 MW each) and the Kipling Generating Station (78 MW), all of which are covered under the contract with Ontario Power Generation for Lower Mattagami, were completed and commissioned during October and December 2014. These facilities are located in the District of Cochrane.

Renewable Energy – Non-Hydroelectricity

Solar

Within the reporting period, further to the 3.35 MW of combined capacity from the microFIT Program, 150.26 MW of combined capacity came into commercial operation under the FIT Program.

⁴ The capacity of the executed microFIT contracts is in-service capacity.
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Wind

Within the reporting period, 148.6 MW of capacity came into commercial operation when the Grand Renewable Wind Energy Park, developed by the Korean Consortium, was commissioned on December 9, 2014. This facility is located in Municipality of Haldimand. An additional 283.45 MW of capacity also came into commercial operation under the FIT Program.

Contract Amendments

Renewable Energy – Hydroelectricity

Within the reporting period, capacity was decreased by 0.5 MW through contract amendments to one contract under HCI.

Renewable Energy – Non-Hydroelectricity

Energy-from Waste

Within the reporting period, capacity was decreased by 6.1 MW through a contract amendment for energy supplied by the Durham-York Energy-from-Waste Facility.

Solar

Within the reporting period, capacity was decreased by 0.32 MW through contract amendments to 47 contracts under the FIT Program.

Wind

Within the reporting period, capacity was decreased by 0.9 MW through contract amendments to two contracts under the FIT Program.

Contract Terminations

Renewable Energy – Non-Hydroelectricity

Bio-energy

Within the reporting period, contracted capacity decreased by 0.75 MW as 3 FIT contracts were terminated by mutual agreement.

Solar

Within the reporting period, capacity decreased by 2.1 MW as 21 FIT contracts were terminated by mutual agreement.

Wind

Within the reporting period, capacity decreased by 69.6 MW as 3 FIT contracts were terminated by mutual agreement.

Contract Capacity – Progress Table

The following table shows the IESO-contracted capacity that has achieved commercial operation since 2005 and the capacity that is expected to reach commercial operation up to 2022.

Table 2: Contract Capacity (MW) – Commercial Operation Progress Table as of December 31, 2014

Energy Supply	2005-2012	2013	2014	2015	2016	2017	2018	2019	2020-2021	2022	Total
Renewable	4,436	938	3,643	1,087	388	82	413	13	0	35	11,036
Natural Gas and Other Fuel Sources	7,654	(63) ⁵	7	0	14	293	909	10	0	0	8,823
Nuclear	3,000	0	0	0	0	0	0	0	0	0	3,000
Total	15,090	875	3,650	1,087	401	375	1,323	24	0	35	22,859
Cumulative Total⁶	15,090	15,964	19,614	20,701	21,102	21,477	22,800	22,824	22,824	22,859	

⁵ The new contract capacity of the Lennox Generating Station for its 10-year contract is 2,000 MW, a reduction of 140 MW from the original contract. Within the same period, the OPA also entered into an energy-from-waste pilot contract with Plasco Trail Road Inc. for the 2.8-MW Plasco Trail Road Energy-from-Waste facility. A new NUG contract was signed for 73.7 MW. The net change in capacity was therefore -63 MW.

⁶ Totals may not add up due to rounding.

Aboriginal and Community Participation under the FIT Program⁷

Aboriginal Participation

By the end of the reporting period, First Nations and Métis communities were participating in 418 FIT projects located throughout Ontario. This included 123 MW of solar, 599 MW of wind and 80 MW of hydroelectric generation projects.

Community Participation

By the end of the reporting period, Ontario communities were participating in 358 renewable generation projects located throughout the province. This included 15 MW of bio-energy, 81 MW of solar, 86 MW of wind and 5 MW of hydroelectric generation projects.

Chart 4

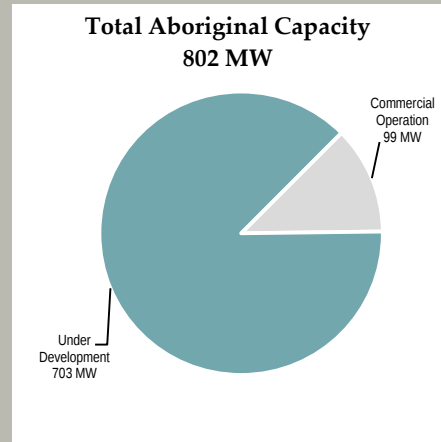
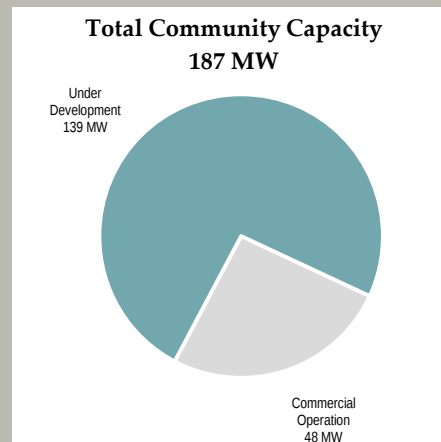


Chart 5



⁷ This section includes only FIT contracts for which the supplier has indicated Aboriginal or community participation under the rules of the FIT Program. Non-FIT contracts that have Aboriginal or community revenue and profit-sharing arrangements or co-ownership are not included.

Additional Details and Related Links

For further information on the IESO's electricity supply projects, visit:

<http://www.powerauthority.on.ca/current-electricity-contracts>.

For further information on the IESO's multiple FIT programs, visit:

<http://fit.powerauthority.on.ca>.

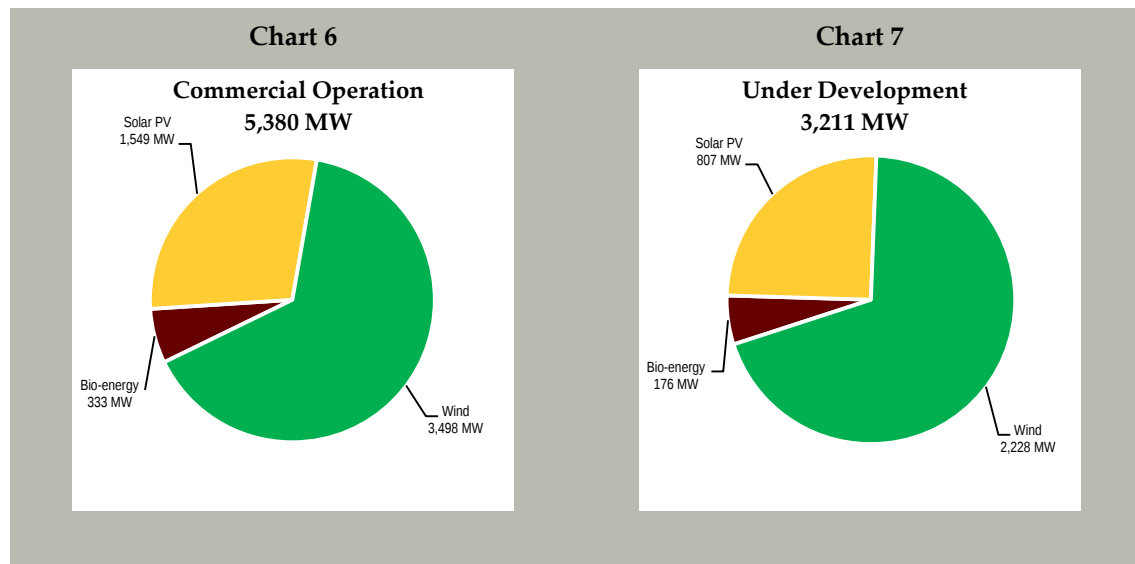
For further information on programs offered to First Nations and Métis communities, visit:

<http://www.aboriginalenergy.ca>.

Renewable Energy

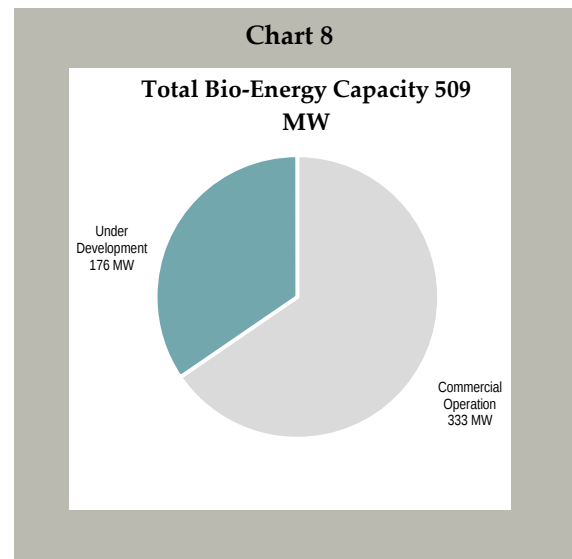
Non-Hydroelectric Projects

By the end of the reporting period, combined capacity from renewable non-hydroelectric energy project was 8,591 MW, of which 5,380 MW were in commercial operation and 3,211 MW were under development. The breakdown is shown in Charts 6 and 7 below.



Bio-Energy

By the end of the reporting period, combined capacity from bio-energy projects was 509 MW. Of the total capacity, 333 MW were in commercial operation and 176 MW were under development. All of the capacity from projects that were under development is scheduled to be in service at or before the end of 2017.



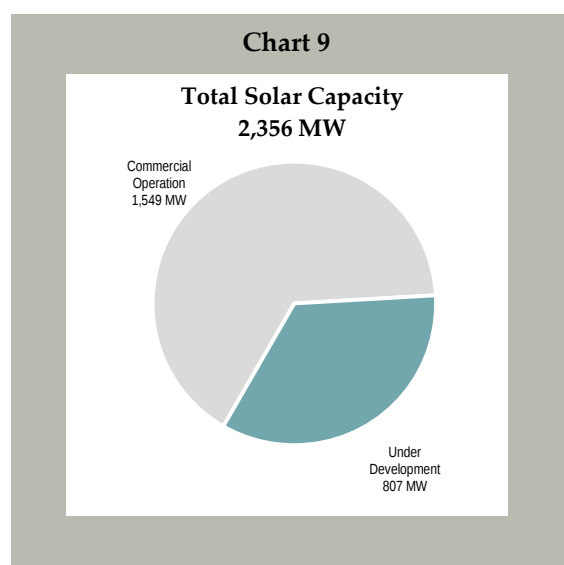
The status of the non-FIT bio-energy projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 3 below.

Table 3: Progress Status of non-FIT Bio-Energy Projects as of December 31, 2014

Developer	Project
Ontario Power Generation	Thunder Bay Generating Station Biomass Conversion, Thunder Bay Capacity: 135 MW Status: Direct construction activities required for commissioning were completed

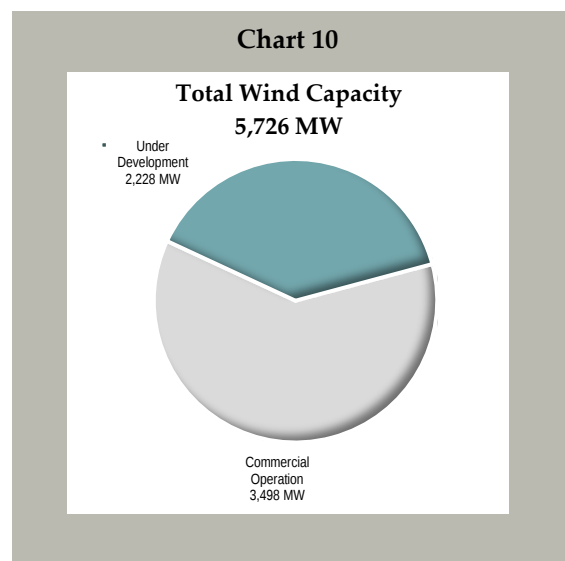
Solar

By the end of the reporting period, combined capacity from solar project was 2,356 MW. All of the capacity from projects that were under development is scheduled to be in service at or before the end of 2017.



Wind

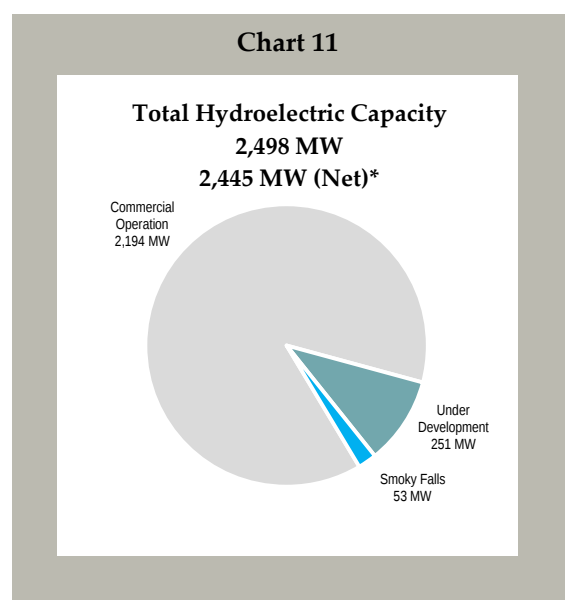
By the end of the reporting period, combined capacity from wind project was 5,726 MW. Of the total capacity, 2,228 MW were under development. All of the capacity from projects that were under development is scheduled to be in service at or before the end of 2018.



Hydroelectric Projects

Hydroelectricity

By the end of the reporting period, combined capacity from hydroelectric projects was 2,445 MW (see Table 1 for further clarification). Of the total capacity, 251 MW were under development. All of the capacity from projects that were under development is scheduled to be in service at or before the end of 2022.



*The net hydroelectric capacity is 2,445 MW, with 53 MW (Smoky Falls) scheduled for decommissioning.

The status of the non-FIT hydroelectric projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 4 below.

Table 4: Progress Status of non-FIT Hydroelectric Projects as of December 31, 2014

Developer	Project
Chaudiere Hydro L.P.	Chaudiere Hydro Generating Station, Ottawa: Ottawa River Capacity: 29.35 MW Permitting and regulatory approvals activities commenced
H2O Power Limited	Twin Falls Expansion, Iroquois Falls: Abitibi River Capacity: 5 MW Status: - The reassembly of the final unit (Unit 2) was completed and commissioned - The process to commission the entire facility continued
Ontario Power Generation and Moose Cree First Nation Partnership	Lower Mattagami Hydroelectric Station Expansion, Kapuskasing: Mattagami River Capacity: 257 MW Status: - Kipling GS - Construction of the facility was completed. All units were commissioned and brought into service during the quarter - Smoky Falls - Construction of the facility was completed. All units were commissioned and brought into service during the quarter
Peterborough Utilities Inc.	London Street Generating Station Expansion Capacity: 5.9 MW Excavation of the new powerhouse, intake canal and tail race continued
Renfrew Power Generating Inc.	Thomas Low Generating Station, Renfrew: Bonnechere River Capacity: 1.5 MW Status: - Construction of the powerhouse and substation was completed and the generators were installed - Protection and controls systems were installed and integrated with existing generators

	First Chute Generating Station, Renfrew: Bonnechere River Capacity: 1.7 MW Project planning and connection impact assessments activities continued
St. Catharines Hydro Generation Inc.	Shickluna Hydro Electric Generating Station, St. Catharines: Twelve Mile Creek Capacity: 4.2 MW Permitting, connection impact assessments and regulatory approvals activities commenced
West Nipissing Power Generation	West Nipissing Power Generating Station, Sturgeon Falls: Sturgeon River Capacity: 1.8 MW A new contract was executed with the supplier to expand the existing facility
Yellow Falls Power Limited Partnership	Yellow Falls Generating Station, Smooth Rock Falls: Mattagami River Capacity: 16 MW Status: Permitting and approvals activities commenced

Renewable Program Projects – Development Status

Renewable Energy Standard Offer Program

A total of 830 MW were contracted through RESOP; 827 MW or 99.5 percent of the contracted capacity was in service by the end of the reporting period, and the remaining 4 MW have milestone commercial operation dates prior to the end of 2015.

Feed-in Tariff Program

By the end of the reporting period, 4,620 MW of combined capacity was contracted through the FIT Program, of which 63 MW were from bio-energy, 1,409 MW were from solar, 2,963 MW were from wind and 186 MW were from hydroelectricity. Of this total capacity, 2,235 MW or 48 percent of the contracted FIT capacity was in commercial operation. In addition, 174 MW of combined contract capacity from solar generation was in commercial operation under the microFIT Program.

Furthermore, 982 MW or 21 percent of the contracted FIT capacity reached the notice to proceed (NTP) stage of development. Of these, 29 MW were from bio-energy, 379 MW were from solar, 529 MW were from wind and 46 MW were from hydroelectric generation. The remaining 1,403 MW, or 30 percent of the contracted capacity, was in the pre-NTP

stage of development, of which 8 MW were from bio-energy, 128 MW were from solar, 1,149 MW were from wind and 118 MW were from hydroelectric generation.

Feed-in Tariff Projects – Progress Table

The status of selected large FIT projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 5 below.

Legend

C	Complete or not required	CIA	Connection Impact Assessment
CO N	Construction	DC P	Domestic Content Plan
FIN	Financing Plan	NTP	Notice to Proceed
Reg EA	Regulatory Environmental Approvals	SIA	System Impact Assessment
U	Under Way		

Table 5: Progress Status of Selected Feed-in Tariff Projects (including the Korean Consortium Projects) Under Development as of December 31, 2014

Developer (Total capacity under development)	Project Name	Location	MW	Pre-NTP								Achieved NTP	CON	
				Reg EA		SIA/CI A		DCP		FIN			U	C
				U	C	U	C	U	C	U	C			
Algonquin Power	Amherst Island Wind Project	Stella	75	✓			✓		✓	✓				
Capstone Infrastructure Corporation (93 MW)	Goulais Wind Farm	Sault Ste. Marie	25		✓		✓		✓		✓	✓		
	Grey Highlands Zero Emission People	Singhampton	10	✓			✓		✓	✓				
	Grey Highlands Clean Energy	Singhampton	18	✓			✓		✓	✓				
	Settlers Landing Wind Park	Pontypool	10	✓			✓		✓	✓				
	Snowy Ridge Wind Park	Bethany	10	✓			✓		✓	✓				
	Wind Farm Ganaraska	Orono	20	✓			✓		✓	✓				
China Longyuan Power Group Corporation Limited	Dufferin Wind Farm ⁸	Shelburne	100		✓		✓		✓		✓	✓		✓
DP Energy (60 MW)	Bow Lake Phase 1 (wind)	Montreal River Harbour	20		✓		✓		✓		✓	✓	✓	

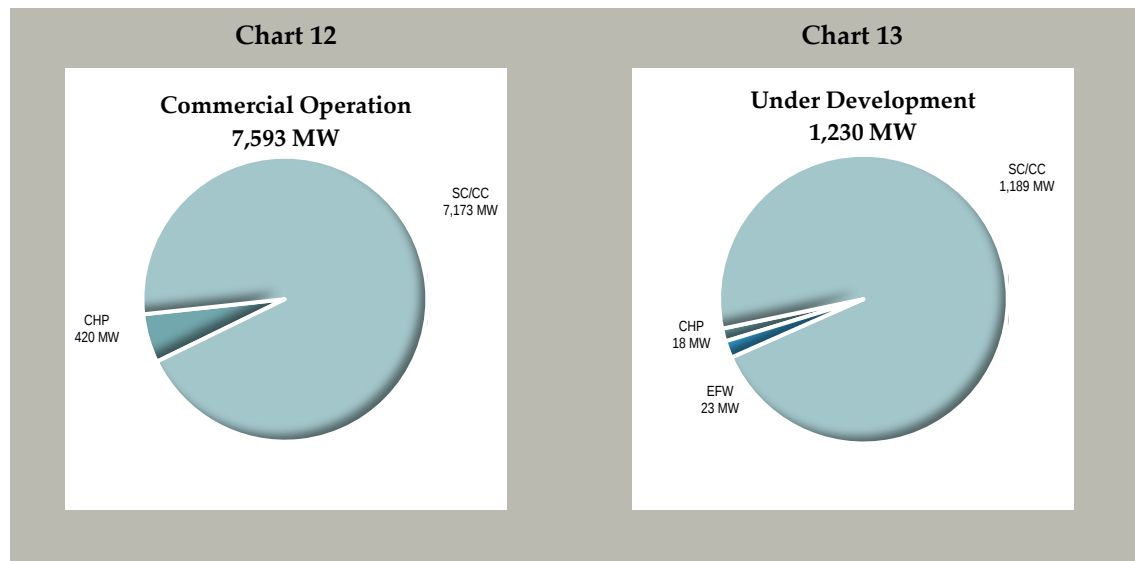
⁸ Achieved commercial operation in December 2014

Developer (Total capacity under development)	Project Name	Location	MW	Pre-NTP								Achieved NTP	CON	
				Reg EA		SIA/CI A		DCP		FIN			U	C
				U	C	U	C	U	C	U	C			
	Bow Lake Phase 2b (wind)	Montreal River Harbour	40		✓		✓		✓		✓		✓	
Henvey Inlet First Nation	Nigig Power Corporation (wind)	Pickerel	300	✓		✓			✓	✓				
Korean Consortium: Samsung C&T Corporation and Korea Electric Power (1,269 MW)	Armow (wind)	Kincardine	180		✓		✓		✓		✓	✓	✓	
	SP Belle River (wind)	South Woodslee	100	✓		✓								
	Grand Renewable Energy Park (wind)	Haldimand County	149		✓		✓		✓		✓	✓		✓
	K2 (wind)	Ashfield- Colborne- Wawanosh	270		✓		✓		✓		✓	✓	✓	
	Grand Renewable Energy Park (solar)	Haldimand County	100		✓		✓		✓		✓	✓	✓	
	Sol-Luce Kingston Solar Energy Project	Kingston and Loyalist Township	100		✓		✓		✓		✓	✓	✓	
	Southgate (solar)	Holstein	50	✓		✓								
	Windsor (solar)	Windsor	50	✓		✓								
NextEra Energy (275 MW)	East Durham Wind Energy Centre	Priceville	23		✓		✓		✓		✓	✓		
	Goshen Wind Energy Centre	Dashwood	102		✓		✓		✓		✓	✓	✓	
	Jericho Wind Energy Centre ⁹	Thedford	150		✓		✓		✓		✓	✓		✓
Niagara Region Wind Corporation	Niagara Region Wind Farm	Smithville	230	✓			✓		✓	✓				
Northland Power	Grand Bend Wind Farm	Zurich	100		✓		✓		✓		✓	✓		
Pic Mobert First Nation and White River	Gitchi Animki Bezhig Generating Station	Brothers Township	9		✓		✓		✓		✓	✓	✓	

⁹ Achieved commercial operation in November 2014

Developer (Total capacity under development)	Project Name	Location	MW	Pre-NTP								Achieved NTP	CON	
				Reg EA		SIA/CI A		DCP		FIN			U	C
				U	C	U	C	U	C	U	C			
Hydro Limited Partnership (a wholly owned subsidiary of	Gitchi Animki Niizh Generating Station	Brothers Township	10		✓		✓		✓		✓	✓	✓	
Suncor Energy Products Inc. (140 MW)	Adelaide Wind Power Project	Strathroy	40		✓		✓		✓		✓	✓	✓	
	Cedar Point Wind Power Project Phase II	Forest	100		✓		✓		✓		✓			
Veresen Inc. (73 MW)	Grand Valley Wind Farms Phase 3	Grand Valley	40		✓		✓		✓		✓			
	St. Columban 1 Wind Energy Project	Seaforth	18		✓		✓		✓		✓	✓	✓	
	St. Columban 2 Wind Energy Project	Seaforth	15		✓		✓		✓		✓	✓	✓	
wpd Canada Corp. (90 MW)	Fairview Wind Farm	Stayner	18	✓			✓	✓						
	Sumac Ridge Wind Farm	Pontypool	12		✓		✓	✓						
	White Pines Wind Farm	Milford	60	✓		✓		✓						

Natural Gas and Other Fuel Sources

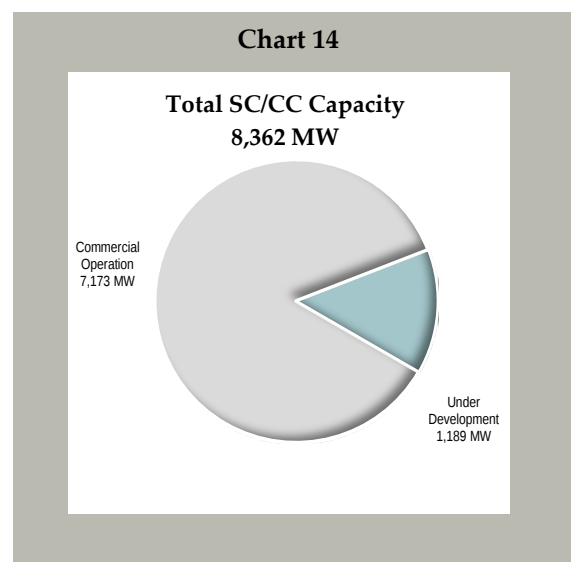


By the end of the reporting period, combined capacity from natural gas-fired projects and projects with other fuel sources was 8,823 MW. This capacity included 8,362 MW from simple-cycle and combined-cycle facilities, 438 MW from combined heat and power contracted facilities and 23 MW from energy-from-waste facilities. Of this capacity, 7,593 MW were under commercial operation and 1,230 MW were under development.

Simple Cycle and Combined Cycle Projects

Simple Cycle and Combined Cycle

By the end of the reporting period, combined capacity from simple-cycle and combined-cycle projects was 8,362 MW. Of this capacity, 7,173 MW were already in operation and 1,189 MW were under development.



The status of the combined-cycle projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 6 below.

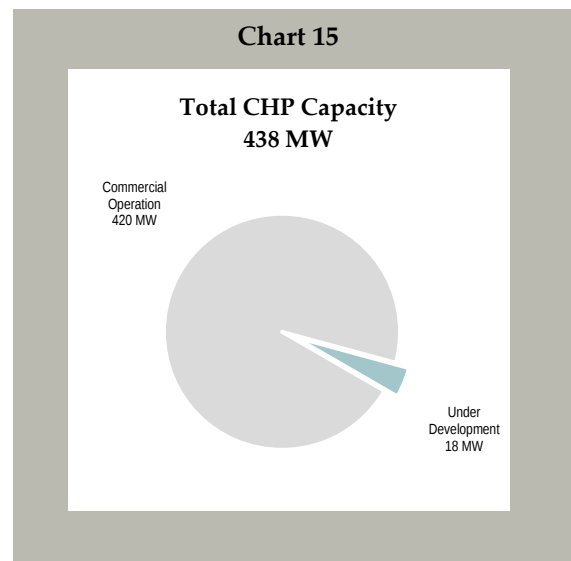
Table 6: Progress Status of Combined Cycle Projects as of December 31, 2014

Developer	Project
Greenfield South Power Corporation	Green Electron Power Plant, Sarnia
	Capacity: 289 MW Status: - Construction of switchyard structures continued - Installation of the combustion turbine, steam turbine and heat recovery steam system continued
TransCanada Energy Ltd.	Napanee Generating Station, Napanee
	Capacity: 900 MW Status: - Environmental approvals were completed - Stakeholder activities continued with First Nations and Métis communities - Connection impact assessment was completed

Combined Heat and Power Projects

Combined Heat and Power

By the end of the reporting period, combined capacity from combined heat and power contracted projects was 438 MW. The 18 MW of capacity from the projects under development is scheduled to be in service by 2019.



The status of the combined heat and power projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 7 below.

Table 7: Progress Status of Combined Heat and Power Projects as of December 31, 2014

Developer	Project
Envida Community Energy Inc.	Hanlon Creek District Energy Project, Guelph Capacity: 10.2 MW Status: • Project planning activities continued
	Rosa Flora Growers, Dunnville Capacity: 4 MW Status: • Reconstruction of the generator building, destroyed by fire, continued • Installation of the generators continued • Connection activities commenced
Rosa Flora Growers Limited	

Energy-from-Waste Projects

By the end of the reporting period, combined capacity of energy-from-waste projects was 23 MW. All of this capacity was under development. The 23 MW of capacity from these projects is scheduled to be in service by late 2018.

The status of the energy-from-waste projects under development in the reporting period, as submitted by developers to the IESO, is shown in Table 8 below.

Table 8: Progress Status of Energy-from-Waste Projects as of December 31, 2014

Developer	Project
Elementa Algoma LP	Elementa Algoma Generating Station, Sault Ste Marie Capacity: 9.45 MW
	Status: • Post-contract and pre-construction activities continued
Regional Municipality of Durham-York	Durham York Energy Centre, Clarington Capacity: 13.9 MW
	Status: • All civil construction and electrical connections were completed • Commissioning activities on the facility continued

Nuclear

Bruce A Restart and Refurbishment Projects

The IESO had 3,000 MW of nuclear energy supply capacity under contract; 1,500 MW were from the restart of units 1 and 2, which was completed at the end of October 2012. The other 1,500 MW were from units 3 and 4, which were in operation prior to contract execution and which continued operations during the reporting period.

For additional information on the Bruce A Restart Project, visit:

- <http://powerauthority.on.ca/nuclear/bruce-restart-and-refurbishment-project-3000-mw-tiverton>
- <http://www.brucepower.com>.

Photo Gallery

Dufferin Wind Farm



Photo 1 – View of the completed facility substation



Photo 2 – Wind turbines in commercial operation

Durham York Energy Centre



Photo 3 – Internal view of lime silos and bag houses



Photo 4 – View of convection pass fly ash hoppers

Gitchi Animki Niizh/Gitchi Animki Bezhig Generating Stations



Photo 5 – Installing reinforcing bars in the soffit



Photo 6 – Scaffolding installation

Grand Renewable Solar Energy Park (Korean Consortium)



Photo 7 – Solar panel array



Photo 8 – Switch yard connected to the solar farm

Grand Renewable Wind Energy Park (Korean Consortium)



Photo 9 – Installing turbine blades on a wind stack



Photo 10 – Construction work at the switchyard

Green Electron Power Plant



Photo 11 – View of the base of the heat-recovery system



Photo 12 – Internal view of the facility: pipelines and flange

K2 Wind Farm (Korean Consortium)



Photo 13 – Offloading the blade of tower stack T308



Photo 14 – Heating and hoarding for grout at T308

London Street Generating Station



Photo 15 – Excavating the site for the powerhouse



Photo 16 – Caisson installation

Lower Mattagami Hydroelectric Station Expansion

Smoky Falls Generating Station



Photo 17 – View of the commissioned station now in service

Thomas Low Generating Station



Photo 18 – Installing the generators



Photo 19 – View of the new powerhouse

Twin Falls Generating Station (Runner Upgrade)



Photo 20 – View of Units 1-5 completed and installed

Thunder Bay Generating Station (Biomass Conversion)



Photo 21 – Conveyor belt replacement



Photo 22 – Metal detector installed

Appendices

Appendix I: IESO Contracts and Contract Capacity

Table 9: All Contract Capacity as of December 31, 2014

Energy Source	Contract Type	Number of Contracts			New Capacity (MW) Post-2003		Total Capacity (MW) Pre- and Post-2003		In Service and Under Development (MW)
		Total	In Service	Under Development	In Service	Under Development	In Service	Under Development	
Bio-energy	Atikokan	1	1	0	205	0	205	0	205
	CHP III	2	2	0	48	0	48	0	48
	FIT 1	45	33	12	26.2	30.6	26.2	30.6	57
	FIT 2	12	0	12	0	4.2	0	4.2	4
	FIT 3	7	0	7	0	2	0	2	2
	NUG	1	1	0	0	0	5	0	5
	RES	3	3	0	9.3	0	9.3	0	9
	RESOP	19	18	1	39.7	4	39.7	4	44
	TBESA	1	0	1	0	135	0	135	135
Subtotal		91	58	33	328.2	175.8	333.2	175.8	509
Solar	FIT 1	1,455	1,252	203	888.9	272.3	888.9	272.3	1,161
	FIT 2	990	87	903	13	150.1	13	150.1	163
	FIT 3	317	0	317	0	84.6	0	84.6	85
	KC	4	0	4	0	300	0	300	300
	microFIT	20,027	20,027	0	173.8	0	173.8	0	173.8
	RESOP	57	57	0	473.7	0	473.7	0	474
	Subtotal	22,850	21,423	1,427	1,549.4	807	1,549.4	807	2,356
Wind	FIT 1	62	26	36	1,284.7	1,678.1	1,284.7	1,678.1	2,963
	FIT 3	1	0	1	0	0.1	0	0.1	0.1
	KC	5	2	3	418.6	550	418.6	550	969
	microFIT	5	5	0	0.03	0	0.03	0	0.03
	RESOP	35	35	0	284.9	0	284.9	0	285
	RES	15	15	0	1,509.4	0	1,509.4	0	1,509
	Subtotal	123	83	40	3,497.6	2,228.2	3,497.6	2,228.2	5,726
Renewable Non-Hydro Subtotal		23,064	21,564	1,500	5,375	3,211	5,380	3,211	8,591
Hydroelectricity	FIT 1	44	4	40	22	163.4	22	163.4	185
	FIT 2	1	0	1	0	0.1	0	0.1	0.1
	FIT 3	1	0	1	0	0.1	0	0.1	0.1
	HCI	55	55	3	16.5	18.2	1,094.5	18.2	1,113
	HESA	4	4	1	561.3	17.6	1,071.4	17.6	1,036
	HESOP	3	0	3	0	35.3	0	35.3	35
	RESOP	16	16	0	28.2	0	28.2	0	28
	RES	3	2	1	31	16	31	16	47
Renewable Hydro Subtotal		127	81	50	659	251	2,247	251	2,445¹⁰

¹⁰ The existing Smoky Falls Generating Station with a capacity of 53 MW will be decommissioned in January 2015.
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Energy Source	Contract Type	Number of Contracts			New Capacity (MW) Post-IESO Inception		Total Capacity (MW) Pre- and Post-IESO Inception		In Service and Under Development (MW)
		Total	In Service	Under Development	In Service	Under Development	In Service	Under Development	
Natural Gas, Other Fuel and Nuclear									
Natural Gas (SC/CC)	ACES	3	3	0	2,030.6	0	2,030.6	0	2,031
	CES	5	3	2	1,672	1,189	1,672	1,189	2,861
	EMCES	5	5	0	985.3	0	1,003.6	0	1,004
	Lennox	1	1	0	0	0	2,000	0	2,000
	NUG	1	1	0	73.7	0	73.7	0	74
	PGS	1	1	0	393	0	393	0	393
	Subtotal	16	14	2	5,080.9	1,189	7,172.9	1,189	8,362
Natural Gas (CHP)	CHP I & CHPSOP	14	10	4	420.1	17.7	420.1	17.7	438
Other	EFW	2	0	2	0	23.4	0	23.4	23
Natural Gas and Other Subtotal		32	24	8	5,501	1,230	7,593	1,230	8,823
Nuclear	Bruce	1	1	0	3,000	0	3,000	0	3,000
Nuclear Subtotal		1	1	0	3,000	0	3,000	0	3,000
Subtotal		21,670		1,558	14,535	4,692	18,220	4,692	22,859
Total		23,224			19,227		22,859 ¹¹		

Acronyms

ACES = Accelerated Clean Energy Supply

CES = Clean Energy Supply

CHPSOP = Combined Heat and Power Standard Offer Program

EFW = Energy-from-Waste

EMCES = Early Movers Clean Energy Supply

HCI = Hydroelectric Contract Initiative

HESA = Hydroelectric Energy Supply Agreement

HESOP = Hydroelectric Standard Offer Program

KC = Korean Consortium

NUG = Non-utility Generator

PGS = Peaking Generation Supply

RES = Renewable Energy Supply

¹¹ The existing Smoky Falls Generating Station with a capacity of 53 MW will be decommissioned in January 2015.
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TBESA= Thunder Bay Biomass Energy Supply Agreement

Appendix II: Contracted Facilities in Commercial Operation¹²

Table 10: Renewable Energy – Bio-energy as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Commercial Operation /Term Commencement Date	Contract Expiry Date
Atikokan Generating Station	205	24-Jul-14	Q3 2024
Becker Cogeneration Plant	8	15-Feb-14	Q1 2024
Eastview Landfill Gas Energy Plant	1.7	18-Aug-05	Q3 2025
Hamilton (Digester Gas) Cogeneration Project	1.6	10-Jul-06	Q3 2026
Trail Road Landfill Generating Facility	6	31-Jan-07	Q1 2027
Thunder Bay Condensing Turbine Project	40	20-Mar-13	Q1 2023
Subtotal	262		

¹² Does not include FIT Program and RESOP.

Table 11: Renewable Energy – Wind as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Commercial Operation / Term Commencement Date	Contract Expiry Date
Enbridge Ontario Wind Farm	181.5	19-Feb-09	Q1 2029
Erie Shores Wind Farm	99	24-May-06	Q2 2026
Gosfield Wind Project	50.6	16-Sep-10	Q4 2032
Grand Renewable Energy Park	148.6	9-Dec-14	Q4 2034
Greenwich Wind Farm	98.9	14-Oct-11	Q4 2031
Kingsbridge I Wind Power Project	39.6	16-Mar-06	Q1 2026
Kruger Energy Chatham Wind Project	99.4	01-Jan-11	Q4 2031
Kruger Energy Port Alma Wind Power Project	101.2	31-Oct-08	Q4 2028
Melancthon I Wind Plant	67.5	04-Mar-06	Q1 2026
Melancthon II Wind Plant	132	24-Nov-08	Q4 2028
Prince I Wind Power Project	99	21-Sep-06	Q3 2026
Prince II Wind Power Project	90	19-Nov-06	Q4 2026
Raleigh Wind Energy Centre	78	29-Jan-11	Q1 2031
Ripley Wind Power Project	76	22-Dec-07	Q4 2027
South Kent Wind (Korean Consortium)	270	28-Mar-14	Q1 2034
Talbot Wind Farm	98.9	16-Dec-10	Q4 2031
Wolfe Island Wind Project	197.8	26-Jun-09	Q2 2029
Subtotal	1,928		

Table 12: Renewable Energy – Hydroelectricity as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Commercial Operation / Term Commencement Date	Contract Expiry Date
Andrews Generating Station	47	1-Dec-09	Q4 2029
Appleton Eco Power Centre	1.4	1-Jan-11	Q4 2030
Aubrey Falls Generating Station	162	1-Dec-09	Q4 2029
Ayton Mills NUGS	0.3	1-Apr-13	Q2 2033
Barrie Small Hydro Limited	0.1	17-Jul-10	Q3 2030
Bracebridge Falls Generating Station	2.6	1-May-10	Q2 2030
Brewers Mills	0.9	1-May-10	Q2 2030
Burk's Falls	1.1	1-May-10	Q2 2030
Calm Lake Generating Station	9	1-Dec-09	Q4 2029
Campbellford-Seymour Electric Generation Inc. – Plant No. 1	2	1-Jan-10	Q4 2029
Casselman Generating Station	0.5	1-Nov-11	Q4 2031
Chaudiere No. 2. Generating Station	8.4	1-Apr-10	Q1 2030
Chaudiere No. 4 Generating Station	9.3	1-Apr-10	Q1 2030
Chiblow Lake Generating Station	1.65	1-Jul-14	Q3 2024
Clergue Generating Station	52	1-Dec-09	Q4 2029
Conestogo Dam Generating Station	0.6	1-Jan-13	Q1 2033
Current River Hydro	0.5	1-Mar-10	Q1 2030
Devil's Gap Generating Station	0.5	1-Jun-10	Q2 2030
Domtar, Espanola Mill	18	1-Jan-12	Q1 2032
Drag River GS	0.3	11-Mar-13	Q1 2033
Dunford Generating Station	45	1-Dec-09	Q4 2029
Enerdu Power Systems Ltd.	0.3	1-Mar-11	Q1 2031
Fort Frances Generating Station	10	1-Dec-09	Q4 2029
Galetta Eco Power Centre	1.6	1-Jan-11	Q4 2030
Gananoque	0.7	1-May-10	Q2 2030
Gartshore Generating Station	23	1-Dec-09	Q4 2029
Glen Miller Generating Station	8	19-Dec-05	Q4 2025
Harmon Generating Station	219	22-Jun-10	Q4 2065
Harris Generating Station	12	1-Dec-09	Q4 2029
Healey Falls Generating Station	15.7	7-Apr-10	Q2 2060
Heywood Generating Station	7.2	1-Jan-10	Q4 2029

High Falls Generating Station #1	0.8	1-Oct-10	Q3 2030
Hogg Generating Station	18	1-Dec-09	Q4 2029
Hollingsworth Generating Station	23	1-Dec-09	Q4 2029
Hound Chute Generating Station	9.5	27-Oct-10	Q4 2060
Hurdman Dam	0.6	1-Jun-11	Q2 2031
Iroquois Falls Generating Station	29	1-Dec-09	Q4 2029
Island Falls Generating Station	38	1-Dec-09	Q4 2029
Jones Falls	2.4	1-May-10	Q2 2030
Kagawong Generating Station	0.8	1-Jan-10	Q4 2029
Kenora Generating Station	6	1-Dec-09	Q4 2029
Kingston Mills	1.9	1-May-10	Q2 2030
Kipling Generating Station	235	22-Jun-10	Q4 2065
Lac Seul/Ear Falls Generating Station	29.3	18-Feb-09	Q1 2059
Little Burgess Generating Station	0.2	1-Aug-13	Q3 2033
Little Long Generating Station	207.5	22-Jun-10	Q4 2065
London Street Generating Station	4.1	1-Jan-10	Q4 2029
Long Slide GS	0.7	1-Mar-13	Q1 2033
Lower Sturgeon Generating Station	14	27-Oct-10	Q4 2060
MacKay Generating Station	62	1-Dec-09	Q4 2029
Maple Hill	0.6	1-Dec-10	Q4 2030
Marmora GS	1	27-Jul-13	Q2 2033
Matthias Generating Station	3	1-Jan-10	Q4 2029
McPhail Generating Station	13	1-Dec-09	Q4 2029
Minden Generating Station	4	1-Jan-10	Q4 2029
Mission Generating Station	16	1-Dec-09	Q4 2029
Moose Rapids Generating Station	1.4	1-Jan-11	Q4 2030
Norman Generating Station	9.5	1-Dec-09	Q4 2029
Parry Sound PowerGen Corporation – Cascade Street Generating Station	1.2	1-Mar-10	Q1 2030
Ragged Chute Eco Power Centre	6.6	1-Nov-13	Q2 2029
Rayner Generating Station	46	1-Dec-09	Q4 2029
Red Rock Falls Generating Station	41	1-Dec-09	Q4 2029
Renfrew Power Generation Inc. – Lower Plant	1	1-Jan-10	Q4 2029
Renfrew Power Generation Inc. – Upper Plant	1	1-Jan-10	Q4 2029
Rideau Falls	2	1-May-10	Q2 2030
Sandy Falls Generating Station	5.5	27-Oct-10	Q4 2060

Saugeen Generating Station	0.3	1-Aug-12	Q3 2032
Scone Generator	0.1	1-Jan-10	Q4 2029
Scott Falls Generating Station	22	1-Dec-09	Q4 2029
Shand Dam Generating Station	0.7	1-Sep-10	Q3 2030
Smoky Falls Generating Station	53	22-Jun-10	Q4 2015
Smoky Falls Generating Station (redevelopment)	268	30-Sept-14	Q3 2064
Stanley Adamson Powerhouse	3.9	16-Jun-13	Q2 2033
Steephill Generating Station	16	1-Dec-09	Q4 2029
Stewart Generating Station	0.2	5-Jun-10	Q2 2030
Sturgeon Falls Generating Station	7	1-Dec-09	Q4 2029
Swift Rapids Generating Station	7.9	1-Jan-10	Q4 2029
Tembec, Smooth Rock Falls Facilities	8	14-Mar-10	Q1 2030
Truisler Chute Generating Station	0.6	1-Jun-11	Q2 2031
Tweed Generating Station	0.2	1-Nov-10	Q4 2030
Twin Falls Generating Station	22	1-Dec-09	Q4 2029
Umbata Falls Generating Station	23	12-Nov-08	Q4 2028
Washburn	0.2	1-May-10	Q2 2030
Water Street Pumphouse	1.3	1-Mar-13	Q1 2033
Wawaitin Generating Station	15	27-Oct-10	Q4 2060
Wells Generating Station	239	1-Dec-09	Q4 2029
West Nipissing Power Generation	6.5	1-Mar-10	Q1 2030
Wilson's Falls	2.9	1-May-10	Q2 2030
York River Generating Station	0.6	1-Sept-13	Q3 2033
635294 Ontario Inc.	0.5	1-Feb-10	Q1 2030
1149377 Ontario Limited	2.3	1-Jan-10	Q4 2029
Subtotal	2,197		

Table 13: Table 13: Natural Gas and Biomass as of December 31, 2014

Contract Facility	Cogeneration Facility	Contract Capacity (MW)	Commercial Operation / Term Commencement Date	Contract Expiry Date
Birchmount Energy Centre	✓	2.6	23-Dec-13	Q4 2033
Bur Oak Energy Centre	✓	3.3	20-Feb-14	Q1 2034
Brighton Beach Power Station		541.3	01-Jan-06	Q3 2024
Chapleau Co-Generation Facility*	✓	5	11-Sept-14	Q3 2022
Durham College District Energy Project	✓	2.3	11-Mar-08	Q1 2028
East Windsor Cogeneration	✓	84	06-Nov-09	Q4 2029
Essar Cogeneration Facility*	✓	63	13-Jun-09	Q2 2029
Great Northern Tri-Gen Facility	✓	11.3	31-Oct-08	Q4 2028
Goreway Station		839.1	04-Jun-09	Q2 2029
Greenfield Energy Centre		1,005	16-Oct-08	Q4 2028
GTAA Cogeneration Plant	✓	90	01-Feb-06	Q1 2026
Halton Hills Generating Station		641.5	01-Sep-10	Q3 2030
Lennox Generating Station		2,000	01-Jan-13	Q3 2022
London Cogeneration Facility	✓	12	31-Dec-08	Q4 2028
Ottawa Health Sciences Centre		73.7	1-Jan-14	Q1 2034
Portlands Energy Centre		550	22-Apr-09	Q2 2029
Sarnia Regional Cogeneration Plant	✓	444	01-Jan-06	Q4 2025
St. Clair Energy Centre		577	30-Mar-09	Q1 2029
Sudbury District Energy Cogeneration Plant	✓	5	01-Jan-06	Q4 2024
Sudbury District Energy, Hospital Cogeneration	✓	6.7	01-Jan-06	Q4 2024
Thorold Cogen	✓	236.4	28-Mar-10	Q1 2030
Trent Valley Cogeneration Plant	✓	6.7	01-Jan-06	Q4 2015
Warden Energy Centre	✓	5	04-Jun-08	Q2 2028
Villa Colombo Vaughan	✓	0.2	14-Nov-13	Q3 2030
York Energy Centre		393	09-May-12	Q2 2032
Subtotal		7,598		

* Biomass fuel

Table 14: Nuclear Energy as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Term Commencement Date	Contract Expiry Date
Bruce A Units 1 – 4	3,000	31-Oct-05	Q4 2037
Subtotal	3,000		

Appendix III: Contracted Facilities Under Development¹³

Table 15: Korean Consortium Renewable Energy – Solar as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Scheduled Commercial Operation Date	Forecasted Contract Expiry Date
Southgate Solar Project	50	Q4 2016	Q4 2036
Grand Renewable Energy Park	100	Q1 2014	Q1 2034
Sol-Luce Kingston Solar Energy Project	100	Q4 2014	Q4 2034
Windsor Solar Project	50	Q4 2016	Q4 2036
Subtotal	300		

Table 16: Korean Consortium Renewable Energy – Wind as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Scheduled Commercial Operation Date	Forecasted Contract Expiry Date
Armow Wind Project	180	Q4 2014	Q4 2034
Belle River Wind Project	100	Q4 2016	Q4 2036
K2	270	Q3 2015	Q3 2035
Subtotal	550		

¹³ Does not include FIT Program and RESOP.

Scheduled Commercial Operation Dates are contractual dates and are not based on the project status provided by the supplier.

Table 17: Renewable Energy – Hydroelectricity as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Scheduled Commercial Operation Date	Forecasted Contract Expiry Date
Chaudiere Hydro GS2 Facility	29.4	Q1 2022	Q1 2062
First Chute Generating Station	1.7	Q1 2022	Q1 2062
Harmon Generating Station (Runner Upgrade)	17.6	Q4 2016	Q4 2066
London Street Generating Station (Expansion)	5.9	Q3 2015	Q3 2035
Norman Generating Station (Expansion)	4	Q3 2017	Q4 2029
Shickluna Hydro Electric Generating Station	4.2	Q1 2022	Q1 2062
Thomas Low Generating Station	1.5	Q1 2014	Q4 2029
Twin Falls Generating Station (Runner Upgrade)	5	Q4 2014	Q4 2029
West Nipissing Generating Station (Expansion)	1.8	TBD	TBD
Yellow Falls Hydroelectric Project	16	Q3 2016	Q3 2036
Subtotal	87		

Table 18: Natural Gas and Biomass as of December 31, 2014

Contract Facility	Cogeneration Facility	Contract Capacity (MW)	Scheduled Commercial Operation Date	Forecasted Contract Expiry Date
Hanlon Creek District Energy Project	✓	10.2	Q1 2019	Q1 2039
Green Electron Power Plant		289	Q3 2017*	Q3 2037
Moss Park CHP Facility	✓	0.8	Q4 2017	Q4 2037
Napanee Generating Station		900	Q4 2018	Q4 2038
Regent Park Cogeneration Facility	✓	2.7	Q4 2017	Q4 2037
Rosa Flora Growers	✓	4	Q4 2014	Q4 2034
Thunder Bay GS Unit 3 Conversion		135	Q1 2015	Q1 2020
Subtotal		1,342		

*This project's self-reported in-service date is Q3 2015.

Table 19: Natural Gas and Other Fuel Sources – Energy-from-Waste as of December 31, 2014

Contract Facility	Contract Capacity (MW)	Scheduled Commercial Operation Date	Forecasted Contract Expiry Date
Elementa Algoma	9.45	Q4 2018	Q4 2020 ¹⁴
Durham York Energy Centre	13.9	Q3 2016	Q3 2036
Subtotal	23		

¹⁴ With a right to extend the term to Q4 2038.

Appendix IV: Summary of RESOP and FIT Contracts

Table 20: RESOP as of December 31, 2014

Program	Fuel Source	Under Development (MW)	Commercial Operation (MW)	Total (MW)
RESOP	Bio-Energy	4	39.7	830.4
	Hydroelectric	0	28.2	
	Solar	0	473.7	
	Wind	0	284.9	
	Total	4	827	

Table 21: FIT Program as of December 31, 2014

Program	Fuel Source	Under Development (MW)			Commercial Operation (MW)	Total (MW)
		Pre-NTP	NTP	Total UD		
FIT 1	Bio-Energy	2.8	27.8	30.6	26.2	4,366.2
	Hydroelectric	117.9	45.5	163.4	22	
	Solar	8.1	264.2	272.3	888.9	
	Wind	1,148.7	529.4	1,678.1	1,284.7	
	Subtotal	1,277.5	867	2,144.4	2,221.8	
FIT 2	Bio-Energy	3.2	1	4.2	0	167.5
	Hydroelectric	0.1	0	0.1	0	
	Solar	35.7	114.3	150.1	13	
	Subtotal	39.1	115.3	154.4	13	
FIT 3	Bio-Energy	2	0	2	0	86.7
	Hydroelectric	0.1	0	0.1	0	
	Solar	84.6	0	84.6	0	
	Wind	0.1	0	0.1	0	
	Subtotal	86.7	0	86.7	0	
FIT	Grand Total	1,403.3	982.3	2,385.6	2,234.8	4,620.4
microFIT	Solar				173.82	173.9
	Wind				0.03	
	Subtotal				173.85	
Total (MW)		1,403.3	982.3	2,385.6	2,408.7	4,794.3

NTP = Notice to Proceed

UD = Under Development

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