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MINISTRY OF ENERGY

Feed-in Tariff (FIT) and microFIT Program Evolution

May 14, 2015

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- Evolution of the FIT Program
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Ground-mounted solar photovoltaic (PV) project (29 MW),
Township of Stone Mills, ON

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Introduction

- Ontario's Green Energy Act (GEA) was introduced in 2009 to expand renewable energy generation, encourage energy conservation and promote the creation of clean energy jobs
- As part of the GEA, the Feed-in Tariff (FIT) program was launched in September 2009
  - Ontario's FIT program provides a guaranteed pricing structure for renewable electricity production under long-term contracts.
  - Renewable sources include on-shore wind, solar photovoltaic (PV), hydroelectric, biogas, landfill gas, and biomass
- Since launching the FIT program, Ontario has firmly established itself as a North American leader in renewable energy

FIT 1 wind project (4 MW), Manitoulin Island, ON

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Feed-in Tariff (FIT) and microFIT Programs

FIT program

- Projects >10 kilowatts (kW) and up to 500 kW
- Currently open to wind, solar PV, hydroelectric and bioenergy applications
- 95% of FIT contracts have been for solar PV – majority being rooftop solar
- Open to individuals and companies

FIT 1 rooftop solar (PV) project (500 kW), Tecumseh, ON

microFIT program

- Small projects up to and including 10 kW
- Over 99% of projects are solar PV
- Continues to be a very popular and successful program with Ontario homeowners, schools, co-operatives and municipalities
- Ontario is examining the potential for microFIT to evolve from a generation purchasing program to a net metering program

FIT and microFIT Program Results

Large FIT (>500 kW)

- 205 contracted projects totalling ~4,110 megawatts (MW) of generation capacity. Out of these, 108 projects totalling ~2,000 MW are in commercial operation.*
  - Phase 1 – contract offers announced April 8, 2010
  - Phase 2 – contract offers announced February 24, 2011
  - Bruce to Milton – contract offers announced July 4, 2011

Small FIT (>10 kW up to 500 kW)

- 2,730 contracted projects totalling ~510 MW of generation capacity. Out of these, 1,294 projects totalling ~240 MW are in commercial operation.*
  - Phase 1 – contract offers announced March 10, 2010
  - Phase 2 – contract offers announced February 24, 2011 (offers had been made prior to the announcement)
  - Phase 3 – contract offers announced May 26, 2011
  - FIT 2 – contract offers announced July 3, 2013
  - FIT 3 – contract offers announced July 30, 2014 (123.5 MW FIT 3 and 15 MW Unconstructed Rooftop Solar Pilot Program)**
  - Extended FIT 3 – contract offers announced December 19, 2014 (100 MW)

microFIT (10 kW and smaller)

- More than 20,000 microFIT projects totalling more than 170 MW have come into operation.
- microFIT applications are received on an ongoing basis.

FIT 1 rooftop solar (PV) project (23kW)
Toronto, ON

* MWs are approximate and reflects Independent Electricity System Operator (IESO) data as at December 31, 2014.

** Small FIT MW total does not include all FIT 3 offers.

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Impetus for FIT/microFIT Program Changes

- Regular program reviews are a feature of FIT programs around the world.
- When the FIT program was launched , the September 24, 2009 Minister's Direction specified that the FIT program (including FIT prices) would be reviewed at least once every two years.
- Reviews help to build on the success of the program - continuing to ensure long-term sustainability, and transparency and predictability for industry and investors.
- The first FIT 2-Year Review was launched in October 2011 and the FIT 2-Year Review Recommendations Report was released in March 2012 – encompassing FIT and microFIT.

Large wind project (199.5 MW), Township of Melancthon, ON

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Impetus for FIT/microFIT Program Changes

- The FIT 2-Year Review featured extensive public consultation that included a webinar with about 1,700 participants, more than 2,900 responses to online survey questions, more than 200 written submissions and more than 80 meetings with associations, municipalities, community groups and companies.
- The revised program rules (FIT 2 / microFIT 2) reflected this broad stakeholder consultation and internal Ministry analysis that had been conducted during the review.
- Further review of the FIT program was undertaken in spring 2013 to examine ways to enhance municipal participation (FIT 3).

FIT 1 rooftop solar (PV) project (280 kW), Thunder Bay, ON

Evolution of the FIT Program: Summary

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Project sizes	Small FIT (10 kW – 500 kW) and Large FIT (larger than 500 kW)	Small FIT only	Small FIT only	Small FIT only
Procurement targets	None – only limited by grid capacity	Annual procurement target	Annual procurement target	Annual procurement target
Prioritization of applications	Timestamp (additional priority based on "shovel readiness" for first round only)	Priority for projects with Co-operative / Aboriginal partnership	Priority for projects with Co-operative / Aboriginal / Municipality or Public Sector partnership	Priority for projects with >50% Co-operative / Aboriginal / Municipality / Public Sector partnership; priority points for voluntary price reduction
Domestic content	Up to 60% for solar Up to 50% for wind	Up to 60% for solar Up to 50% for wind	None	None
Land use restrictions for ground-mounted solar	Restrictions on Prime Agricultural Land	Restrictions on Prime Agricultural Land, Restrictions on residential land	Restrictions on Prime Agricultural Land; Restrictions on residential land	Restrictions on Prime Agricultural Land; Restrictions on residential land; Municipalities can exempt projects from restrictions on residential land
Price reductions	N/A	Solar: ~20% on average Wind: ~15% on average (compared with FIT 1)	Solar: ~50% on average (compared with FIT 1)	Price review Fall of 2015. Priority points for voluntary price reduction.

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FIT Evolution: Project Sizes

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Project sizes	Small FIT (10 kW – 500 kW) and Large FIT (larger than 500 kW)	Small FIT only	Small FIT only	Small FIT only

- Initially, FIT and microFIT included projects of all sizes:
  - **microFIT** – projects up to and including 10 kW of generation capacity – e.g. rooftop solar on a home, or a library, small ground-mounted solar on farm – evolution of microFIT program is covered in the next section
  - **Small FIT** – projects larger than 10 kW, generally up to and including 500 kW – e.g. commercial rooftop solar, farm-based biogas system, small / micro-hydro
  - **Large FIT** – projects generally larger than 500 kW – e.g. large wind projects on land leased from farmers, large ground-mounted solar – no upper size limit.

microFIT rooftop solar (PV) project (≤ 10 kW), Kingston, ON

- On June 12, 2013, the Minister of Energy directed the IESO not to procure further large projects under the FIT program
  - Future large projects (generally >500 kW) are subject to the new Large Renewable Procurement (LRP) – designed to give municipalities a stronger voice
  - Small projects continue to be procured under the FIT program.

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FIT Evolution: Targets and Prioritization

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Procurement targets	None – only limited by grid capacity	Annual procurement target	Annual procurement target	Annual procurement target

- 2013 Long-Term Energy Plan targets:
  - Combined FIT/microFIT procurement target of 900 MW between 2013 and the end of 2017; annual procurement targets of 150 MW for FIT, 50 MW for microFIT starting in 2014 – to provide industry with predictability and stability

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Prioritization of applications	Timestamp (additional priority based on "shovel readiness" for first round only)	Priority for projects with Cooperative /Aboriginal partnership	Priority for projects with Cooperative/ Aboriginal/ Municipality or Public Sector partnership	Priority for projects with >50% Co-operative / Aboriginal / Municipal / Public Sector partnership; priority points for voluntary price reduction

- Since grid connection capacity may be limited in certain areas, the FIT program allocates available capacity by prioritizing certain projects
  - FIT 1 priority was "first come first served", with priority under first round for "shovel ready" projects that conducted development work prior to FIT
  - Following the FIT 2-Year Review (2012), new small FIT projects with equity participation from co-operatives or Aboriginal communities were prioritized
  - FIT 3 added priority consideration for municipal or public sector participation projects.

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FIT Evolution: Domestic Content

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Domestic content	Up to 50% for wind, up to 60% for solar	Up to 50% for wind, up to 60% for solar	None	None

- Ontario content (domestic content, or DC) requirements were included in the initial FIT program rules
  - Introduced to help ensure that equipment and labour required to support renewable energy generation in Ontario created jobs here in the province
  - Developers of FIT solar and wind projects were required to perform enough "designated activities" to meet the minimum % DC target
  - Activities included equipment manufacturing, and services – various combinations could be used to meet the targets
- In May 2013, the World Trade Organization (WTO) Appellate Body found that Ontario's DC requirements violate international trade agreements
  - July 24, 2014 – amendment to Electricity Act, 1998 to remove DC requirements
  - No DC requirements in FIT 3 contracts
  - Combined with other measures, the removal of domestic content requirements is expected to save ratepayers $1.9 billion on FIT projects over the next 25 years.

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FIT Evolution: Land Use Restrictions and Price Reductions

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Land use restrictions for ground-mounted solar	Restrictions on Prime Agricultural Land	Restrictions on Prime Agricultural Land; Restrictions on residential land	Restrictions on Prime Agricultural Land; Restrictions on residential land	Restrictions on Prime Agricultural Land; Restrictions on residential land; Municipalities can exempt projects from restrictions on residential land

- Restrictions on use of Prime Agricultural Land were included in FIT 1 rules to balance development opportunities for ground-mounted solar projects with protection of farmland - restrictions were tightened in FIT 2 & 3
- In response to concerns from municipalities and residents, FIT 2 & 3 included restrictions on ground-mounted solar projects in residential areas

	FIT 1	FIT 2	FIT 3	FIT 4 (draft rules)
Price reductions	N/A	Solar: ~20% on average Wind: ~15% on average (compared with FIT 1)	Solar: ~50% on average (compared with FIT 1)	Price review to be completed Fall 2015. Priority points for voluntary price reduction.

- Annual price reviews were initiated starting with FIT 2
- FIT / microFIT prices for new projects have been updated to reflect current costs – see price chart in Appendix A for more details.

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Evolution of the microFIT Program: Summary

	microFIT 1	microFIT 2	microFIT 3 & 4
Eligible participants	Commercial aggregators restricted from program starting summer 2010; participation limited to certain groups, such as homeowners, farmers, institutions	Participation limited to certain groups, such as homeowners, farmers, institutions Individuals and farmers cannot have more than one project	No change from microFIT 2
Procurement targets	None – only limited by grid capacity	Annual procurement target	Annual procurement target
Grid capacity testing	Requirement for grid capacity testing introduced Dec. 8, 2010	Grid capacity testing	Grid capacity testing
Domestic content	Up to 50% for wind, up to 60% for solar	Up to 50% for wind, up to 60% for solar	None – starting July 25, 2014 and onward
Land use restrictions for solar, and wind <=3kW	No restrictions	Restrictions on: residential land with exemption for agricultural land; for solar only, restriction on commercial/industrial land if it is the primary use	No change from microFIT 2
Price reductions	Reduction of ground-mounted solar price in summer 2010	Solar rates reduced by over 40% on average (compared with initial microFIT 1 prices in 2009)	Solar rates reduced by close to 60% on average (compared with initial microFIT 1 prices in 2009)

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microFIT Evolution: Eligibility and Targets

	microFIT 1	microFIT 2	microFIT 3 & 4
Eligible participants	Commercial aggregators restricted from program starting summer 2010; participation limited to certain groups, such as homeowners, farmers, institutions	Participation limited to certain groups, such as homeowners, farmers, institutions Individuals and farmers cannot have more than one project	No change from microFIT 2

- Initial microFIT rules allowed companies to apply
  - Restrictions on commercial participants were introduced in summer 2010, in order to maintain the program focus on homeowners, farmers
  - microFIT "Eligible Participants" include individuals, farmers, co-operatives, municipalities, Local Distribution Companies (LDCs), education and health institutions, Aboriginal communities, faith-based organizations

	microFIT 1	microFIT 2	microFIT 3 & 4
Procurement targets	None – only limited by grid capacity	Annual procurement target	No change from microFIT 2

- 2013 Long-Term Energy Plan targets:
  - Combined FIT/microFIT procurement target of 900 MW between 2013 and the end of 2017; annual procurement targets of 150 MW for FIT, 50 MW for microFIT starting in 2014 – to provide industry with predictability and stability

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microFIT Evolution: Grid Capacity and Domestic Content

	microFIT 1	microFIT 2	microFIT 3 & 4
Grid capacity testing	Requirement for grid capacity testing introduced Dec. 8, 2010	Grid capacity testing	No change from microFIT 2

- Initially, microFIT program did not include testing for grid capacity
- Some microFIT projects moved ahead in the process, but later found that they could not connect to the grid
- Relocation/remediation was undertaken for affected projects
- Grid capacity testing was introduced December 8, 2010 – microFIT applicants must receive an "offer to connect" from their Local Distribution Company in order to proceed with their application

	microFIT 1	microFIT 2	microFIT 3
Domestic content	Up to 50% for wind, up to 60% for solar	Up to 50% for wind, up to 60% for solar	None – starting July 25, 2014 and onward

- Evolution of domestic content – same as for FIT program

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microFIT Evolution: Land Use Restrictions and Price Reductions

	microFIT 1	microFIT 2	microFIT 3 & 4
Land use restrictions for solar, and wind <=3kW	No restrictions	Restrictions on: residential land with exemption for agricultural land; for solar only, restriction on commercial/ industrial land if it is the primary use	No change from microFIT 2

- In response to concerns from municipalities and residents, microFIT 2, & 3 included restrictions on ground-mounted solar projects and small wind projects (<=3 kW) in residential areas; microFIT 4 remains consistent.

	microFIT 1	microFIT 2	microFIT 3 & 4
Price reductions	Reduction of ground-mounted solar price in summer 2010	Solar rates reduced by over 40% on average (compared with initial microFIT 1 prices in 2009)	Solar rates reduced by close to 60% on average (compared with initial microFIT 1 prices in 2009)

- Ground-mounted solar microFIT price reduced in 2010 to better align with system costs and electricity output – reducing impact to ratepayers
- Annual price reviews were initiated starting with microFIT 2
- FIT / microFIT prices for new projects have been updated to reflect current costs – see price chart in Appendix A for more details

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Appendix A: FIT and microFIT Price Chart

Feed-in-Tariff Program Pricing (¢/kWh)						
Renewable Fuel	Size tranches	Sep 24, 2009	April 5, 2012	Jan 1, 2014	Sep 30, 2014/ Jan 1, 2015	% Change from 2009 Price
Solar PV						
Rooftop	≤ 10 kW	80.2	54.9	39.6	38.4	-52.1%
	> 10 ≤ 100 kW	71.3	54.8	34.5	34.3	-51.9%
	> 100 ≤ 250 kW		53.9	32.9	31.6	-50.2%
	> 250 ≤ 500 kW	63.5				
	> 500 kW	53.9	48.7	N/A	N/A	N/A
Solar PV						
Non-Rooftop	≤ 10 kW	80.2	44.5	29.1	28.9	-64.0%
	> 10 ≤ 500 kW	44.3	38.8	28.8	27.5	-37.9%
	> 500 kW ≤ 5 MW		35	N/A	N/A	N/A
	> 5 MW		34.7			
Biogas						
On-Farm Biogas	≤ 100 kW	19.5	19.5	26.5	26.3	34.9%
	> 100 kW ≤ 250 kW	18.5	18.5	21	20.4	10.3%
Biogas	≤ 500 kW	16	16	16.4	16.8	5.0%
	>500 kW ≤ 5 MW	14.7	14.7	N/A	N/A	N/A
	> 5 MW	10.4	10.4			
Biomass						
	≤ 500 kW	13.8	13.8	15.6	17.1	23.9%
	> 500 kW ≤ 10 MW			N/A	N/A	N/A
	> 10 MW	13	13			
Landfill Gas						
	≤ 500 kW	11.1	11.1	7.7	17.1	54.1%
	> 500 kW ≤ 10 MW			N/A	N/A	N/A
	> 10 MW	10.3	10.3			
Wind						
Onshore	≤ 500 kW	N/A	N/A	11.5	12.8	-5.2%
	All sizes	13.5	11.5	11.5	12.8	
Waterpower						
	≤ 500 kW	13.1	13.1	14.8	24.6	87.8%
	> 500 kW ≤ 10 MW			N/A	N/A	N/A
	> 10 MW ≤ 50 MW	12.2	12.2			

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