Maximizing the Benefits of Early Success:

Recommendations for the Sustainability of Ontario's Solar Energy Sector

A Submission to the Ontario Ministry of Energy
for the FIT Program Scheduled Review Consultation,
December 14, 2011

Canadian Solar Industries Association (CanSIA)
www.cansia.ca

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About the Canadian Solar Industries Association (CanSIA)

The Canadian Solar Industries Association (CanSIA) is the national trade association that represents over 650 solar energy companies throughout Canada and over 500 in the province of Ontario. Since 1992, CanSIA has worked to develop a strong and efficient Canadian solar energy industry with capacity to provide innovative solar energy solutions and to play a major role in the global transition to a sustainable, clean-energy future. CanSIA focuses on being a factual, constructive and collaborative stakeholder and is the trusted and credible voice of the Canadian solar energy industry.

Executive Summary

This document presents recommendations prepared by the Canadian Solar Industries Association (CanSIA) in consultation with over 500 of our member companies with operations in the province of Ontario, to the Government of Ontario for their review of the microFIT and FIT programs.

Ontario is becoming a world leader in the global transition to a clean energy future thanks to the Government of Ontario's bold commitments to solar and renewable energy and energy conservation.

Since the introduction of the Province's Green Energy and Green Economy Act (GEGEA) and microFIT and FIT programs in 2009, Ontario's solar energy sector has made significant advances since the introduction of the province's Green Energy and Green Economy Act in 2009 creating 8,200 jobs and investing $2 billion in the province in 2011. Additionally, solar PV provides peak shaving capacity during the day, when electricity demand in Ontario is at its greatest and electricity costs are at their highest.

To ensure the long-term sustainability of the Ontario solar energy and solar manufacturing industry, an annual Ontarian market size of ≥500 MW is required. By procuring approximately 4,660 MW under the LTEP Generation portion (e.g. small-scale and large-scale PV) and an additional up to 200 MW per year to 2018 under the LTEP conservation portion (e.g. micro-scale PV) the Ontario solar manufacturing industry will have the annual MW market size required in the province to be sustainable and compete on the global stage.

Breaking down the solar PV MW totals by project size leading up to 2018 reveals the following:

- Up to 1,280 MW of micro-scale PV (≤30 kW)
- 1,864 to 2,796 MW of small-scale PV (>30 kW ≤ 1 MW)
- 1,864 to 2,330 MW of large-scale (>1 MW ≤ 10 MW)

By achieving these solar PV targets in Ontario, the solar industry is estimated to create an average annual 17,000 solar energy jobs in the province.

The Government must remain committed to accelerating Ontario's North American leadership role in the transition to green energy and a green economy. Furthermore the Ontario Ministry of Energy must take a leadership role to encourage Ontario Local Distribution Companies, particularly Hydro One, to connect more solar PV projects to the Ontario electrical grid system. No matter how well structured, efficient or robust the new FIT program process becomes, if solar PV continues to experience challenges connecting to the grid, Ontario will not become a green energy leader and momentum generated thus far will largely be lost.

This submission makes a number of recommendations related to Micro-Scale PV, Small-Scale PV and Large-Scale PV in addition to recommendations for new technologies to be considered.

CanSIA supports a long-term vision for solar that includes targets and a long-term price degression mechanism to set a course for solar energy rates to trend downward. The implementation of price degression models will assist to set a path for the price of solar electricity in Ontario to continually decrease over time toward grid parity while introducing pricing stability, transparency and predictability to ensure investor confidence.

CanSIA further supports the reduction in FIT rates to reflect the figures presented in the following table.

Program		Size of system (kW_{AC})	2010/2011 ($/kWh)	2012 ($/kWh)	Change (%)
microFIT	Rooftop	> 0 kW ≤ 5 kW	0.802	0.695	-13.30%
microFIT	Rooftop	> 5 kW ≤ 10 kW	0.802	0.65	-19%
microFIT	Rooftop	> 10 kW ≤ 30 kW	0.713	0.60 to 0.63	-12 to -16%%
FIT	Rooftop	> 30 kW ≤ 150 kW	0.713	0.60 to 0.63	-15.4 to -15.8%
FIT	Rooftop	>150 kW ≤ 1 MW	0.713 to 0.635	0.53 to 0.55	-14.9 to -24.2%
microFIT	Ground Mounted	> 0 kW ≤ 10 kW	0.642	0.594	-7.5%
FIT	Ground Mounted	> 10 kW ≤ 1 MW	0.443	0.443	0%
FIT	Ground Mounted	> 1 MW ≤ 10 MW	0.443	Reduce by > 20%	Reduce by > 20%

Furthermore Ontario should re-establish itself as the Canadian leader in Solar Thermal technology and transition to see the current FIT Program model be expanded to include mechanisms to incentivize solar hot water and solar air technologies.

The recommendations presented in this document offer solutions, within the framework of Ontario's Long Term Energy Plan (LTEP), to create the stability and visibility required to build on the initial successes of Ontario's nascent solar photovoltaic (PV) energy and solar PV manufacturing industry. Furthermore, these recommendations provide the long-term stability required as the solar industry matures to compete on the global stage without the need for government financial incentives.

1. Introduction

Ontario is becoming a world leader in the global transition to a clean energy future thanks to the Government of Ontario's bold commitments to solar and renewable energy and energy conservation.

Most notably, Ontario is quickly rising to the top of the ranks for solar energy. Since the introduction of the Province's Green Energy and Green Economy Act (GEGEA) and microFIT and FIT programs in 2009, Ontario's solar photovoltaic (PV) industry has delivered significant benefits to the province[1]:

- Created over 8,200 new jobs in Ontario in 2011 (expected to grow to over 11,000 in 2012).
- Invested $2 billion in Ontario in 2011.
- Established or expanded more than 35 manufacturing operations in the province in the wake of the global economic recession during a time when Ontario's manufacturing industry has struggled to sustain its operations and workforce.

Solar energy presents an opportunity for Ontario to accelerate its transition toward a clean, renewable energy future bringing further significant prosperity for generations to come through local economic development, job creation and environmental protection.

This document prepared by CanSIA in consultation with our membership, presents the results of an extensive consultation process undertaken with over 500 member companies operating in the province of Ontario to inform the Government of Ontario's Scheduled FIT Program Review (See Appendix 1).

The recommendations presented in this document offer solutions, within the framework of Ontario's Long Term Energy Plan (LTEP), to create the stability and visibility required to build on the initial successes of Ontario's nascent solar photovoltaic (PV) energy and solar PV manufacturing industry. Furthermore, these recommendations provide the long-term stability required as the solar industry matures to compete on the global stage without the need for government financial incentives.

In addition to the benefits and opportunities of solar PV in Ontario, there is significant potential to build upon our province's early success with solar thermal technologies, and to expand the scope of the FIT Program to include these technologies. Prior to the GEGEA, the Ontario Ministry of Energy distinguished itself as a pioneer in the area of solar thermal with their market-leading *Ontario Solar Thermal Heating Incentive (OSTHI) Program*. This program supported solar air and water heating technologies and catapulted Ontario to the forefront of the solar thermal market in Canada, with more than 55% of all Canadian projects being installed in Ontario in 2010.

CanSIA appreciates the opportunity to provide information to the Government of Ontario on these issues at this time and welcomes the potential for future partnership.

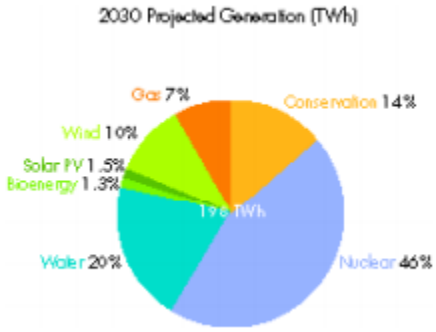
[1] ClearSky Advisors Inc. (2011) "The Economic Impacts of the Solar Photovoltaic Sector in Ontario 2008-2018"

2. The Role of Solar in Ontario's Long Term Energy Plan

Energy supply in Ontario will undergo significant changes over the next 20 years, driven by the need to replace and/or refurbish the existing aging fleet of electricity generating facilities (including all coal-fired plants) while meeting the needs of a growing population.

- By 2030, almost 70% of required electricity generation will need to come from new or refurbished electricity generating facilities.
- Despite conservation efforts, demand for electricity is expected to increase by 15% from 2010 to 2030.

To prepare for these changes, the Ontario Government has developed a Long-Term Energy Plan (LTEP) for the province's electricity system in order to transition to a cleaner, more modern and dependable system for current and future generations through greening the energy supply and energy conservation.



Source: Ontario Ministry of Energy (2011)
"Ontario's Long Term Energy Plan: Building Our Clean Energy Future"

Electricity Supply: Solar PV provides peak power in periods when Ontario needs it the most. Solar PV provides peak shaving capacity during the day, when electricity demand in Ontario is at its greatest and electricity costs are at their highest. Since solar PV is available during peak demand periods, it offsets the electricity generated from other available sources of energy, primarily coal and natural gas. In this context, solar PV plays an important role in the province's renewable generation portfolio reducing the environmental impacts associated with conventional peak power sources.

By 2030, the LTEP calls for the vast majority of electricity generation in Ontario to come from nuclear power (46 percent), hydro-electricity (20 percent), wind (10 percent), and natural gas (7 percent) and for conservation measures to reduce demand by 14 percent.

The LTEP sets a target of 10,700 MW of renewable generation (excluding hydroelectric) by 2018. Further, the LTEP has called for 1.5 percent of total generation in Ontario to come from solar PV by 2030. In accordance with these targets, CanSIA believes that approximately 3,000 MW_{DC} of solar PV would be required to provide this targeted amount of electricity in the supply mix.

Conservation and Demand Side Management (CDM): Ontario is already a North American leader in conservation with over 1,700 MW conserved since 2005. The conservation target in the LTEP is 7,100 MW and 28 TWh by 2030. This represents the equivalent of removing 2.4 million homes from the electrical grid. This level of conservation will reduce Ontario's greenhouse gas emissions by up to 11 mega-tonnes annually by 2030. These targets are among the most aggressive in North America.

The distributed application of small-scale solar energy technologies is an extremely viable method to achieve CDM by producing energy locally minimizing the need to transport electricity, energy or fuels over great distances.

The current definition of Conservation and Demand Side Management (CDM) (in the LTEP) includes load reduction from initiatives such as solar heating and fuel switching and customer-based generation for the purpose of load displacement. However, the definition excludes generation that is contracted for under the OPA's microFIT and FIT Programs and other generation that is separately metered for the purpose of injecting electricity into the transmission or distribution system.

However, as part of the GEGEA, Local Distribution Companies (LDCs) will become a more recognizable "face of conservation" and have been assigned conservation targets that must be met as a condition of their license. Specifically, LDCs will meet their targets through a combination of province-wide and local conservation programs.[2] There is a great opportunity to contribute directly to conservation and peak demand reduction with microFIT systems on rooftops while also engaging the LDCs.

In addition to the opportunities presented by solar PV, solar thermal technologies can directly contribute to meeting the province's CDM targets. Solar water heating can displace electrical water heating during peak demand periods, thereby providing distributed demand reduction at times when electrical generation costs are the highest. In this context, solar water heating is a cost-effective and efficient opportunity for both renewable energy generation and conservation.

Solar thermal technologies also provide significant opportunities to displace fuels other than electricity by addressing the largest usage of energy in buildings in Ontario, which is indoor space and water heating.

Setting Solar Targets: Clear market stability and visibility is required to provide solar PV manufacturers with the confidence to continue investing in Ontario. The lack of an explicit long-term policy target for solar PV has raised speculation about potential PV market saturation and possible future changes in policy direction that might materially change the trajectory of solar PV penetration. One of the key opportunities for introducing stability to the Ontario solar market will be to confirm the amount of solar that will be procured to 2018 defined by their applicable market segment tranche.

To ensure the long-term sustainability of the Ontario solar PV manufacturing industry an annual market size of ≥500 MW is required. By procuring approximately 4,660 MW under the LTEP Generation portion (e.g. small and large PV) and an additional up to 200 MW per year to 2018 under the LTEP conservation portion (e.g. micro-scale PV) the Ontario solar PV manufacturing industry will have the annual MW market size required in the province to be sustainable and compete on the global stage (See Appendix 2).

[2] Ontario's Long Term Energy Plan , 39.

A solar energy market of this size would employ an average annual Ontarian labour force of up to 17,000.[3]

Breaking down the solar PV MW totals by project size, in 2018 Ontario reveals the following:

- Up to 1,280 MW of micro-scale PV (≤30 kW)[4]
- 1,864 to 2,796 MW of small-scale PV (>30 kW ≤ 1 MW)[5]
- 1,864 to 2,330 MW of large-scale (>1 MW ≤ 10 MW)[6]

With an estimated 2,260 MW of solar currently contracted under the FIT Program, an additional 2,400 MW is required under the LTEP Generation portion to meet a total of 4,660 MW of solar PV on the Ontario grid by 2018 (including small and large PV while now allocating micro-scale PV to LTEP conservation). Although the 4,660 MW could fit within the LTEP, CanSIA understands that there may only be 1,000 to 2,000 MW of available capacity remaining for renewable electricity excluding hydro power.

In context of the LTEP, Solar PV capacity could benefit from advancements in the following areas:

- Accelerated transition to a modern or smart grid electrical system;
- Grid infrastructure upgrades expected to take place due to Ministry of Energy directives;
- Increased technical understanding between LDCs and the solar industry on the topic of connecting renewables to the Ontario electrical grid system;
- Allocating microFIT solar PV projects to the conservation portion under the LTEP as a demand side management initiative;
- Attrition from renewable energy projects already contracted. For example, freed up capacity due to attrition from FIT 1.0 should be reallocated to FIT 2.0 projects.
- Phase out of coal-fired generating stations in the short-term and possibly the phase out of nuclear facilities over the long term.

[3] Reference: Canadian Solar Industries Association
[4] See Appendix 2
[5] Small Solar PV MW Range equals 40 to 60 percent of 4660 MW total
[6] Large Solar PV MW Range equals 40 to 50 percent of 4660 MW total

3. Recommendations

CanSIA's recommendations were formulated through a comprehensive industry consultation process of over 500 of our member companies active in Ontario and key industry stakeholders that adopted a factual, constructive and collaborative approach (See Appendix 1).

The recommendations presented in this report are categorized as follows:

- Ontario Energy Policy and Regulatory Framework.
- Connecting Solar to the Grid.
- FIT Pricing Schedule Amendments and Price Degression.
- Sustaining Ontario's Manufacturing Sector.
- Micro-Scale Market Sector (≤ 30 kW).
- Small-Scale Market Sector (>30 kW ≤ 1 MW).
- Large-Scale Market Sector (≥1 MW).
- New Technologies.

3.1 Ontario Energy Policy and Regulatory Framework

Leadership from the Government of Ontario: The goals defined by the province's Green Energy and Green Energy Act set a course for Ontario to become a global clean energy leader.

CanSIA recommends that the Government of Ontario:

a. *Remain committed to accelerating Ontario's North American leadership role in the transition to green energy and a green economy.*

b. *Redefine the role of solar photovoltaics in the province's electricity procurement to 2018 to accelerate the province's transition to a clean energy future and to develop the province's nascent solar manufacturing sector by i) procuring up to an additional 200 MW per year from micro-scale systems in support of the province's Conservation and Demand Side Management targets and ii) achieving 4.66 GW of small-and large-scale solar photovoltaic facilities in operation in the province by the end of 2018.*

c. *Re-establish Ontario as the Canadian leader for Solar Thermal technology by ensuring that the energy policy framework evolves to account for the suitability of solar heating and cooling technology for meeting the province's significant thermal energy demands and for electrical load displacement.*

3.2 Connecting Solar to the Grid

The single largest barrier to the advancement of Ontario's solar energy industry is the inability of many solar PV projects to connect to the province's electrical grid system. No matter how well structured, efficient or robust the new FIT program process becomes, if solar PV continues to experience challenges connecting to the grid, Ontario will not become a green energy leader and momentum generated thus far will largely be lost.

According to the Ontario Energy Board (OEB), the "The *Green Energy Act, 2009* establishes important responsibilities for the Ontario Energy Board and other entities in achieving the objectives of conservation, promotion of renewable generation, and technological innovation through the smart grid."[7]

As amended by the GEGEA, the Ontario Energy Board Act, 1998[8] states that the OEB has a number of priorities including two of the following:

- To facilitate the implementation of a smart grid in Ontario.
- To promote the use and generation of electricity from renewable energy sources in a manner consistent with the policies of the Government of Ontario, including the timely expansion or reinforcement of transmission systems and distribution systems to accommodate the connection of renewable energy generation facilities.

Although the promotion of renewable energy, including the timely connection of renewable energy projects to transmission and distribution systems, is well identified as a key objective by the OEB[9], there remains a great deal of frustration and confusion within the industry to this respect.

With any new program or initiative, there is bound to be a learning curve that all stakeholders must move along and that is expected. It is also understood that the Ontario electrical transmission and distribution system was not initially built for distributed energy. As stakeholders have proceeded, with the launch of the FIT Program, it has become apparent that there are challenges and misconceptions that may be impacting the amount of solar energy that can or should be connected to the Ontario grid system. This has made it extremely difficult to develop a clear business outlook for solar in Ontario.

Over the past 12 months, CanSIA has opened up lines of communications with Local Distribution Companies (LDCs). These efforts were made in an attempt to learn more about the technical and regulatory issues that have prevented many solar projects from being connected to the transmission or distribution system and to educate LDCs about how solar energy integrates into the grid system. In particular, CanSIA and Hydro One have held 'Technical Roundtable' sessions and are also taking part in a joint technical study. These sessions have provided a good means to better understand the information and challenges on both

[7] http://www.ontarioenergyboard.ca/OEB/Industry/Regulatory+Proceedings/Policy+Initiatives+and+Consultations/Green+Energy+Initiatives
[8] http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_98o15_e.htm#BK1
[9] http://www.ontarioenergyboard.ca/OEB/Industry/Regulatory+Proceedings/Policy+Initiatives+and+Consultations/Green+Energy+Initiatives

sides, however up to now these sessions have not resulted in tangible outcomes that would increase the system capacity for connecting additional solar projects.

CanSIA understands that LDCs must ensure that their grid systems are safe and reliable - that goes without question. However with that said the industry believes that the LDCs, including Hydro One and others, are being overly conservative in the manner in which they approach and deal with solar PV on both their transmission and distribution systems.

To meet the objectives of the Green Energy and Green Economy Act, particularly to establish a green energy manufacturing industry in the Province, it is crucial that all solar energy stakeholders deal with the challenges, realities and misconceptions of connecting more solar PV to the electrical grid system. The long-term sustainability of the solar manufacturing and solar energy industry in Ontario hinges on this very issue.

CanSIA recommends that the Ontario Ministry of Energy:

a. *Take a leadership role to encourage Ontario Local Distribution Companies, particularly Hydro One, to connect more solar PV projects to the Ontario electrical grid system.*

b. *Establish a multi-stakeholder 'Connecting Renewables' Task Force in conjunction with the Ontario Energy Board.*

The existence of the Task Force should be ongoing however the short-term focus should be to:

- Determine appropriate Solar PV penetration level for the Ontarian transmission and distribution systems with a view to increase the maximum penetration level beyond the 7 percent currently imposed by many Local Distribution Companies (LDC's).

- Determine smart grid technologies that can be applied today which enable the connection of more solar PV.

Furthermore the Task Force medium- and long-term focus should be to:

- Determine the technical, regulatory and/or policy barriers that may be inhibiting the connection of more solar PV on the Ontario transmission and distribution system.

- Determine the next steps through a 'Connecting Renewables Roadmap', to connect more solar PV projects.

- Determine the cost implications to the established next steps. Furthermore determine the best policy or industry mechanisms to address the cost implications. Special attention should look at the Distribution and Transmission Codes to see where cost mechanisms can be streamlined line to increase the overall cost efficiency and viability to the overall FIT program.

Note: Pushing costs to project developers does not necessarily lower the cost to the end consumers if they are to be reflected in the FIT rates regardless. Socializing costs may mean greater program and financial efficiency, thus lower project developer risks and costs, as opposed to LDCs being responsible for collecting multiple developer funds to cover grid enabling fees.

- Establish best practices for all LDCs and solar project developers for connecting solar PV to both the transmission and distribution system.

- Explore incentive models for LDCs to encourage them to connect addition solar PV to the grid system.

- Use the assistance of third party consultants and international industry experts where applicable to assist in research and technical discussions.

The micro-FIT Technical Inter-Connection Requirements (TIR) established by Hydro One in February 2011 was a significant setback for microFIT solar PV projects in Ontario. These requirements were established with no input or prior discussion with industry. It is CanSIA's understanding that the FIT TIR document of has recently been revised through a consultation process with industry supported by two webinars[10]. The microFIT TIR should receive equal consultation in its development and revisions.

CanSIA recommends that the Ontario Ministry of Energy:

c. Establish a Hydro One Technical Review Committee to review all significant directional changes or new initiatives that Hydro One proposes that impact the solar industry.

The committee would be made up of an effective cross section of industry, technical experts and regulatory experts. This committee could be a sub task-force of the recommendation made above. Given the far reaching consequences that Hydro One's decisions have, it is important that a strong stakeholder consultation process be put in place. This process should be under the leadership of the Ministry of Energy or the Ontario Energy Board.

Note: CanSIA understands this model is already operational within the IESO, and has served as a very effective tool for ensuring all aspects and potential consequences are contemplated by stakeholders prior to policies or plans being executed. Decisions that Hydro One makes have the potential to affect other LDCs, generators, developers, load customers, municipalities, and other provincial entities such as the Ministry of Energy, OPA, and the IESO.

CanSIA recommends that the Ontario Ministry of Energy:

[10] Hydro One (http://www.hydroone.com/Generators/Pages/Webinars.aspx)

d. *Establish greater clarity and transparency to both transmission and distribution system planning.*

In particular, the process and interaction underlying the DAT, TAT and ECT need to be clarified in addition to greater clarity on capacity calculations. CanSIA understands that there is a plan to implement Smart Grid technology however the scope and timelines for this initiative is not well understood. Further clarity and input into this planning process is required and can be implemented through the other recommendations made above.

3.3 FIT Pricing Schedule Amendments and Price Degression

The prices paid for solar electricity during the first two years of the FIT Program have been successful in stimulating market activity, building the supply chain and manufacturing base and creating jobs.

Price reductions have been achieved during this time through the development of Ontario's supply chain and solar industry capacity and through the market reaching scale. The solar energy industry is now in a position to continue to grow and create jobs and investment in the Ontario economy while receiving lower and lower prices for the solar electricity generated. However, at present there is no Price Degression mechanism for this to occur in a stable and predictable manner.

The priority recommendations in this section for FIT Pricing Schedule Amendments and Price Degression solar market sector present solutions that:

- Set a path for the price of solar electricity in Ontario to continually decrease over time toward grid parity.
- Will deliver solar electricity to Ontario's electricity customers at a lower cost while ensuring a reasonable rate of return for investors.
- Introduce pricing stability, transparency and predictability to ensure investor confidence.

Introduce New Tranches: Experience gained by the solar energy industry in the past two years have identified opportunities to amend the existing FIT Pricing tranches to become better aligned with the cost-breaks for development (and to stimulate the development of more smaller-scale systems than currently being experienced).

CanSIA recommends to:

a. *Divide the microFIT rooftop tranche (> 0 ≤ 10 kW) into the following two tranches for rooftop systems: i) > 0 ≤ 5 kW and ii) > 5 ≤ 10 kW to stimulate the installation of more small residential rooftop systems. (See Section 4.5 for further discussion).*

b. *Increase the upper limit of the rooftop microFIT tranche from 10 kW to 30 kW to enable increased participation in the program for smaller systems on the roofs of commercial properties. (Subject to further recommendations, see Section 3.5).*

c. *Introduce a new tranche for 'smallFIT' (> 30 ≤ 150 kW) to increase the participation in the program for systems that have a larger capacity than micro-scale but are smaller than 250 kW. This recommendation infers that the existing rooftop FIT tranches are merged to a new 'standardFIT' tranche (≥ 150 ≤ 1 MW).*

d. *Introduce a new tranche for ground mount projects (≥ 10 kW ≤ 1 MW) to encourage the development of ground mount projects smaller than 10 MW.*

New Pricing Schedule: CanSIA supports the downward revision of pricing in the FIT Pricing Schedule.

CanSIA recommends to:

e. Amend the FIT Pricing Schedule for 2012 to reflect the figures presented in the following table.

Program		Size of system (kW_{AC})	2010/2011 ($/kWh)	2012 ($/kWh)	Change (%)
microFIT	Rooftop	> 0 kW ≤ 5 kW	0.802	0.695	-13.30%
microFIT	Rooftop	> 5 kW ≤ 10 kW	0.802	0.65	-19%
microFIT	Rooftop	> 10 kW ≤ 30 kW	0.713	0.60 to .63	-12 to -16%%
FIT	Rooftop	> 30 kW ≤ 150 kW	0.713	0.60 to .63	-15.4 to -15.8%
FIT	Rooftop	>150 kW ≤ 1 MW	0.713 to 0.635	0.53 to 0.55	-14.9 to -24.2%
microFIT	Ground Mounted	> 0 kW ≤ 10 kW	0.642	0.594	-7.5%
FIT	Ground Mounted	> 10 kW ≤ 1 MW	0.443	0.443	0%
FIT	Ground Mounted	> 1 MW ≤ 10 MW	0.443	Reduce by > 20%	Reduce by > 20%

Note: The recommendations in this report have been informed by a third party study of FIT pricing undertaken for CanSIA by Navigant Consulting Inc. (November 30, 2011) "Ontario Solar Pricing Update". The assumptions used to derive the recommendations for forecasted pricing are based on assumptions for all of the major project drivers including future inflation, interest rates, market forces, installation costs and on-going costs. A further discussion can be found in Appendix 3.

Price Degression:

Best practices for pricing degression ensures that prices are reduced not too dramatically, not too suddenly and not too frequently. The most important characteristic of FIT policy that has been demonstrated in jurisdictions worldwide is its ability to rapidly drive down the cost of solar energy. CanSIA supports a long-term vision for solar that includes targets and a long-term Price Degression mechanism to set a course for solar energy rates to trend downward. A degression mechanism addresses those issues upfront to ensure the process for awarding future contracts runs smoothly and efficiently.

Furthermore, a Price Degression model ensures efficiency for electricity customers. If the initial price is too high, those MW will be contracted quickly, and the price will fall automatically. As the market begins to compete for the contracts at the next pricing tranche level, it will be the highest quality projects, especially in terms of cost-competitiveness, that are first to apply for and receive contracts at the lower price tranche. Many of the other recommendations in this submission such as the criteria for evaluating applications support this model, so it remains extremely important that the recommendations throughout are taken holistically and not on a case by case basis.

CanSIA recommends to:

*f. Implement a **microFIT price degression** mechanism where the new rates are calculated through a review of the previous four months installation costs initiated each September 1 with new prices implemented the earlier of either i) January 1 or ii) the award of 200 MW of conditional offers within a given year.*

*g. Implement a **small-scale PV price degression** mechanism based on MW tranches. This would work by clearly establishing the number of MW targeted for each small-scale PV project category. Per category there should be a MW tranche allocated to a specific FIT rate. Once all the MW in the first tranche are contracted the FIT rate degression automatically shifts to the next MW tranche at the lower FIT rate. Again, once all the MW in the second tranche are contracted the FIT rate degression automatically shifts to the next, third MW tranche at an even lower FIT rate. This should continue to the point where grid parity is reached.*

Note: CanSIA supports a MW tranche Price Degression model for small-scale PV for the following reasons:

First, it provides transparency to the industry for the medium and long-term. This allows companies to plan effectively and make strategic decisions.

Second, by setting the schedule and shortening the development period, a mechanism is created that ensures the best projects are the ones that move forward. This ensures electricity consumers are getting the most for their money.

Third, it addresses the two core issues that have led to the slow down over the past year: price and capacity. This digression mechanism addresses those issues upfront to ensure the process for awarding future contracts runs smoothly and efficiently.

Finally, this model ensures efficiency for the electricity consumer. If the initial price is too high, those MW will be contracted quickly, and the price will fall automatically. As the market begins to compete for the contracts at the next pricing tranche level, it will be the highest quality projects, especially in terms of cost-competitiveness, that are first to apply for and receive contracts at the lower price tranche.

Furthermore, contracted MW that do not reach commercial operation should flow back into the program at the then current tranche. This process should start with contracted MW that are withdrawn flowing into the first pricing tranche to maintain the current level of developable solar projects in the market.

The degression schedule should also be created with the goal of having a growing small solar segment from program Re-Start through 2018, allowing the province to take further advantage of the falling costs over solar as the industry continues to mature in Ontario. One way to do ensure there is a growing market that delivers greater value to the rate payer is to structure the degression tiers so that as the price goes down, the number of MW awarded goes up. This is a structure that

CanSIA would endorse especially given the number of existing contracted projects available to support industry growth in the near future.

Furthermore, in order for a 'FIT Degression Schedule' to function optimally, the rules and process should be transparent and stable. Where degression is triggered by capacity targets, the OPA should maintain a clear and transparent database that allows applicants to monitor how many MW are left in a given tranche and the MW that are under review so that they can effectively gauge what FIT rate their application is likely to receive. The California Solar Initiative's "Trigger Tracker" offers a great example of this. For reference, the web address for this is http://csi-trigger.com/.

CanSIA recommends to:

h. *Implement a **large-scale PV price degression** mechanism based on timed degression. A time-based degression is likely more appropriate due to batched nature that contracts are usually awarded. FIT contracts of this size are likely going to be awarded less frequently due possibilities such as grid enhancement through the ECT process.*

3.4 Sustaining Ontario's Manufacturing Sector

Ontario's domestic solar equipment supply chain has developed significantly since 2009 with a considerable number of manufacturers establishing or expanding operations in the province or using Ontario–refined Silicon or components (See Table 1).

Table 1: Expected Module & Inverter Manufacturers in Ontario

Expected Module and Inverter Manufacturers in Ontario				
	Facility in ON	**Using 3rd Party Manufacturer**	**Using ON Silicon**	**Total**
Module Manufacturers	13-14	10 -11	2 - 3	25-28
Inverter Manufacturers	7 - 8	5 - 6	N/A	12 - 14

Domestically, these operations represent significant opportunities for job creation and investment in the near-term. On a global scale, Ontario's solar manufacturing sector has begun to report the export of Ontario-made solar equipment to the US and Europe. These opportunities will not continue unless the domestic market for Ontario-manufactured solar equipment becomes larger, more reliable and more predictable.

The priority recommendations in this section for sustaining Ontario's manufacturing sector present solutions that:

- Stimulate the Ontario market for Ontario-manufactured solar energy equipment so that operations mature, efficiencies are gained and assets can be depreciated to establish the ability of Ontario-manufactured equipment to become globally competitive.

- Introduce pricing stability, transparency and predictability to ensure investor confidence.

Market Scale, Distribution and Stability: Manufacturing operations with confidence in their ability to accurately predict long term market demand are best placed to make sustainable investment in their operations and in their labour force. In addition, steady market demand (as opposed to intermittent) provides manufacturers with the ability to optimize their operation intensity thus maximizing their job creation.

CanSIA recommends:

a. *Maximize existing and potential investment in Ontario's solar manufacturing sector by ensuring market demand is stable and of a suitable scale (as per the recommendation in Section 3.1).*

b. *Improve the level of information and pertaining to the FIT Program procurement process to provide greater transparency and market intelligence*.

Domestic Content: The 60 percent Domestic Content requirement as of January 1st 2011 for the FIT program has defined the manner in which investments have been made in the Ontario solar equipment supply chain.

CanSIA recommends:

c. *Ensure that the Domestic Content rules are implemented and enforced in a way that will continue to promote the sustainable advancement of Ontario's solar manufacturing industry and does not create any inherent unfairness in favour of any one manufacturing process over other processes being proposed to meet the Domestic Content requirements of the FIT Contract.*

d. *Introduce a process that pre-qualifies suppliers of equipment compliant with the Domestic Content provisions.*

3.5 Micro-Scale Market Sector (≤ 30 kW)

Note: For the purpose of this submission, the micro-scale solar photovoltaic market sector is defined as the solar photovoltaic market sector that serves residential and small commercial properties. Residential micro-scale systems are most commonly in the region of 0 ≤ 10 kW and can be 0 ≤ 30 kW on commercial properties.

The micro-scale (≤ 10 kW) market sector has experienced overwhelming demand and created significant productivity across the province. In two years, the microFIT program, has given rise to over 80MW of micro-scale projects that have reached commercial operation with a potential further 140MW currently within the application process.

The benefits to Ontario of the micro-scale solar sector are felt more broadly than any other solar sector. Micro-scale projects can be more universally distributed and the number of jobs created per MW is higher than for any other market sector. This market sector also fulfills a useful function for creating steady continuous market demand for Ontario-manufactured products.

Significant industry capacity has been developed in the micro-scale market sector with investment made in skills development, specialized equipment and tools and there exists significant market demand to ensure that this market segment continues to develop and create jobs and productivity. However, the microFIT sector remains unstable due to a number of significant unexpected disruptive changes experienced in during the program's first two years.

Amendments to the FIT Pricing Schedule, the introduction of a Price Degression mechanism and addressing issues related to connecting micro-scale solar to the grid (See Sections 3.2 and 3.3) will serve to tackle some of the key issues facing the sustainability of the micro-scale market: i) pricing that can be decreased having kick-started the micro-scale industry, and; ii) transparency into interconnection capacity availability and constraints for micro-scale systems across much of the province.

The priority recommendations in this section for the micro-scale solar market sector present solutions that:

- Affirm confidence within the micro-scale industry that disruptions and program instability of the microFIT Program will be avoided and mitigated against in future.
- Increase the accessibility of micro-scale solar technology to more Ontarians by stimulating new urban rooftop markets including small residential rooftops, small businesses and new buildings.

Confirm Targets for Procurement of Electricity from Micro-Scale Solar PV: There is currently great uncertainty within the micro-scale solar PV industry sector as to the amount of electricity that the Government of Ontario aims to procure through the microFIT:

CanSIA recommends:

a. *Set a target for an additional up to 200 MW of electricity to be procured from micro-scale PV annually to 2018 (accounted for from the Conservation targets in the LTEP).*

Reduce Program Instability: The CanSIA members involved in the micro-scale solar market sector have stated unequivocally that the retroactive implementation of new rules and pricing is the single largest contributing factor to uncertainty and instability in the micro-scale market. The announcement on October 31, 2011 - that microFIT applications would continue to be accepted and time-stamped but not processed until the new version of the Rules and Pricing Schedule are available - has led to a significant disruption for microFIT companies that tend toward smaller scale operations. The absence of a Pricing Schedule for microFIT has made it difficult to market microFIT systems during this period. In addition, the slow pace of contract releases has resulted in company's not having a project pipeline to enable them to maintain activity.

CanSIA recommends:

b. *Quickly establish a new Pricing Schedule for microFIT to allow the microFIT sector to continue to operate and to stabilize microFIT business activities and solar industry jobs thus creating near-term market activity for Ontario's manufacturing sector.*

c. *Avoid future program disruptions and instances where retroactive rules and pricing are implemented to protect Ontario's micro-scale solar businesses from upheaval and keep consumer uncertainty and market instability to a minimum.*

d. *Improve the transparency of the microFIT application process so that applicants can accurately track the progress of their application.*

Increase the Accessibility of Micro-Scale Solar Technology to More Ontarians: A number of potentially key market sectors for the adoption of micro-scale solar photovoltaics are not currently incented to adopt the technology. The project engineering development costs for small FIT projects between 10-30kW are too high and the requirements of the application process too onerous to be viewed viable projects currently. The cost per watt of installing a micro-scale system begins to drops significantly above 6 kW. For this reason, the economics of installing a micro-scale system on a small residential-scale rooftop are considerably less preferential than installing a system on a larger residential-scale rooftop. Single commercial property and business owners cannot participate. New buildings and homes cannot participate. The net effect of these restrictions is that a significant proportion of the province's rooftops are not incented to adopt solar photovoltaics.

CanSIA recommends:

e. *Redefine the micro-scale rooftop FIT tranches to i) ≤ 5 kW, ii) > 5 kW ≤ 10 kW and iii) >10 ≤ 30 kW (as per Recommendations in Section 3.3)*

f. *Increase the Eligible Participant Schedule to make microFIT accessible to single Commercial Property and Business Owners.*

g. *Incent new homes and buildings to adopt micro-scale solar photovoltaics.*

Increase Validity Period of Conditional Offer: The current microFIT rules allow for only 6 months in completing the installation and commissioning of a microFIT system from the date a Conditional Offer is issued. There are numerous issues that make this time frame inoperable. (The typical project flow is outlined in Appendix 4).

CanSIA recommends:

h. *Increase the validity of the Conditional Offer to 12 months window to be completed or a concession be made for systems that cannot reach this timeline. (The 6-month timeframe for installation of projects, but allow for one 6 month extension if required as long as the Offer To Connect (OTC) is valid i.e. if OTC has been paid for there should be one allowed extension at the original microFIT rate.)*

Relocation of Capacity Constrained Projects: CanSIA members are seeking further information on the Ministerial Directive issued August 19th 2011 with relation to the relocation of capacity constrained microFIT projects. CanSIA respectfully requests that further details be provided to those affected by this issue.

3.6 Small-Scale Market Sector (>30 kW ≤ 1 MW)

Note: For the purpose of this submission, the small-scale solar photovoltaic market sector is defined as that which provides power at 30 kW to 1,000 kW.

The small-scale (30 kW to 1,000 kW) solar market sector is an extremely important solar market for Ontario. The scale of individual projects are enough to achieve cost reductions while the suitability of commercial and industrial rooftops allows significant volumes of generation to be located close to urban loads. This eliminates the need for additional transmission infrastructure because small solar provides power at the load centre.

The majority of the 1,500 (approximate) FIT Contracts awarded by the OPA to date are Capacity Allocation Exempt (CAE) rooftop projects. Furthermore there are currently more than 4,500 Small Solar PV FIT applications sitting in the application queue. Various program and application process structural matters must be addressed to move the program forward with respect to both the existing contracts and the existing applications. CanSIA has put forth a strong and focused recommendation for managing the existing applications in queue as we believe it is the most important issue facing this segment today.

The recommendations outlined throughout this section are to be considered holistically and no one recommendation is meant to stand alone. Furthermore, the additional tranche, price and digression model recommendations are provided in Section 3.3. are also meant to supplement the suggestions stated below.

Short Term – Program Restart: CanSIA does not support grandfathering applications submitted between December 8, 2010 and October 31, 2011. CanSIA believes that this would endanger the long-term prospects of the Small Solar PV industry in Ontario, prompt ratepayer backlash and prolong the structural issues that have plagued the program to date. CanSIA does however strongly recommend that the existing applications be processed as quickly as possible under new guidelines.

CanSIA's recommendations throughout this section contain new criteria for the evaluation of applications that CanSIA believes will increase the quality of project applications and ensure that those projects with the greatest chance to succeed are awarded FIT contracts and connection capacity.

CanSIA Recommends:

a. *Existing applications currently in the queue be processed as quickly as possible under the FIT 2.0 program rules, as CanSIA has outlined below, to allow this industry segment to restart development operations.*

There is currently no strong alignment between the OPA in granting the FIT Contracts and the LDCs who validate and award connection capacity on the grid. This results in the awarding of contracts that cannot be connected, distorting the overall market size and frustrating developers.

CanSIA Recommends:

b. For existing applications, connection capacity should be one of the primary factors used in evaluating and awarding new contracts.

In line with the program changes the OPA made last December 8th, the processing of applications should begin with a preliminary assessment of available connection capacity. Projects that are located in areas where they cannot connect should be withdrawn from the queue before any new contracts are awarded.

CanSIA Recommends:

c. OPA should account for applications that have not been granted contracts because of capacity issues by creating a process for allocating any new capacity to previous applicants based on timestamp.

This means either including small-scale projects in the ECT or creating separate mirror structures specific to the small scale-solar segment. This should be supplemented by a transparent database that allows applicants to see where they are within the queue of FIT applications and the queue for connection capacity. Applicants who are denied a contract because of grid capacity issues should be allowed to maintain their place in line for future connection capacity as long as they are willing to maintain their first application security. If they do not want to participate in the ECT, then their security should be fully refunded.

CanSIA Recommends:

d. First Completion & Performance Security should be pulled forward and required at the time of application to reduce the number, and increase the quality, of applications.

This Security would then only be refundable if the application is rejected, withdrawn prior to review, or at COD as it currently stands. This should be applicable to all existing applications and all new applications going forward.

CanSIA recommends:

e. For the "Site Access" requirement, the OPA should require an executed lease or option to lease agreement for third party system owners. Letters of Intent and Memorandums of Understanding should no longer be accepted. Both the Option to Lease and the Lease should be evaluated based on the landlord's ability to cancel the project. Where this exists, an applicant should not be considered to have demonstrated site access.

These changes will ensure much more due-diligence is done upfront and that projects move quickly through the queue from contract offer to commercial operation. However, this is highly conditional upon the OPA making a firmer commitment to process applications within a 60 day period or less. If the OPA

cannot ensure processing within the specified 60 day period, then it would be unfair to require this security at application. CanSIA believes that the delays in the OPA processing were more a symptom of other structural flaws with the program, so this type of turnaround should be feasible going forward.

Once the pool is narrowed by the initial measure of connection capacity conducted by the OPA, the OPA should begin awarding contracts based on the new rules and rates according to the time stamp associated with each application. FIT applications should be evaluated in MW tranches corresponding to the size of each pricing tranche in the digression schedule (See Section 3.3).

CanSIA Recommends:

f. Existing applications in the queue notified of contract awards should have a 90 day period to meet the new requirements for site access and security, as outlined by CanSIA.

Once the OPA received the required materials, application processing should commence immediately. Applications that do not meet the criteria during this period should be withdrawn and would need to resubmit. Full refunds should be offered to any applicant whose application is rejected because they cannot meet the above criteria or elects not to accept the FIT Contract offer because of the new program rules and requirements. In addition, applicants would need time to ensure their ability to comply with the new program requirements, so during the Re-Start Period, it is important to have adequate time between milestones.

Currently the OPA has issued FIT Contracts to roughly 1,500 projects that would fall within the definition of the "Small Solar PV" category, the majority of which are CAE Rooftop projects. It is believed that many of these projects have a reached a dead end in the development process for a variety of reasons. However, developers have no incentive to terminate these contracts because they will then lose their security payments.

CanSIA Recommends:

g. Implement a one time, 60 day 'Off-Ramp' period to clear out the backlog of contracts.

This will provide a more realistic picture of how many projects will be built and ensure capacity is allocated to the best possible projects. During this period, FIT Contract holders should be allowed to terminate non-viable FIT Contracts and receive a full refund of their security payments. This period should commence 30-60 days prior to the Re-Start of the program. Any MW of small solar projects that are withdrawn during this period should flow back into the small solar program and increase the total MW awarded in the first pricing tranche

To illustrate the above mentioned process and timelines in greater detail we have included in Figure 1.

Figure 1: Small PV FIT Program Timeline and Process

Pre-Program Restart – Day 0

OPA applies connection capacity criteria to existing application queue. Applications for projects that cannot connect are removed and applicants are notified. Applicants have option to stay in line for ECT.

OPA publishes list of FIT Applications that pass connection criteria above listed in order of time stamp and with expected FIT based on position in queue and MW tranches.

Day 1

OPA posts final rules and FIT prices and prescribed form for applicants between Dec 8, 2010 and Oct 31, 2011.

Day 2 – Day 92

Applicants that are members of the first tranche have an option to either:

(a) Provide proof of site access and application security needed to meet new requirements. Also provide confirmation of system size, or;

(b) Remove their application from the list and receive refund of their application fee.

Day 2 – Day 92

OPA processes applications immediately upon receipt of updated proponent application. Contract offers should be made no later than 60 from date of submission of updated proponent application.

Day 92

Applicant deadline to provide evidence of site access and application security. Any applications not meeting this deadline are automatically withdrawn.

Day 93

Day 1 Process repeats. "X" MWs notified of contract offers equal to the number of MWs needed to fill first pricing tranche plus some surplus to account for expected attrition. Once first pricing tranche has been filled, processing begins on the subsequent pricing tranche(s).

Medium Term – Program Continuation: While the Short-Term recommendations are meant to capture program changes that would be implemented as part of the Re-Start program, there are other significant changes that should be introduced at that time and carried forward for all new applications. These changes are meant to create structures that will ensure the long-term viability of solar while addressing the root issues that have caused significant delays in the current program. They are also meant to ensure access to the FIT Program is enhanced and to open the door to new participants.

Note: The subsequent recommendations rest upon the belief that it is possible to create a process where all parties are capable of meeting the timelines set out in the program to ensure projects move through the development process as efficiently as possible. If there continue to be substantial delays in the processing

of projects by either the OPA or the LDCs, then many of the subsequent recommendations would need to be significantly revised.

CanSIA Recommends:

h. The OPA should strengthen the current "Pre-FIT" consultation process and shift the burden to applicants. Applicants should be required to obtain a letter from the applicable LDC and/or Hydro One confirming capacity exists at the location where they will be connecting.

Projects would then be processed normally through the OPA process. Grid capacity would continue to be officially allocated through the existing CIA process post FIT Contract award.

The ideal long-term solution would be to move CIA approval to the front of the application process and make it a requirement for submitting a FIT Contract. Capacity award would then require a FIT application to be submitted within thirty days of the proposed capacity award in order for the project to maintain its guarantee of capacity. If proof of a FIT application is not submitted, then the capacity would then be made available to the next project in line. However, this would require the OEB to make changes to the distribution system code. Since this would likely be a lengthy process that would delay the review, CanSIA recommends that this not be undertaken at this time but be considered in the future.

CanSIA Recommends:

i. Ensure all new applications are processed in accordance with the 60 day timeline outlined in the Program Rules.

j. Ensure applications are awarded on a rolling basis rather than large pools of contract releases at set times.

This will ensure a steady stream of projects and avoid unnecessary administrative delays for developers. Taken in tandem with the pricing recommendations and set pricing digression based on awarded contract capacity (See Section 3.3) CanSIA sees no reason why there would be any need to continue to release contracts in large batches rather than on an ongoing basis as prescribed by the 60 day review process.

CanSIA Recommends:

k. Reduce the current requirement for MCOD from 3 years to 18 months for projects that do not require an REA.

The current requirement for MCOD that do not require an REA is too long. The recommended 18 month period should commence at contract acceptance. The "tail" following the required MCOD should be reduced from eighteen months to three months, during which time contract holders can pay the liquidated damages to preserve their contract. Contracts that do not reach commercial operation within these time frames should be terminated without the return of securities. There should be no further granting of

extensions by the OPA, and contract holders should invoke the Force Majeure provisions of the contract where necessary because of significant delays beyond their control. This includes delays by the LDCs in processing CIA applications which should be honored as legitimate Force Majeure claims if proper proof is provided by a contract holder.

CanSIA Recommends:

l. The milestone of Notice to Proceed should be removed from the process for all rooftop projects. Contracts offered for projects in this range should be deemed to be automatic NTP facilities thereby removing the OPA's right to terminate upfront.

The Notice to Proceed milestone creates an unnecessary administration burden for developers and the OPA. With NTP removed from the process, the second application and completion security should then be due at the point of contract acceptance. The OPA should still allow developers the opportunity to have their domestic content plans reviewed in advance, but this should no longer be a requirement. For all ground mount projects falling within the small solar class, NTP and REA should continue to be a mandatory part of the process.

CanSIA Recommends:

m. *Relocation of the FIT Contract and Facility should be allowed under the FIT Contract after a project has reached commercial operation*.

The criteria for relocation should be adequate connection capacity and the capacity to support the existing Facility. The OPA should also clarify what specific monetary liability, if any, the FIT contract holder is responsible for if the FIT Contract is terminated prior to the end of the twenty year term. The twenty year term of the FIT Contract creates many challenges for building owners as they look to predict possible changes in their business over that term. By giving them the ability to relocate systems if necessary, the contract becomes less flexible and solar becomes a more viable option for a wider group of participants. At the same time, because of the costs associated with relocation, the OPA can be sure that this right will only be used as a measure of last resort.

CanSIA Recommends:

n. The OPA and the OEB should develop a structure that will allow projects to connect in-series if in-parallel interconnections cannot be accomplished at low voltage.

The first step is eliminating this restriction within the FIT Program and allowing LDCs to interconnect in-series. Allowing in-series interconnection is very important because there are many potential project sites that are metered at high-voltage. The additional cost of the equipment necessary to interconnect at these high voltages often prevents the projects from going forward.

3.7 Large-Scale Market Sector (≥1 MW)

Note: For the purpose of this submission, the large-scale solar photovoltaic market sector is defined as being ground-mounted facilities 1 MW ≤ 10 MW.

The large-scale ground-mount solar market sector is an important market sector for Ontario as it has and will continue to create significant economies-of-scale and predictability for the province's solar supply chain and manufacturers, increases the accuracy of long-term planning and provides the lowest-cost solar electricity to the province's customers. In fact, Ontario has the majority of North America's operating utility-scale solar power systems.

However, the utility-scale solar power sector faces significant challenges and delays. The applications and regulatory process for utility-scale FIT projects are extremely slow with no applications for utility-scale solar projects being processed since June 2010 and few large ground-mount solar FIT project receiving an REA to date (18 months after FIT contract award). In addition, details of the required grid upgrades to facilitate the distribution of the power generated are not transparent to solar developers and their investors (the initial economic connection test (ECT) to identify where justifiable grid updates will be invested in has not yet occurred).

Currently, there is approximately 3,400 MW of ground-mount solar PV awaiting application review and the Transmission Availability Test (TAT) and the Distribution Availability Test (DAT) results. As well, there is approximately 1,600 MW of large ground-mount applications awaiting Economic Connection Test (ECT) and approximately 890 MW of FIT contracted projects going through the Renewable Energy Approval (REA) process – a process that was established with a guaranteed review time of 6 months, but in reality is taking much longer.

This is creating a situation where investment decisions are being placed in severe jeopardy as a result of a slow and cumbersome approvals process.

The priority recommendations in this section for the large-scale solar market sector are presented to offer solutions that:

- Streamline the Renewable Energy Approval (REA) process and align it with the timing of the FIT contract to allow projects to be developed.

- The governing authorities (i.e., the Ontario Power Authority and the Ministry of Energy) to rigorously follow transparent and consistent processes such that FIT applications work through the program in a timely manner. This would force projects in the queue to expediently reach business decision points that either results in construction and job creation or the natural attrition of non-committal projects thus freeing up scarce grid capacity.

  Key activities that would support this principle include:

- Proceed with the long-planned first ECT process to identify new viable projects and economic grid upgrades.

- Review applications and award contracts on a continuous basis (e.g. do not offer contracts in large batches because this burdens the REA and interconnection processes, as well as disrupts manufacturing/supply chain forecasting).

- Facilitate the interconnection process with local distribution companies (LDCs), e.g., Hydro One's Connection Impact Assessment (CIA), interconnection cost estimates and Connection Cost Agreement (CCA) processes, as these processes are not lining up with the rest of the processes within the project development phase.

- Provide up to date grid capacity and contracted project mapping (monthly) so that developers can make sound investment decisions and focus new project development activity in areas of need. Additionally, lists of projects in the application queue should also be published and updated monthly.

FIT Application Process:

CanSIA Recommends:

- Memorandums of Understanding and Letters of Intent should no longer be accepted as reasonable proof of Site Access, with the possible exception of projects with First Nation participation.

- Current fees and security amounts are deemed to be fair.

- Application processing timelines should be more codified and adhered to, and more transparency provided to an applicant on where their application is in the process.

- Running the TAT/DAT process, awarding contracts or moving projects into the ECT process on a continuous basis as opposed to large batches will eliminate bottlenecks and allow for better resource utilization of everyone involved in the program (OPA, LDCs, MOE, MNR, MTC, etc.).

Class 1, 2, 3 Agricultural Land Limitations

Principle – CanSIA welcomes a productive dialogue concerning the impacts and merits of the use of agricultural land for solar projects. On the basis of environmental impacts, net area energy yield, value creation and job creation, we believe that solar PV compares favourably to conventional agriculture.

Practice – Agricultural land class limitations have created an unintended cost impact to solar projects which make it more expensive to build. This makes it challenging for the industry to support deeper cuts in the FIT price without reconsidering the land class limitations. As a minimum, the FIT rules should be amended to help reduce the "patchwork" effect created by isolated pockets of class 1, 2 and 3 land on sites that are predominantly composed of poorer soil classes.

Class 1, 2, 3 lands are not evenly distributed on lots. As a result, projects have been awarded on sites with major portions of Class 4–7 land, but with small isolated segments of class 1, 2 or 3 soils. Often times these

pockets of Class 1, 2, 3 soils were never farmed as Class 1,2,3 land due to the fact that the majority of the land parcel was a different class. The current FIT rules forbid construction on these isolated segments, and therefore, this results in disjointed and inefficient plant design which adds cost to design, engineering and construction of a project. Furthermore, these small portions of class 1, 2, 3 lands become "stranded" by a solar project design such that the continued farming of these pieces is not practical or achievable, which defeats the original intent of the agricultural land restrictions.

Furthermore, Class 4 and higher land, due to the lack of disturbances from the lack of farming activity, actually holds more habitat value for endangered species, migratory birds, habitat connectivity value and other environmental considerations. This results in further inefficient designs (and costs associated), more land required and mitigation costs to ensure the environmental attributes are protected.

CanSIA Recommends:

- Removal of the Class 1, 2, 3 limitations, noting that no other development in the province has such a limitation (e.g., subdivisions, landfills, warehouses). Eliminating the restriction would:
    - Allow projects to be built with reduced structural/foundation costs, which would allow for further FIT price reductions and reduced ratepayer impacts.
    - Result in fewer projects being located in environmentally sensitive locations.

Projects have been awarded on properties with partial land class restrictions. This results in disjointed project layouts with increased costs. Awarded projects should be allowed to build on the entirety of their subject property and the effects of various impacts (e.g., environmental, archaeological, agricultural, community) should be evaluated holistically through the REA.

10 Megawatt Cap

CanSIA would like more clarity on how this cap was originally set and the rationale behind the decision.

Multiple Projects on One Property

CanSIA would like more clarity on the treatment of multiple projects on one property. For example, CanSIA believes that a 5 MW project under FIT 2.0 should be allowed on the same property as another 5 MW project that was previously contracted under FIT1.0.

ECT Process: Conducting the first ECT will push applicants to decision points where some projects will fall off leaving room for other projects. This will in turn provide the Government with a more accurate picture of where grid upgrades in support of distributed generation should be planned. The ECT process should be run as it was intended on a regular basis so everyone involved in the program has up to date information and can make timely business decisions.

This will also enable the province to identify grid infrastructure requirements and recommend renewable energy improvements and enabler facilities. These improvements will not only support renewable energy by increasing capacity but also create an added benefit to the aging Ontario grid by adding modern transformers, facilitating smart grid integration and adding to grid stability.

Step 1: IPA for Phase 1 &2 by February 2012

Step 2: ECT Phase 1&2 by March 2012

Step 3: TAT/DAT all applications submitted prior to October 31, 2011 by May 2012

Step 4: Run ECT again by October 2012

The ECT should also allow input from proponents during the process that could improve the results such allowing developers to fund some of the transmission upgrades.

Interconnection: The current interconnection timelines do not coincide well with the FIT timelines and the Distribution System code needs to be amended to accommodate FIT timelines and provide more protection for generators.

CanSIA Recommends:

- Allocated grid capacity should not be removed after 6 months of receiving a Connection Impact Assessment if the generator has requested a Class A cost estimate for upgrade costs and is waiting on such class A to make business decisions. The current scenario only allows enough time for a Class C estimate (which is a +/- 50% estimate) before being forced to execute a Connection Cost Agreement.
- Additional connection allocation time (e.g., one month) should be provided for:
    - Every Class C cost estimate revision that is provided by an LDC through no action by a proponent, and
    - Cases where the final interconnection cost estimate amounts in the Connection Cost Agreement are different than previous Class C estimates provided to a proponent.
- The 6-month connection allocation limit should be extended to 1 year to better align with the 3-year project development period. Currently, proponents must pay interconnection cost estimates very early in the development period. Also, upon payment, an LDC will commence the interconnection work even if it is not required for another year or two. Alternatively, the deposit will sit in an LDC's bank account for an extended period of time for no other purpose than a Code requirement.
- Incentives should be added to the Distribution System Code, Transmission System Code and other associated legislation so that the LDCs that are able to find costs savings have incentive to do so. It is common for non-LDC work quotes to often be 25–50% less expensive than the LDC costs. This is money that could be used to improve the system and reduce rate payer impacts. This should not be limited to simply works associated with connecting renewable.
- The Distribution System Code should ensure that executed CCAs include a commitment to connect within a reasonable amount of time and that failure to achieve those dates include penalties payable to the Generators as they in turn are subject to penalties to the OPA.

- All LDCs should be committed to providing up to date system information through the OPA so that the transparency of the grid capacity available is improved and TAT/DAT and ECT can be run more efficiently. This will assist in properly siting projects and ensuring that business decisions can be made for projects in the application stage.

The FIT Contract:

CanSIA has reviewed the security requirements and has determined that the security requirements are reasonable. However, CanSIA recommends that the OPA allow the contract holder to pay the 2nd completion and performance security at any time prior to NTP. This would give contract holders the option and ability to access financing and start construction immediately after the OPA issues NTP. Presently, contract holders need to wait until after NTP to provide the completion and performance security and lenders require the OPA to confirm receipt of NTP payment, which adds time to the development process.

NTP termination clause 2.4 (a) should be removed as it has already created some uncertainty in the industry. The industry is committed to a contract at award and this clause limits the industry's ability to ensure a strong investment and limits its ability to finance projects.

With respect to NTP requirements, the requirements should simply be a CCA from the LDC and an REA. This would be much easier for the OPA to review and administer. If a proponent is requesting NTP, they would already have secured financing to proceed to construction. An additional financing plan review by the OPA at this stage is irrelevant. Furthermore, FIT contract holders should have the option, but not the requirement, of requesting the OPA review and provide feedback on a project's domestic content plan. The OPA's auditing right already provides the necessary requirement for project financiers to ensure domestic content compliance. Similarly the form of Domestic Content "comfort" letters should be posted and circumstances a generator can request these should outlined in the FIT contract.

CanSIA understands that there has been some discussion regarding the relocation of projects and amendments to lands under the contract. Due to the significant impacts to project layouts and design that occurs through the REA and consultation process, it is critical for the success of this program to allow for land modifications to ensure that projects can meet and address concerns raised through the permitting process. CanSIA recommends that the OPA, the ministry and CanSIA work towards finding a reasonable approach to creating a policy for amending lands associated with a project.

Similar to the former RESOP situation, FIT Contract holders should be allowed to apply for an OEB generation license at any time, with the condition that the facility should be in-service within 2 years of the receipt of the License. Currently, an applicant cannot apply until after receiving their NTP notice from the OPA. Furthermore, a generation license is required to execute an LDC connection agreement. The cumulative timeframes of these processes push connection approvals very close to construction completion with the added risk of having unnecessary delays between project completion and interconnection/commercial operation.

With respect to commercial operation requirements, the Working Group recommends that the FIT program implement a RESOP-style self-declaration. The FIT commercial operation conditions unnecessarily double-

check processes already covered by other agencies, such as the Electrical Safety Authority and the LDC (e.g., single line drawing and metering plans).

Finally, an amendment should be added to subsection 1.5(a) of Exhibit B such that there will be compensation for any economic curtailment (the current contract is too uncertain for many lenders). Additionally, subsection 11.1(b) of the contract should be changed by adding the following at the end of the first sentence: "or under common Control with the Supplier". This will more easily allow portfolio financings which will increase liquidity for FIT projects and reduce the debt costs which will ultimately benefit ratepayers.

FIT Pricing and Procurement: CanSIA continues to explore the FIT price and a degression model for Large Solar PV. This is being done in conjunction with the other CanSIA working groups to ensure a resilient and stable market exists for all participants and sizes.

A stable market is the best scenario for all stakeholders involved:

- Panel suppliers can forecast and amortize their investments confidently over many years driving down costs and overcoming the cost differential between Ontario made panels and those of other markets.

- Developers can forecast and further invest in future projects with confidence, hire staff and continue to create high quality jobs in construction, engineering, project management, financing, sales and more.

- Allows for investment into research and development because there is a long term market for innovative technologies.

For ground mount pricing, the working group recommends that a reduction in FIT price from the current levels by at least 20 percent of its current level for large scale ground-mount projects to be built in 2014. The Working Group would like to refer to the Navigant Price Study (included in Appendix 3). Certain judgment needs to be applied to these results, for example, the Working Group are concerned that the financing and debt assumptions used in the derivation of the FIT price may be overly optimistic given the current global financial situation.

There are several considerations that need to be considered when coming to a price and some are related to items within the FIT program and others are outside factors that are tough to predict such as interest rates and domestic content panel pricing.

CanSIA also recommends that the best method for balancing ratepayer impact and ensuring the stability of the market is to have a well-defined degression model. This will ensure that there is continuous innovation to drive down prices towards grid parity while allowing business to have a clear look at future pricing so business decisions can get made. This will also ensure the rate payer sees a maximum cap to the expenditure on solar and a clear commitment that the solar industry is pushing towards grid parity in a timely fashion. CanSIA hopes that through this review process we can work with government to find the right price and digression model that ensures a stable and cost effective market. To this end CanSIA encourages the Ministry to share its modeling assumptions so they can be discussed with us when

compared to our inputs in the attached chart. CanSIA also feels that for discussion it is important that the reasonable rate of return is kept at 11% levered due to;

- Production input or irradiation is based on a 50% probability and as a result should carry a slightly more resilient rate of return when compared to traditional or other renewable sources that utilize 90+% probability values when evaluating their resource.

- Financiers requirements for coverage demand a higher rate of return to ensure proper coverage, if the ROI assumption is reduced the Debt to equity ratio assumption and cost of debt would also change making projects essentially more expensive

- Because projects under 10MW are essentially small to mid-scale when compared to other infrastructure investments it needs to have a favorable return to ensure investment capital

Some additional consideration should be given to the promotion of new technologies by having the Government providing additional series of price adders. For example, the FIT program should have a price adder for storage capability. This would promote consistent or on-demand power to the grid. Furthermore, a separate price adder should be considered to promote solar installations on brownfield or reclaimed land. The adoption of a modest Brownfield FIT Tariff Price Adder to increase the revenue generation from ground mount solar systems installed on these properties would provide the increased revenue needed to stimulate investment in Brownfield renewable energy development.

Renewable Energy Approval Process: CanSIA strongly supports the goals of the REA process. However, we believe that the administration and interpretation of the regulations is hindering its effectiveness.

The REA process takes 18–24 months to complete. This is far longer that than the commensurate approval timelines for projects with similar (or greater) environmental impacts (e.g., a warehouse). If the REA process timelines are not reduced it will have serious implications on the Milestone Date for Commercial Operation. This not only adds uncertainty and costs to developers but to manufacturers as well. If projects are taking longer than 3 years due to REA timelines, manufacturers that came to Ontario at the onset of the program are now left with idle plants or materials stockpiles that may lead to downsizing-- or worse, complete closures.

The Government should work with CanSIA to reduce the REA timelines including proponent studies and agency approvals to no more than 12 months. CanSIA feels that one of the easiest ways to accomplish this is to allow components that currently are being asked for into the REA that can be stamped and sealed by professionals to be removed, as studies required or requested for a complete submission. Proponents can now commit to minimum standard within the REA submission and the REA becomes conditional on providing Stamped and sealed plans or stamped professional letters prior to construction start. This allows for the design to evolve as it is expected to through the REA and consultation process, allows for greater incorporation of municipal and public comment, ensures that the protections sought are still maintained while minimizing the need for Costly redesigns and delays in the process waiting for these re designs. This also reduces resource constraints in the Ministries in having to review and approve items typically dealt with through professional associations and their codes of conduct such as;

- Stormwater

- Noise
- Reasonableness of setbacks as asserted by a biologist or hydrogeologist

CanSIA also suggests the following be incorporated into the REA:

- Allow for consideration of the positive environmental benefits of solar energy in the REA process. For example: Consideration for displaced carbon and considering habitat value between rows and under panels.
- Create an REA process for solar PV that is commensurate with its low impacts rather than including it in a "one-size-fits-all" process for all renewable energy projects, including those with much wider effects.
- Create a more streamlined process for smaller ground mount projects, (≤ 500-kW projects or less than 3 hectares). This allows the MOE and other Ministries to focus resources on the more complicated projects.
- Non legislated targets, such as the time it to takes be deemed complete application, should be minimized and targets communicated to the industry need to be met (such as 40 days to be deemed complete or comments provided).
- Allow for conditional or partial approvals to ensure some comments from regulatory bodies can be addressed appropriately. For example a partial approval for site preparation and tree removal where the MNR has requested it be conducted outside nesting seasons. This will prevent having to wait 6 months to a year before construction can start after the REA is approved due to timing of that approval. This will prevent delays and Force majeure requests to accommodate conditions within the approval.
- Allow for more flexibility within the approval process for design changes that do not alter the impacts of a project.
- As part of the FIT Review process, the Government should consider CanSIA's previous submissions on the REA process as well as the existing CanSIA/MOE/MNR/MTC working group activities (Please find accompanying documents to this submission).
- Water body should be part of the NHA submission, as it is often included in that study and having it re-reviewed by MOE seems to be duplicating work
- Consultation plan reports should be accepted on their face, that the proponent has properly consulted with the stakeholders indicated and properly documented those consultations. The MOE should not be wasting resources reaching out to every stakeholder to confirm that they have been properly consulted with. The EBR posting 30 day period to receive comments should allow for Stakeholders to voice whether they have been properly represented in the documents. As well this is a risk the developer should bear, if they haven't consulted properly their REA will be declined and they will have to re conduct the consultations.

Municipal Consultation: CanSIA fully supports a more resilient and engaged process with municipalities. Often our members go above and beyond the requirements under the REA program by having direct deputations to council or other meetings with municipalities to ensure they are engaged and informed in the process. We would encourage the addition of this as a formal process within the REA provided it occurs within the current timelines.

Other than our above suggestion CanSIA does not feel adequately educated as to the nature of the concerns of municipalities to provide more appropriate feedback within this FIT review at this time. CanSIA proposes further discussion between CanSIA, the municipalities and the Ministry to clarify the challenges and identify solutions. CanSIA would encourage that such an engagement be structured to ensure that the industries concerns are also addressed within this forum such as:

- Ensuring that there is not additional time constraints added to the FIT process due to any additional municipal consultation efforts.
- Any fees requested by municipalities are reasonable and are considered when FIT Pricing is set as no fees have been assumed in any of the FIT pricing models CanSIA has reviewed.
- Ensure that Solar is considered as a distinct group within renewables as it is limited to small areas and is typically on privately owned parcels of land.
- That solutions do not create a second approval process that will further add risk and uncertainty to projects and further project delays.

3.8 New Technologies

The GEGEA and FIT Program have been strong drivers of technological innovation for a number of solar PV technologies in Ontario, including photovoltaic modules and inverters. By creating a strong policy environment to support the development and innovation of new solar products, Ontario is now at the forefront of solar PV progress worldwide.

The Ontario Government can build upon this initial success by expanding the FIT Program to include new technologies in solar energy. By catalyzing and deploying new cutting-edge solar technologies, Ontario can strengthen its position as a hub of green technological innovation and development, while expanding valuable export opportunities.

3.8.1 Solar Thermal

CanSIA would like to see the current FIT Program model be expanded to include mechanisms to support solar thermal (ST) technologies. CanSIA is confident that a market transformation is achievable for ST technologies, similar to what is occurring on the PV side of the Industry. In order to facilitate a transition towards an ST FIT Program CanSIA believes that a two-phased approach is optimal to provide the necessary time to roll out longer-term technical, administrative and pricing details required to structure an ST FIT Program, while still providing incentives in the immediate term to keep the solar thermal industry moving forward. Furthermore, it will allow the Ministry of Energy and the OPA the opportunity to complete the FIT Program Review in the short term, and subsequently transition the necessary resources to the solar thermal portfolio to develop a solar thermal FIT Program over the course of the next 6 to 24 months.

CanSIA recommends:

a. *Introduce a two-phased approach to implement performance-based incentives for solar heating.*

Phase One (Timeframe: Present – 24 months):

CanSIA recommends:

b. *Re-create an immediate upfront performance-based incentive for solar air and solar water heating systems based on projected energy savings, using an accredited and established modeling tool such as RETScreen®.*

This would take the form of ¢/kWh (t) or $/GJ of projected energy saved, based on validated and established modeling tools such as RETScreen®. The performance-based incentives options for Phase One could be structured in three possible ways, as outlined below:

(1) ¢/kWh $_{(t)}$

Advantages: This option mimics the current performance-based structure with the electrical FIT in terms of paying a certain number of cents per kWh (Thermal).

(2) $/GJ

Advantages: This option is effectively the same as option one, however the renewable energy production is expressed in gigajoules (GJ) instead of kWh.

Note: This is similar to the Gaz Metro Model in Quebec where the natural gas utility Gaz Metro has a performance incentive in place in which they pay a capital incentive for solar air and water heating that equates to $3/cubic meter of natural gas displaced. This projected renewable production is based on modeling done for each project in RETScreen or SWIFT (modeling tools developed by Natural Resources Canada). The advantages of this model is that it establishes a uniform price for renewable energy generation and ties the program objectives to the amount of energy produced (or conventional energy displaced) for one year of savings.

(3) $/$m^2$ of collector

Advantages: This would be consistent with past Ontario ST incentive structures. The administration would be minimal here as it would just re-introduce a program that has already worked efficiently at the Ministry of Energy. It could potentially be operated through the OPA *Save ON Energy Program* which pays a certain dollar amount per square meter of collector. Currently, this program only supports commercial solar hot water systems that displace electricity, but the scope could easily be expanded to include both solar water and solar air systems that displace natural gas (or propane or electricity) in any type of commercial, industrial, residential or agricultural application.

Phase one is necessary because currently there are no established product standards for metering solar thermal systems, neither solar water nor solar air. A plan to develop a standard to meter solar heat energy from both water and air systems would have to be implemented, potentially in conjunction with Weights & Measures Canada. Further, there are applications, such as solar air systems on agricultural buildings, where a different approach might be required because conventional metering would be a challenge. To these points, it would be important for industry, utilities and governments to resolve these technical issued prior to implementing an ST FIT Program. This is why the industry and government need time to resolve these important technical issues.

Phase one should be relatively straightforward to implement and it builds upon the success of the former OSTHI program in Ontario. The re-instatement of an incentive mechanism for solar heating systems will ensure that the strong domestic base that was created in Ontario over the past 4 years is maintained and that the solar thermal industry continues to create new jobs. A continuing lack of support poses a major

risk factor to the Ontario solar thermal industry. CanSIA estimates that a minimum of $4 million to $6 million per year (thus comparable to the past funding for OSTHI) would be sufficient to incentivize the Ontario solar thermal industry to continue growing at similar rates as in 2010 leading up to the introduction of an ST FIT Program.

CanSIA recommends:

c. *Develop a Solar Thermal FIT Program action plan over the course of the next 6 to 24 months to determine the next steps required to implement such a program.*

This initiative would require examining administrative, regulatory and pricing matters that would need to be addressed to create and launch an ST FIT Program. CanSIA suggests engaging the natural gas utilities in the province to see if their current demand-side management programs could be expanded to include more meaningful support of solar thermal technologies.

CanSIA recommends:

d. *Continue the "Green Ontario's Provincial Buildings" incentive program.*

Currently the Provincial government is funding renewable energy projects on schools and public housing buildings. CanSIA applauds this initiative and recommends that it become the cornerstone of a comprehensive policy designed to ensure that all provincial buildings can access funding to upgrade their buildings to include on-site renewable energy.

Phase 2 (Timeframe: 24 months onwards):

CanSIA recommends:

e. *Launch a Solar Thermal FIT Program in approximately 2 years.*

This incentive framework would consist of a prescribed ¢/kWh (t) or $/GJ rate for solar air and solar water systems, structured similar to the solar PV FIT Program. This would create the basis for widespread solar heating in the province. Since solar heating systems have very higher energy production and lower capital costs per square meter CanSIA estimates that a shorter contract life, spanning from only one year to ten years, would be sufficient.

Solar Thermal Pricing

Establishing an appropriate pricing schedule for solar heating systems is something that would be undertaken during phase one (See recommendations above). To provide a context of the pricing range that has historically been sufficient at stimulating market demand in Ontario from 2007 to 2010, CanSIA has converted the incentive pricing from the OSTHI program (which paid a one-time upfront incentive of $\$70/m^2$ for solar air systems and $\$275/m^2$ for solar water systems) into the current FIT pricing framework.

Note: The OSTHI program matched the federal ecoENERGY for Renewable Heat Program.

Figure 2: Solar Thermal Price Estimates

	Solar Water Heating	**Solar Air Heating**
OSTHI Incentive	$\$275/m^2$	$\$70/m^2$
Federal Incentive	$\$275/m^2$	$\$70/m^2$
Total Incentive in Ontario for Solar thermal systems	$\$ 550/m^2$	$\$140/m^2$
Average Annual Energy Production per square meter	600 kWh_{th}/m^2	500 kWh_{th}/m^2
Total Incentive per kW_{th} (one-time incentive)	$\$0.78/kWh_{th}$	$\$0.28/kWh_{th}$
Annual cost over 5 year term	$\$0.156/kWh_{th}$	$\$0.056/kWh_{th}$
Annual cost over 10 year term	$\$0.078/kWh_{th}$	$\$0.028/kWh_{th}$
Annual cost over 20 year term (Current FIT Program contract timeframe)	$\$0.039/kWh_{th}$	$\$0.014/kWh_{th}$

Based on these numbers, the financial viability of investing solar thermal technologies is clearly evident and could provide tremendous value to Ontarians. CanSIA believes that a performance-based solar thermal incentive will be a positive step to achieving market transformation.

Additional Options for Consideration

In addition to the two-phased approach detailed above, CanSIA also reiterates that it is worthwhile to consider an on-site renewable energy generation target in the building code for the next revision of the Ontario Building Code. Mandating 10 percent on-site energy generation would guarantee that all new commercial and industrial buildings in Ontario draw some of their energy from renewable sources, while requiring no direct government or ratepayer incentives.

These pragmatic policy recommendations were developed to ensure that the solar thermal industry will be able to deliver increasing benefits to the province in the form of clean heat energy, improved air quality, and the creation of new high-value employment based on robust domestic and export growth. Creating an environment where ST technologies are able to have broad uptake throughout the entire building sector will help Ontario to reach their impressive renewable energy and conservation targets while minimizing costs to the government.

3.8.2 Concentrated Photovoltaic Technology

By catalyzing and deploying new cutting-edge solar technologies, Ontario can strengthen its position as a hub of green technological innovation and development, while expanding valuable export opportunities. Concentrated Photovoltaics (CPV) technology is currently excluded from the FIT Program and hinders Ontario's ability to foster innovation in this area.

CanSIA recommends:

a. *Expand the FIT Program to include Concentrated Photovoltaic (CPV) technology.*

3.8.3 Building Integrated Photovoltaics

Building-integrated photovoltaic (BIPV) are technologies and/or materials that are used to replace building materials needed for roofs, skylights, facades, curtain-wall on high risers, parking canopies, among other. BIPV is currently excluded from the FIT Program and hinders Ontario's ability to foster innovation in this area.

CanSIA recommends:

a. *Expand the FIT Program to include Building Integrated Photovoltaics (BIPV) technology.*

3.8.4 Parking Canopies

The potential of solar PV energy includes the utilization of otherwise useless space, as well as integrating distribution near demand.

CanSIA recommends:

a. *Provide FIT Program rate adders to stimulate the use of solar PV on parking canopies*.

4. Conclusion

The Province of Ontario has developed the foundation required to establish the province as a global renewable energy leader. To follow through on this early success the Ontario Government must remain committed to solar energy to create a cleaner environment and generate green economy jobs for generations to come.

The outcomes of this FIT Program review will determine the path forward for the Ontario solar industry and the role it will have on the international stage.

To ensure the long-term sustainability of the Ontario solar energy, including solar manufacturing, an annual market size of ≥ 500 MW is required. By procuring approximately 4,660 MW under the LTEP generation portion (e.g. small and large PV) and an additional up to 200 MW per year to 2018 under the LTEP conservation portion (e.g. micro-scale PV), the Ontario solar manufacturing industry will have the annual MW market size required in the province to be sustainable and compete on the global stage.

By achieving these solar PV targets in Ontario, the solar industry is estimated to create an average annual 17,000 solar energy jobs in the province. Solar PV provides peak shaving capacity during the day, when electricity demand in Ontario is at its greatest and electricity costs are at their highest. Going forward solar will continue to decline in cost as the benefits of solar continue to increase over time. As Ontario's energy policy successfully drives down the cost of solar energy year-on-year, Ontario will benefit from the supply of competitively-priced modern clean energy.

CanSIA hopes that this submission is viewed as factual, constructive and collaborative. CanSIA appreciates this opportunity to provide feedback as part of the Ministry of Energy FIT Program Review consultation. CanSIA welcomes the opportunity to discuss the recommendations and points discussed throughout this submission in greater detail with the Ministry as the design of the FIT Program continues to take place.

Appendix 1: CanSIA FIT Review Process

The CanSIA FIT Review Consultation Process is a factual, constructive and collaborative way for CanSIA members to make their voice heard and provide input to the Ministry of Energy. The Ministry reached out directly to CanSIA, as the trusted and credible voice of the solar industry, in order to ensure that the solar industry is best heard and its views represented and considered during this Review.

On October 31, 2011 the Ontario Ministry of Energy officially launched the FIT Program Review. The Ministry has indicated its interest in receiving input on a variety of topics, including tariff amounts, manufacturing retention and growth, new technologies, local input, and the Renewable Energy Approvals process.

In anticipation of this FIT Program Review, in October 2011 CanSIA established FIT Review Working Groups to provide all members with an opportunity to have their voice heard and get engaged in this process (See below). The Working Groups consist of the following:

- Micro-Scale (≤ 10 kW).
- Small PV (≤ 500 kW).
- Large PV (e.g. Utility Scale).
- Solar Thermal.
- Manufacturers Working Group.
- Technical Working Group.

The end goal is to have a very comprehensive FIT Program Review Final Submission created by CanSIA and its members that provides the Ministry of Energy and the Ontario Power Authority with factual and constructive FIT Program considerations and recommendations. The 'Principles' that CanSIA is abided by during his process are listed below:

- Maintain a stable and sustainable solar industry that meets customer and stakeholder expectations.
- Establish prices that earn a fair return for industry members, while accelerating grid parity.
- Enhance opportunities for Ontario job creation and community economic development.
- Honour investments made, or to be made, by industry based on contracted agreements.
- Foster manufacturing, encourage innovation and commercialize viable solar energy technologies.
- Accommodate multiple business models, sizes and scales within the Ontario market place.

Appendix 2: Ontario's Long Term Energy Plan, Setting Targets

Break Down of Solar MWs Awarded to Date and Additional MWs Recommended for Sustainable Solar Manufacturing Industry											Total LTEP Generation	Total LTEP Conservation
	< 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
Additional MW Recommended (Year Awarded)	0	0	0	400	400	400	400	400	400	0	2,400	0
Already Contracted (Year Awarded)												
Micro-Scale~^	0	0	80	200	200	200	200	200	200		0	1,280
Small PV *	0	100	209	0	0	0	0	0	0	0	309	0
Large PV*	0	285	646	0	0	0	0	0	0	0	931	0
Samsung*	0	500	0	0	0	0	0	0	0	0	500	0
RESOP*	520	0	0	0	0	0	0	0	0	0	520	0
Sub-Total (MW)											**4,660**	**1,280**
Total (MW)											**5,940**	

Notes

~ microFIT MW allocated to LTEP Conservation Target

^ 80 microFIT MW contracts considered to be connecting prior to end of 2011

* Already contracted amount = 2,260 MWs

Appendix 3: FIT Pricing Schedule

Micro-Scale Market Sector (≤ 30 kW)

This section presents the assumptions used to calculate the recommendations for FIT Pricing for the micro-scale market sector.

0-5kW rooftop: There is significant potential for the further deployment of solar PV in urban areas across Ontario. There are 200,000 new Ontarians moving into 50,000 new homes every year making a natural FIT for Peak shaving of between 80 and 100 MW of additional capacity every year. These installations have much different installation cost and energy production considerations than larger rooftop installations do. The differing costs and production numbers are a function of urban rooftops having a greater likelihood of module shading and non-ideal tilt and azimuth angles. Because of these challenges CanSIA has used a year one production number of 1,050 kWh/kWp DC in its determination of the recommended FIT rate. Furthermore there are fixed costs such as permitting, truss engineering and modification that are the same regardless of system size which therefore account for a greater $/W impact on this smaller FIT tranche.

5-10kW rooftop: This tranche, paired with the updated eligible participants will allow microFIT installations on a wider range of project installations including small businesses and larger residential and agricultural rooftops. These projects typically reside on buildings that are less affected by the shading and exposure concerns typically seen in the 0-5kW space. These factors allowed CanSIA members to feel comfortable with the year one energy production number of 1,150 kWh / kWp DC as originally contemplated by the OPA.

0-10kW ground mount: There is no change to this tranche as it has been well subscribed within the FIT program already, not requiring any change in its application or administration. For the determination of the tranche for this rate CanSIA used production numbers of 1,500 kWh / kWp DC as the year one expected production from a dual axis tracker and 1,200 kWh / kWp DC as the expected first year production for a fixed tilt ground mount installation.

Installed Cost: When determining a reasonable installed cost number, CanSIA solicited its membership to get an understanding of what the current market price is for a variety of different project types and sizes. The installation costs were compiled and used to generate the input costs which generated the resulting FIT rates. The other important cost consideration that was surveyed and considered was the operations, maintenance and insurance costs associated with the various FIT tranches to ensure that the total cost picture was properly understood.

Operation, Maintenance and Insurance: During the installed cost review CanSIA also polled its members regarding he current cost requirements to operate the solar projects once built. Through the review it was determined that these costs are associated to operations and maintenance, which include the LDC fees, preventative maintenance and repair costs, and insurance. With more than two years of installation experience under the microFIT program in Ontario these costs are well understood for CanSIA's membership and we therefore believe that what is included here is very representative of the current market realities.

MicroFIT Annual Operations, Maintenance and Insurance Costs shown as $ / kW AC / year

	0-5kW RT	5-10kW RT	0-10kW FT	0-10kW DT
O&M	$50/kW	$50/kW	$20/kW	$90/kW
Insurance	$50/kW	$50/kW	$40/kW	$60/kW
Total	**$100/kW**	**$100/kW**	**$60/kW**	**$150/kW**

These operation, maintenance and insurance costs do not include the expected costs of an inverter replacement. CanSIA has estimated than inverter replacements will need to occur on microFIT systems in year 10 of the 20 year investment horizon and CanSIA has therefore included this expected cost in the detailed financial model. The inverter replacement costs for each of these tranches is assumed at ~$0.55/W AC.

Rate Justification: The recommended rates were based on a pre-tax return of between 11% and 13%. This number was chosen as it matched closely to the financial model described in the original FIT program documents providing the majority of customers an after tax return of between 8% and 10%. This return represents a decrease from the originally designed rates which were set to provide after tax investor returns of 11%.

The early success experienced by the microFIT project was largely to do with the fact that investors could expect these reasonable returns. As a technology that is relatively new to local investors this investment return must provide a return higher than other investment instruments to attract sufficient interest. As a track record of successful installations with proven returns is shown in the Province the rate can be further reduced while still attracting new investors to the program.

CanSIA conducted a high level sensitivity analysis on the 5kW AC and 10kW AC rooftop FIT rates as well as the 10kW ground mount FIT rate to understand what impact different rates would have on investor returns. The modeling inputs used for this sensitivity analysis were a debt rate of 7% with a term of 15 years. Our results indicate that a $0.07/W rate change results in a 4.5% to 6.2% spread in investor return. The results of this sensitivity analysis are listed here.

0-5kW Rooftop

FIT Rate	$0.715	$0.705	$0.695	$0.685	$0.675	$0.665	$0.655	$0.645
IRR	12.5%	11.8%	11.2%	10.5%	9.9%	9.2%	8.6%	8.0%

5-10kW Rooftop

FIT Rate	$0.670	$0.660	$0.650	$0.640	$0.630	$0.620	$0.610	$0.600
IRR	14.4%	13.5%	12.7%	11.8%	10.9%	10.1%	9.1%	8.2%

0-10kW Ground Mount

FIT Rate	$0.614	$0.604	$0.594	$0.584	$0.574	$0.564	$0.554	$0.544
IRR Fixed	13.1%	12.4%	11.7%	11.0%	10.3%	9.6%	8.9%	8.2%
IRR DT	13.0%	12.2%	11.4%	10.6%	9.9%	9.1%	8.3%	7.6%

In order for the microFIT program to continue to attract new investors and thereby continuing employment development in the Province of Ontario CanSIA recommends that the pre-tax IRR remain in the 11% to 13% range. CanSIA's estimation is that a reduction in the target pre-tax IRR below 11% will have a material effect on the future program uptake due to the investor's perceived risk of the technology.

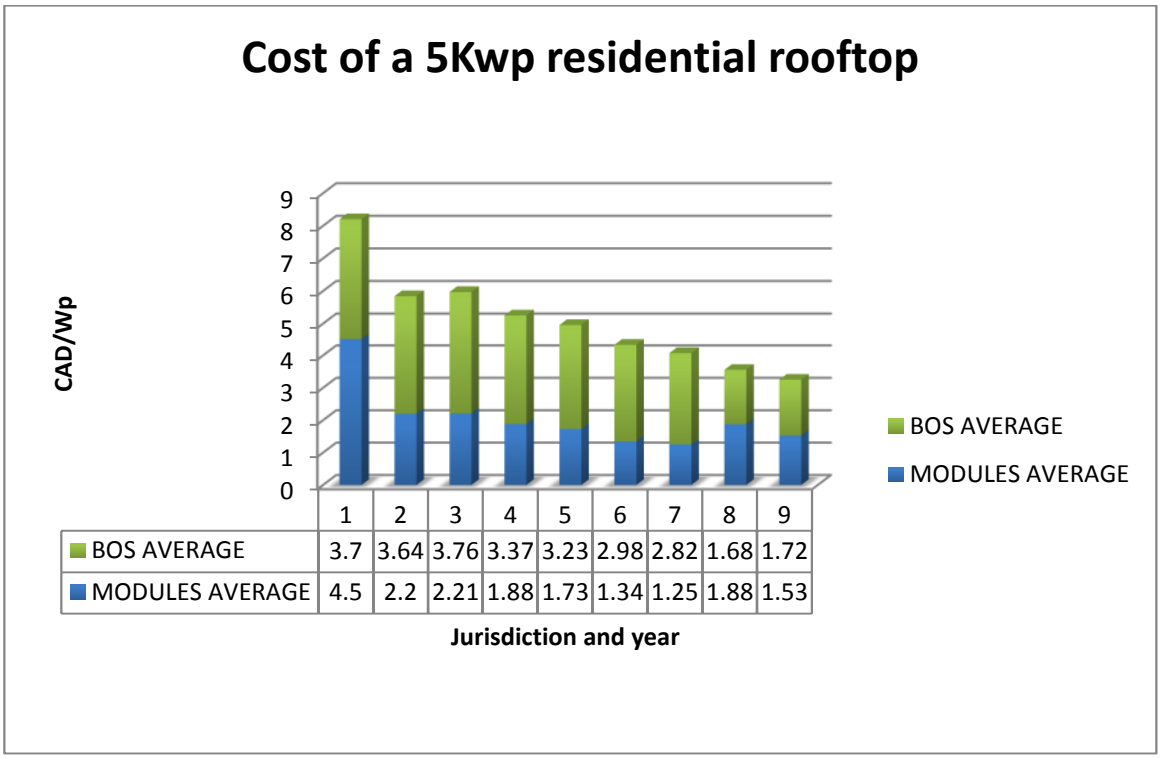
Cost Efficiency Opportunities: Unfortunately while Ontario's solar installation professionals have been improving their installation efficiencies over the last two years to drive cost out of the installation portion of the total system cost the regulatory costs have been increasing steadily. At the advent of the microFIT program typical LDC connection costs were in the $350 to $500 range. These same service costs have since increased to $1,500 to $1,700 and have been seen as high as $8,500 in a few instances. Furthermore, many municipalities are now requiring building permits with truss engineering and stamping for the structural install of PV which further increase the end user installed cost.

Significant installed cost efficiencies could be realized in the microFIT market were unified and cost reasonable requirements for permitting and interconnection of PV systems in Ontario put in place.

Pricing Factors and Degression strategy: In 2009 the microFIT program was put in place with an estimated installed cost per Wp of 8.2 CAD and a price of domestic panels of 4.5 CAD/Wp. Assuming the difference between the two to be the sum of power electronics, wiring, racking, regulatory and engineering, installation and profit, A.K.A. Balance of System or BOS, such BOS was estimated at the time to be 3.7 CAD/Wp. Coincidentally, studies for the California cost of BOS by LuxResearch indicated it at 3.64 USD/Wp in 2009. In spite of the very limited amount of installations occurred during 2011 in Ontario, the CANSIA members indicated their average BOS to be 3.76$/Wp, exactly aligned with the original expectations. A significant disparity between the installers reporting to Cansia exists, with +/- 1.3 CAD/Wp from the average, indicating a significant opportunity for further learning and improvement.

Other jurisdictions indicated, for similar 5KWp rooftop residential installations even better prices with Italy at 3.0 CAD/Wp (unofficial study) and Germany at a very low 1.7 CAD/Wp (EU-PV study for German BSW). Such lower prices can be explained by markets orders of magnitude larger than the Ontario one and an optimized process and industry.

Assuming continued improvement, it could be expected the Ontario installers should be able to achieve a BOS reduction of CAD 15 cents/Wp per year.



	1	2	3	4	5	6	7	8	9
BOS AVERAGE	3.7	3.64	3.76	3.37	3.23	2.98	2.82	1.68	1.72
MODULES AVERAGE	4.5	2.2	2.21	1.88	1.73	1.34	1.25	1.88	1.53

1-Original MicroFIT model, 2- USA 2009 actual, 3- Ontario 2011 actual, 4- USA 2011 forecast, 5- USA 2012 forecast 6- Italy 2011, 7- USA 2015 forecast, 8- Germany Q2 2011 actual, 9- Germany Q3 2011 actual

A different discussion should be made for the cost of Solar modules, that has quickly surpassed expectations, with an average of 1.99 CAD/Wp declared by CANSIA for 2011, but an actual even lower and estimated, at this time and for a 5KW system to be at 1.5 CAD/Wp

The reason for such a quick reduction can be summarized in 3 factors:

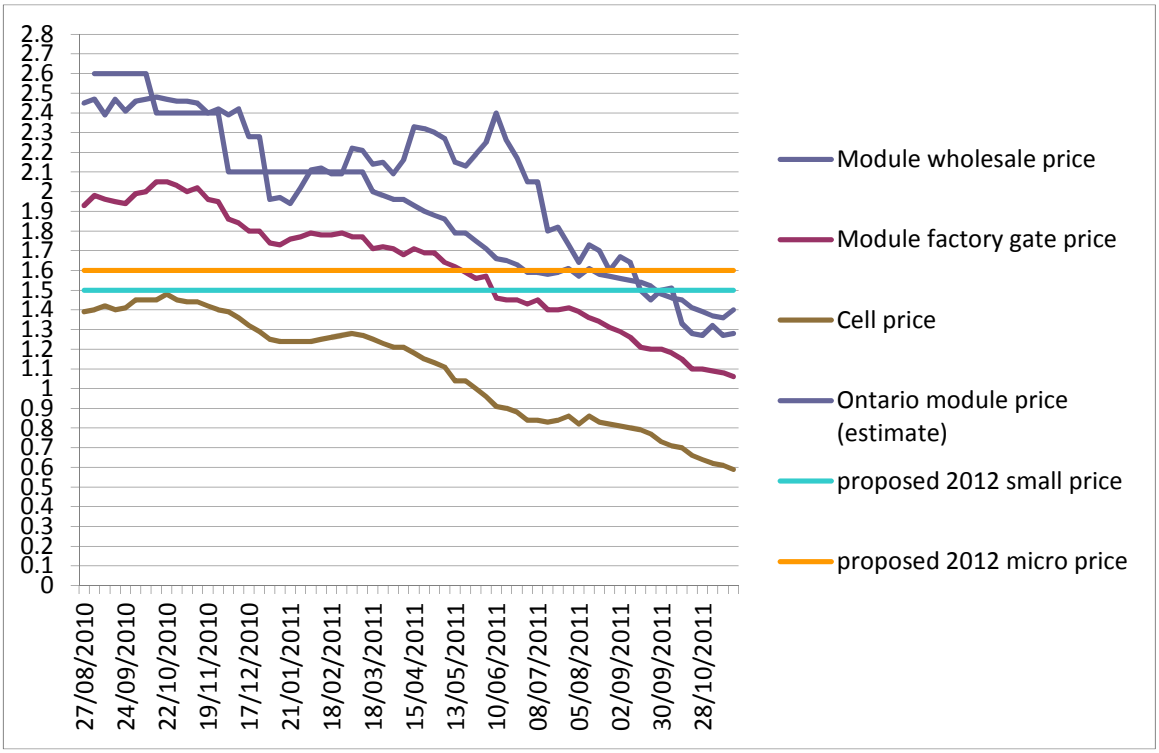
1) a dramatic overcapacity in the worldwide production of solar cells

2) a dramatic overcapacity in module production in Ontario (800 MW/year) vs. an estimated demand for domestic modules in 2011 (20MW)

3) The high level of automation achieved by local manufacturers of solar modules, necessary, but not yet sufficient, to compete with much larger foreign suppliers.

Due to the above reasons, the price of modules in Ontario has dropped to levels similar to the European ones, and linked directly to the worldwide price of solar cells (see the attached chart for the trends of pricing for modules and cells).

Due to the USA anti-dumping trade case against China, possibly followed by a rumored European one, Ontario could see a further short term reduction in cell prices, but that is not seen as sustainable due to the fact that cost of producing those cells has conceivably been higher than the subsidized price itself. Therefore, it is not recommended to consider further significant PV panels price reductions in the review of the microFIT model, and we suggest a price of 1.5 CAD/Wp for small systems and 1.6 CAD/Wp for micro systems.



Based on the discussion above, a significant decrease in costs has occurred in Ontario and worldwide since the launch of the FIT program. On a 5KW system, and based on the limited sample of data available to CANSIA at this time, such reduction in cost would indicate a 2011 average of 5.97 CAD/Wp ***(NOTE: This cost is based on DC Watts, so for comparison to the costs stated in Section 5, p.7&8, for 0-5KW systems the multiplier to be used is 1.2, so $5.97/W DC= $7.16/W AC. For systems 5-10KW AC, the multiplier to be used is 1.1, so $5.97/W DC = $6.56/W AC),*** composed of 2.21 CAD/Wp for panels and 3.76 CAD/Wp for BOS. Both components are expected to further be reduced over time, and it would be expected a further average reduction in 2012 of .39 CAD/Wp for panels and .15 CAD/Wp for BOS.

If the demand was to exceed to 200MW of the first tranche, a second "tranche" of 200 MW could instead be allocated to contracts that can reach a cost level of 5.37 CAD/Wp, representing a further cost reduction (degression) of10%. A similar approach has been taken (albeit for much larger volumes) recently by Germany for their own FIT program.

We also recommend a mechanism for collecting real time cost data from the contracts (i.e. a statutory declaration by the owner at contract execution or copy of the invoice paid) be initiated by the OPA, so that a dynamic degression mechanism can be used after 2012.

The Navigant All-In system costs for 2011 are quite similar to the proposed rates going forward for 2012 for CanSIA for a 5KW system which uses a 1.2 multiplier to convert from DC to AC KW. The CanSIA suggested All-In cost for 2012 is $6.80 / W AC which compares to the Navigant rate of $5.55 /W DC x 1.2 = $6.66/W AC. The Navigant All-In cost for 2012 is $5.15/W DC = $6.18/W AC and with the expected decline in costs of approximately 10% over 2012, the CanSIA All-In cost of $6.80/W AC would decline to $6.12/W AC. The main area for consideration is timing, with CanSIA considering that these costs will be achieved over the course of 2012 as opposed to being achievable Jan. 1, 2012.

Small-Scale Market Sector (30 kW to 500 kW)

The recommendations for amendments to the FIT Pricing Schedule for the Small-Scale Market Sector (10 kW to 500 kW) were derived from i) consultation with the CanSIA member-base that operate in this market sector and ii) review of research undertaken by a third party study of FIT pricing undertaken for CanSIA by Navigant Consulting Inc. (November 30, 2011) "Ontario Solar Pricing Update".

The Recommendation for pricing of $0.60 to $0.63 (> 30 kW ≤ 150 KW) and $0.53 to $0.55 (>150 kW ≤ 1 MW) differ to the results in the "Ontario Solar Pricing Update" of $0.494 (> 10 kW ≤ 250 KW) and $0.466 (> 250 kW ≤ 500 KW) for the following reasons:

- "Ontario Solar Pricing Update" built forecasts for the pricing required for future small-scale system costs (> 10 kW ≤ 250 KW and > 250 kW ≤ 500 KW) from a sample of installed systems in 2011. The majority of the systems analyzed were 250 kW. This has three key effects on the results of the study:

  I. The pricing for the 10 kW to 250 kW tranche is significantly lower than the CanSIA recommendation for the "Small FIT" category (30 kW to 150 kW). This naturally effects rate recommendation as well.

  II. The cost and pricing recommended by CanSIA for the "Standard FIT" category is more aggressive because of the assumption of larger system sizes.

  III. The delta between the different system size tranches reported in the Navigant study is very minimal because of the lack of variable system sizes.

The table below summarizes the differences between the Navigant study of the 10 kW to 250 kW size tranche and the numbers reported by CanSIA for the "Small FIT" tranche of 30 kW to 150 kW:

	Size Tranche	Installed Cost 2011	Installed Cost 2012	2012 FIT Recommendation
Navigant Tranche	10 kW – 250 kW	$4.25/W(DC)	$3.80/W(DC)	$0.494
CanSIA "Small FIT"	30 kW – 150 kW	$4.70/W(DC)	$4.20/W(DC)	$0.60

Because CanSIA and Navigant analyzed different system size tranches, the cost estimates and FIT recommendations are noticeably different. The creation of the "Small FIT" category for systems ranging from 30 kW to 150 kW was specifically designed to reflect the higher install costs associated with smaller systems, and this is borne out exactly in a comparison of the numbers presented by Navigant and those by CanSIA. "Small FIT" systems were not largely considered by the Navigant study which drives the difference in reported costs.

The table below summarizes the differences between the Navigant study of the 250 kW to 500 kW size tranche and the numbers reported by CanSIA for the "Standard FIT" tranche of 30 kW to 150 kW:

	Size Tranche	Install Cost 2011	Install Cost 2012	2012 FIT Recommendation
Navigant Tranche	250 kW – 500 kW	$4.15/W(DC)	$3.70/W(DC)	$0.466
Navigant Tranche	> 500 kW	$4.05/W(DC)	$3.60/W(DC)	$0.447
CanSIA "Standard FIT"	150 kW – 1,000 kW	$4.15/W(DC)	$3.55/W(DC)	$0.53

As the table shows, the CanSIA response and Navigant response report the same costs for 2011 when both groups are working with the same system sizes. In 2012, there is a deviation though because CanSIA's response includes systems all the way up to 1,000 kW which push costs down further. This price difference is understandable given the lack of sample projects above 500 kW considered in the Navigant study. The fact that the FIT rate recommended by Navigant is still more aggressive despite a higher cost assumption is directly attributable to the financing assumptions. CanSIA represents a diverse group of members with a variety of business models, so we included the returns associated with a variety of different financing assumptions.

Finally, because the Navigant study had to rely almost exclusively on data from systems in and around the 250 kW size, the study does not reflect a good understanding of the cost differences between system size groups. The table below summarizes the deltas between size groups as reported by both Navigant and CanSIA.

	"Small FIT" vs. "Standard FIT" Delta
Navigant Study	$0.10/W(DC) -$0.20/W (DC)
CanSIA Memo	$0.65/W(DC)

There are a significant number of fixed costs associated with project development that drive a large gap in system costs between smaller systems and larger systems. Because of the limited sample size available to Navigant, their report does not reflect this. For this reason, the CanSIA numbers are going to be more accurate when evaluating our recommendations.

The only other key difference that is contributing to differing results is the difference in financing and production assumptions. Navigant is fairly aggressive in terms of their financing assumptions, more so than any model presented by CanSIA. These two aspects have a significant effect on the rate recommendation.

CanSIA chose to represent an array of different financing assumptions and the returns associated with each. The options presented were based on member feedback, but because very little project debt has been raised to date, neither the CanSIA assumptions nor the Navigant assumptions are truly verifiable. Production on the other hand is something that should be easier to verify, and the number coming back from independent engineers does align closely with CanSIA's recommendation. The table below summarizes the differences between the CanSIA financing assumptions and the Navigant study assumptions.

	Navigant Study	CanSIA Memo
Interest Rate	6.5%	7.25%
Production	1,150 kWh/kW	1,100 kWh/kW

When the two studies are compared on an apples to apples basis, there are not a great number of differences between the two. Namely, the Navigant report really only reflects systems in the neighborhood of 250 kW. When the CanSIA study focused on this same sample size, as in the 2011 cost reporting, the delta is quite small. However, the CanSIA recommendation goes into a much greater analysis of both small and large systems which are not reflected in the Navigant study. This is primarily what drives the differences. There are also some small differences in financing assumptions that drive slightly different results as well.

Appendix 4: microFIT Timelines

Task	Delay possible	Description of possible delay and cause
Sale of system to customer, contract signed and deposit received		
Submit microFIT application		
Receive Offer to Connect from LDC		
Receive Conditional Offer from OPA with 6 month window		
SIX MONTH WINDOW STARTS		
Engage structural engineer to review building	YES	Coordination with engineer's schedule, access to proper drawings sometimes impossible, trusses and flat roofs open-web steel joist analysis can be complicated.
Engage racking supplier to liaise with structural engineer	YES	Back and forth with structural engineer, typically complex for flat roof projects as loading is specific to location/array orientation
Prepare and submit structural permit package for review by Municipality	YES	
Process payment with LDC to facilitate meter locate	YES	Processing of payments can sometimes go missing
Obtain meter locate from LDC	YES	Follow-up required with LDC, coordination required, LDCs understaffed
Procure materials		
Schedule installation of racking, panels, inverters, etc.		
If trenching/excavation is required, schedule locates for gas/hydro/phone	YES	Must be coordinated with LDC, phone and Enbridge
If hoisting with a crane is required, obtain permit as required	YES	May need to be coordinated with building department, can take weeks
Schedule LDC to disconnect and hold power for meter installation	YES	Must be coordinated with ESA. LDC crews schedule must match ESA inspectors schedule.
Schedule ESA for disconnect and hold	YES	Must be coordinated with LDC. ESA inspectors schedule must coincide with LDC disconnection crews schedule

Shut down power to building to install service disconnect and meter		In some areas ESA inspectors only work one day per week in the region, scheduling can go on for weeks as inspectors are allowed only one disconnect per day.
Obtain final inspection with ESA	YES	Sometimes inspectors will not final and inspection same day as shutdown
Receive pass from ESA and Connection Authorization (CA) sent to LDC	YES	Inspectors/ESA can forget to send through CA to LDC
Follow-up with ESA and LDC to confirm CA was sent/received	YES	LDCs can lose fax/notification of CA, follow-up is required often
LDC responsible to schedule meter installation	YES	CA goes to meter department, can be lost causing delays.
Follow-up with LDC to confirm meter installation has been scheduled	YES	Follow-up required confirming meter team has work order for meter installation, can takes weeks.