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CanSIA Submission to the IESO Conservation First Framework

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Executive Summary

CanSIA is a national trade association that represents the solar energy industry throughout Canada. CanSIA's vision for Canada's solar energy industry is for solar electricity to be a mainstream energy source and an integral part of Canada's diversified electricity mix by 2020, operating in a supportive and stable policy and regulatory environment within a similar time frame.

As part of the Conservation First Framework ("CFF"), the Independent Electricity System Operator ("IESO") initiated the Conservation Mid-Term Review to seek input regarding the review of the conservation framework. On July 6, 2017, the IESO asked stakeholders to provide input regarding the definition of Conservation Demand Management ("CDM"). The primary focus of CanSIA's submission is to address this matter and specifically to highlight the role that solar electricity, heating and cooling, and other complementary technologies like energy storage, can play in the IESO's Conservation First Framework.

In the current CDM definition, grid-connected solar electricity technologies were not considered eligible under the CFF primarily due to the fact these technologies were typically procured on a 20-year contract basis through separate centralized programs, being the FIT and microFIT programs. By 2018, distributed solar electricity will no longer be centrally procured through the FIT program or the microFIT program.

CanSIA agrees with the IESO that solar technologies, as well as solar plus storage technologies, align well with the Ontario's key climate, energy and economic policy objectives being; regional planning, greenhouse gas reduction, customer choice, peak electricity reduction, and innovation and economic development.

Other jurisdictions have implemented comprehensive energy policies with strong focuses on energy efficiency, demand response and conservation. Depending on the jurisdiction and the program, distributed energy resources, particularly solar technologies, have either been specifically included in the energy efficiency program (including incentives) or have been funded outside of the demand side management program, but always as part of a larger more encompassing energy policy.

CanSIA recommends that the IESO include solar electricity net metered generation, solar electricity behind-the-meter generation, and solar electricity distribution connected generation, within the next definition of CDM, therefore making solar electricity technologies eligible for CDM funding. Furthermore, CanSIA supports the inclusion of solar plus storage technologies within the CDM definition, as well as maintaining the inclusion of solar heating and cooling technologies (e.g. water or air heating) within the CDM definition.

CanSIA rationale for the inclusion of solar electricity within the next definition of CDM is based on the following:

- Solar electricity can greatly reduce electricity consumption on the distribution grid, along with providing other grid benefits such as peak demand reductions and alleviating grid congestion.
- Solar electricity aligns well with Ontario's policy objectives and can assist the IESO's in achieving its ambitious CDM targets.
- Both the FIT and microFIT programs have either ended or are ending soon.
- Many LDCs view solar electricity as a key technology solution for their CDM activities.

Furthermore, solar technologies have additional benefits such as rapidly declining costs, creating jobs within the local economy, and garnering strong public support.

Introduction

CanSIA is a national trade association that represents the solar energy industry throughout Canada. CanSIA's vision for Canada's solar energy industry is for solar electricity to be a mainstream energy source and an integral part of Canada's diversified electricity mix by 2020, operating in a supportive and stable policy and regulatory environment within a similar time frame.

The 2015-2020 Conservation First Framework maps out Ontario's energy conservation goals over the next six years, emphasizing a coordinated effort within all stages of energy planning, as well as more effective teamwork among sector partners, particularly with local distribution companies (LDCs). The CFF has an ambitious yet achievable goal to reduce electricity consumption by 8.7 TWh by December 31, 2020 primarily from conservation programs delivered by LDCs to residential and business customers across the province.

As part of the Conservation First Framework ("CFF"), the Independent Electricity System Operator ("IESO") initiated the Conservation Mid-Term Review to seek input regarding the review of the conservation framework which includes the 2015 to 2020 CFF and Industrial Accelerator Program. The intent of the review is focus on energy savings targets, budgets, progress, lessons learned, and alignment with Ontario's Climate Change Action Plan.

On July 6, 2017, the IESO asked stakeholders to provide input regarding the definition of Conservation Demand Management ("CDM"). The primary focus of CanSIA's submission is to address this matter and specifically to highlight the role that solar electricity, heating and cooling, and other complementary technologies like energy storage, can play in the IESO's Conservation First Framework.

Definition of Conservation Demand Management

One of the key tasks within the Conservation Mid-Term Review is to examine the definition of CDM and to assess what other technologies should be eligible within a new and updated definition of CDM. The current definition of CDM was established in the LTEP 2013 and subsequent ministerial directives. The 2014 Ministerial Directions to the OPA (now IESO) for Conservation First Framework provides the following definition:

Conservation First Framework: The OPA shall consider CDM to be inclusive of activities aimed at reducing electricity consumption and reducing the draw from the electricity grid, such as geothermal heating and cooling, solar heating and small scale (i.e. <10MW) behind the meter customer generation. However, CDM should be considered to exclude those activities and programs related to a Distributor's investment in new infrastructure or replacement of existing infrastructure, any measures a Distributor uses to maximize the efficiency of its new or existing infrastructure, activities promoted through a different program or initiative undertaken by the Government of Ontario or the OPA, such as the OPA Feed-in Tariff (FIT) Program and micro-FIT Program and activities related to the price of electricity or general economic activity.

In the current CDM definition, grid-connected solar electricity technologies were not considered eligible under the CFF primarily due to the fact these technologies were typically procured on a 20-year contract basis through separate centralized programs being the FIT and microFIT programs. By 2018, distributed solar electricity will no longer be centrally procured through the FIT program (which ended in 2016) or the microFIT program (which is scheduled to end in 2017).

Evolution of CDM Definition

The IESO, through the CFF consultation, has stated, “There are several technologies and approaches currently not included in the definition of CDM that have both customer and system benefits and align with one or more of the Government’s policy objectives.” The IESO has identified the Government of Ontario’s key climate, energy and economic objectives being; regional planning, greenhouse gas reduction, customer choice, peak electricity reduction, and innovation and economic development. Both the IESO and CanSIA agree that solar technologies, as well as solar plus storage technologies, align well with Ontario policy objectives (see the chart below).

Chart 1: Solar Alignment with Ontario Policy Objectives

	Policy Objectives					
Technology	Regional Planning	GHG Reductions	Customer Choice	Peak Reduction	Innovation	Energy Affordability
Solar	✓	✓	✓	✓	✓	✓
Solar + Storage	✓	✓	✓	✓	✓	✓

The IESO is also considering the inclusion of distributed energy resources (“DER”), such as net metered generation, behind-the-meter, distribution-connected generation, and energy storage that supply all or part of a customer’s electricity use. DERs can play an important role in assisting LDCs and customers reduce overall electricity load, relieve grid congestion, reduce peak electricity usage, and reduce greenhouse gas reductions.

Recommended CDM Definition

CanSIA recommends that the IESO include solar electricity net metered generation, solar electricity behind-the-meter generation, and solar electricity distribution connected generation, within the next definition of CDM, therefore making solar electricity technologies eligible for CDM funding. Furthermore, CanSIA supports the inclusion of solar plus storage technologies within the CDM definition, as well as maintaining the inclusion of solar heating and cooling technologies (e.g. water or air heating) within the CDM definition. By way of example, and building on the previous CDM definition, CanSIA presents the following CDM definition for consideration:

Conservation First Framework: The IESO shall consider CDM to be inclusive of activities aimed at reducing electricity consumption and reducing the draw from the electricity grid, such as geothermal heating and cooling, solar heating and cooling, solar electricity (i.e. behind-the-meter generation, net metered generation, and distribution connected grid-tied generation), and energy storage. However, CDM should be considered to exclude those activities and programs related to a Distributor’s investment in new infrastructure or replacement of existing infrastructure, any measures a Distributor uses to maximize the efficiency of its new or existing infrastructure, and activities related to the price of electricity or general economic activity.

Of note, CanSIA believes that solar electricity system size limitations should be excluded from the CDM definition. The reason being, there are additional regulations in place for solar net metering (i.e. O. Reg. 541/05: NET METERING) which provide requirements on system size, while solar electricity behind-the-meter systems by definition state that these systems cannot be larger than the required electricity needs of the load consumer. The

only area where the IESO may wish to consider a size restriction is for distribution connection grid-tied solar electricity systems, however, CanSIA believes that the LDCs should have the autonomy to determine the size of these projects as per their system needs or based on the LDC's specific CDM goals and objectives. If a size restriction were to be imposed, the current <20 MW suggested by the IESO could be appropriate.

Rationale for Recommended CDM Definition

Reducing Electricity Consumption

The main goal of the CDM, as mentioned in the current definition, is to reduce electricity consumption and reduce the draw from the electricity grid. Solar technologies, including solar electricity net metered generation, behind-the-meter generation, and distribution connected generation, are unique clean sources of electricity with a diverse set of attributes. Simply put, solar generated electricity can help LDCs reduce overall electricity consumption by encouraging the placement of solar at or near load customers. LDCs can also encourage the development of distribution connected solar facilities to alleviate grid congestion as part of their CDM and regional planning needs. Furthermore, the output of solar electricity aligns well with Ontario's electricity demand, with more production during peak hours than off peak. Finally, advances in energy storage and the dynamic controls available to solar electricity systems work well together to provide demand response benefits.

Policy Context and Achieving CDM and GHG Targets

Ontario has ambition yet achievable CDM and GHG reduction targets. To reach a total reduction of 8.7 TWh of electricity consumption by December 31, 2020 through CDM and to reduce 1990 GHG emissions levels by 15 percent in 2020, 37 percent in 2030 and 80 percent in 2050, solar will need to play a prominent role in Ontario's plans. Also, solar technologies are very popular with the public (see section *Customer Choice and Public Support*) which can assist in uptake of CDM programs.

Furthermore, solar electricity generation is very well aligned with the Ontario policy context as it relates to climate, energy and economic objectives being; regional planning, greenhouse gas reduction, customer choice, peak electricity reduction, and innovation and economic development (see section *Evolution of CDM Definition*). Solar electricity's central contribution to emissions reduction in Ontario is through the avoidance of GHGs from natural gas fueled electricity generation. Each kWh generated by solar technologies and consumed by electricity customers will generally avoid a kWh generated by natural gas. This is due to both natural gas generation and solar electricity generating during peak times, when electricity demand and price are highest.

End of FIT Program

Both the microFIT and FIT programs will be phased out by end of 2017. It is CanSIA's understanding that net metered and grid connected solar electricity technologies were excluded from the CDM definition because solar electricity technology was typically centrally procured on a 20-year contract basis through the FIT and microFIT programs. With both the FIT and microFIT programs ending soon, this should now open the door to consider including solar electricity technologies in the CDM definition and therefore making solar technologies eligible for funding within CDM programs.

To note, solar technologies may receive temporary grants and other financial incentives in the future due to the many favourable benefits that solar provides, including reducing greenhouse gases, encouraging local economic development, and reducing peak electricity and overall electricity consumption. Should additional temporary solar incentives be provided, it is CanSIA's view that solar electricity technologies should still be included in the new and updated definition of CDM as the technology's attributes help to clearly achieve CDM objectives, specifically to reduce electricity consumption and the draw from the distribution grid. That said, it may be helpful to have a coordinated, stacked or top-up incentive approach in situations where a customer has access to multiple solar incentives within a region. Due to the relatively high upfront cost of solar technologies, multiple incentives can help alleviate these upfront capital costs while providing significant benefits to the LDC distribution grid, the environment, and the local economy.

Solar Net Metering

For clarity, it should be noted that net-metering should not be considered an incentive program. Net metered solar systems do not provide a direct financial incentive (E.g. grant, rebate, etc.) from tax payers, the rate base or any other government funding. The real benefit to the net metered solar system owner is in displacing the electricity typically consumed from the grid. Net metered solar is purely a regulatory mechanism that allows load customers to connect a solar electricity system to the grid in a streamlined fashion, while at the same time continuing to pay for grid access through regulated fixed charges. At Ontario's current electricity rates, net metered solar is often not economically feasible and therefore additional financial incentives are required for customers and the grid system to reap the many benefits of solar.

LDC Opportunity

The 2014 Distributor Scorecard published by the Ontario Energy Board ("OEB") shows that only 6 of 72 LDCs (8 percent) have met their Net Annual Peak Demand Savings target, and only 41 of 72 LDCs (57 percent) have met their Net Annual Energy Savings target. Solar electricity can be an effective option for LDCs to meet their CDM targets. Adding solar electricity to the definition of CDM and making it eligible for CDM funding provides LDCs with a proven solution they can utilize today to help address electricity consumption reduction, peak reductions, grid congestion, etc. while providing their customers with greater choice when it comes to managing their energy needs.

CanSIA understands that many LDCs wish to see solar electricity and energy storage technologies added to the definition of CDM and therefore be eligible for CDM funding. For example, PowerStream's (now Alecktra) 2015 CDM plan included a residential solar incentive program for 2018-2020 that would pay customers an incentive for solar electricity systems, to reduce load on the distribution grid.

As indicated by the IESO, "The CDM plan allows LDCs to design and manage their own program offerings, giving them greater flexibility to align conservation programs to local needs, and provide more customer choice. It will also ensure long-term, stable funding to give LDCs certainty to implement and deliver programs in their CDM plans." If solar electricity is for some reason excluded from the new definition of CDM, it will reduce the options available to LDCs to address electricity reduction issues and other concerns within their jurisdiction where solar may be the best solution.

Jurisdictional Scan

Alberta

Alberta has implemented a comprehensive climate and energy plan to reduce carbon emissions while diversifying the economy and creating jobs. Alberta's Climate Leadership Plan includes:

- implementing a new carbon price on greenhouse gas emissions
- ending pollution from coal-generated electricity by 2030
- developing more renewable energy
- capping oil sands emissions to 100 mega tonnes per year
- reducing methane emissions by 45% by 2025

As such, the Alberta Government has legislated that 30 percent of Alberta's electricity will come from renewable sources solar, wind and hydro, by 2030.¹ As a result, it is estimated that \$10.5 billion in new investment will flow into the provincial economy by 2030, creating at least 7,200 new jobs.² This is expected to lead to the installation of 5,000 MW of renewable energy capacity by 2030.

When it comes to conservation and energy efficiency, Alberta's Climate Leadership Plan includes a commitment to reinvest all revenue from the carbon levy into Alberta's economy, including \$645 million over 5 years to energy efficiency. Investment in energy efficiency and community energy system programs are expected to help to reduce energy use and associated costs, greenhouse gas emissions, and support green jobs.³

Prior to 2017, Alberta did not have an energy efficiency program. However, this is now an area in which Alberta wants to be a climate leader. As such, a new government agency was created, Energy Efficiency Alberta. The mandate of this organization is:

- To raise awareness among energy consumers of energy use and the associated economic and environmental consequences.
- To promote, design and deliver programs and carry out other activities related to energy efficiency, energy conservation and the development of micro-generation and small-scale energy systems in Alberta.
- To promote the development of an energy efficiency services industry.

To promote renewable generation for reducing electricity load, a key component of Alberta's energy efficiency program was the introduction of a residential and commercial solar incentive program. These solar programs offer rebates to homeowners, businesses and non-profits that install solar electricity systems.⁴

¹ Province of Alberta. [Renewable Electricity Act](#).

² Province of Alberta. [Renewable Electricity Program](#).

³ Province of Alberta. [Energy Efficiency Alberta](#)

⁴ Energy Efficiency Alberta. [Solar Program](#).

New York

The state of New York is undertaking a significant transformation within its electricity sector⁵. As part of their comprehensive *Reforming the Energy Vision* (REV) the state has outlined the following three objectives:

- 40 percent reduction in greenhouse gas emissions from 1990 levels
- 50 percent of energy generation from renewable energy sources
- 600 trillion Btu increase in statewide energy efficiency

To achieve these goals, the REV initiative will implement regulatory changes that promote more efficient use of energy, deeper penetration of renewable energy resources such as wind and solar, wider deployment of “distributed” energy resources, such as micro grids, roof-top solar and other on-site power supplies, and storage. It will also promote markets to achieve greater use of advanced energy management products to enhance demand elasticity and efficiencies.

New York’s approach is to take an integrated approach whereby the promotion and financial support for renewables and other technologies, such as solar and storage technologies, are very much part of the overall goals to achieve energy efficiency within the state. As such, the New York Public Service Commission, on February 26, 2015, required each utility to submit an annual Distributed System Implementation Plan (“DSIP”), which will serve as the template for utilities to develop and articulate an integrated approach to planning, investment and operations. As required by the February REV order, the DSIP will be a comprehensive filing, to include information related to all distributed energy resources, including energy efficiency, demand response, distributed storage and distributed generation.⁶

The 2015 State Energy Plan (SEP) states that 50 percent of all electricity used in New York by 2030 should be generated from renewable sources. By letter of December 2, 2015, Governor Andrew Cuomo directed the Department of Public Service to develop a Clean Energy Standard that converts the SEP targets into enforceable requirements.⁷

To assist in the acceleration of renewable energy in meeting energy efficiency and generation objectives, New York created a Green Bank to provide a variety of financing tools targeted at alleviating financial market barriers and harnessing capital markets.⁸ Furthermore, the state has implemented a progressive virtual net metering regulation along with a community shared solar program that provides customers with greater access to solar electricity, particularly to those with low incomes, do not own their home, or do not have the proper roof setting to adopt solar. By signing up for the community shared solar program, participants subscribe to a solar energy system and receive credit on their energy bills. Property owners who agree to host community shared solar systems both earn money from lease payments and support the community; and, they don’t have to pay for the system themselves.⁹

⁵ New York State. [Reforming the Energy Vision](#).

⁶ New York State. Department of Public Service. [Utility Energy Efficiency](#).

⁷ New York State. Department of Public Service. [Clean Energy Standard](#).

⁸ New York State. Department of Public Service. [Clean Energy Fund](#).

⁹ New York Solar Partnership. [Shared Solar NYC](#).

New York has also implemented a Property Accessed Clean Energy (“PACE”) financing system. Through the Energize NY Finance Program, PACE financing is made available to eligible property owners to provide attractive financing for property improvements to make energy efficiency and renewable energy upgrades to buildings.¹⁰

Scan Conclusion

In conclusion, the jurisdictions reviewed above and through the IESO Mid-Term Review analysis (including Massachusetts, California and Vermont) have implemented comprehensive energy policies which often integrate complementary climate and economic development policies. Furthermore, as part of these jurisdictions’ energy policies, there is a strong focus on energy efficiency, demand response and conservation. Depending on the jurisdiction and the program, distributed energy resources, particularly solar technologies, have either been specifically included in the energy efficiency program (providing incentives) or have been funded outside of the demand side management program, but always as part of a larger more encompassing energy policy.

Additional Benefits of Solar

Forecast of Solar Costs

The cost of solar has fallen sharply in the last decade in Canada. This can be attributed primarily to a drop in the cost of modules but also to declines in costs associated with an industry of larger scale and predictable structure – such as customer acquisition, installation labour, utilization efficiency, and financing. As the cost of solar declines further, it will approach grid parity with the Ontario retail cost of electricity between 2020 and 2026.

There are several research organizations that have differing views on the pace of cost reductions for solar electricity into the future, but there is unanimous consensus that costs will continue to decline. For example:

- NREL projects 0.4 - 4.7% annual system cost decline 2014-2025
- IEA projects 4.2% annual system cost decline 2015-2020
- Green Tech Media Research projects 5.6% annual module cost decline 2012-2017
- Tracking the Sun VIII – LBNL Sunshot (expects a 9% 2015 reduction)
- ITNPV projects 3.5% average annual system cost decline 2015-2025¹¹

CanSIA, as part of its Distributed Generation Task Force report, is targeting a 5 percent annual installed cost decrease over the next 20 years for residential and commercial/industrial solar generation facilities.¹² Price decreases are expected to be driven by technological advances and addressing barriers to the adoption of solar generation including soft costs.

¹⁰ Energize NY Commercial Program. Website: <http://commercial.energizeny.org>

¹¹ ITRPV 2015 Roadmap – Relative System Cost Development for Systems 2014 – 2025

¹² CanSIA, Distributed Generation Task Force Report, pg. 21.

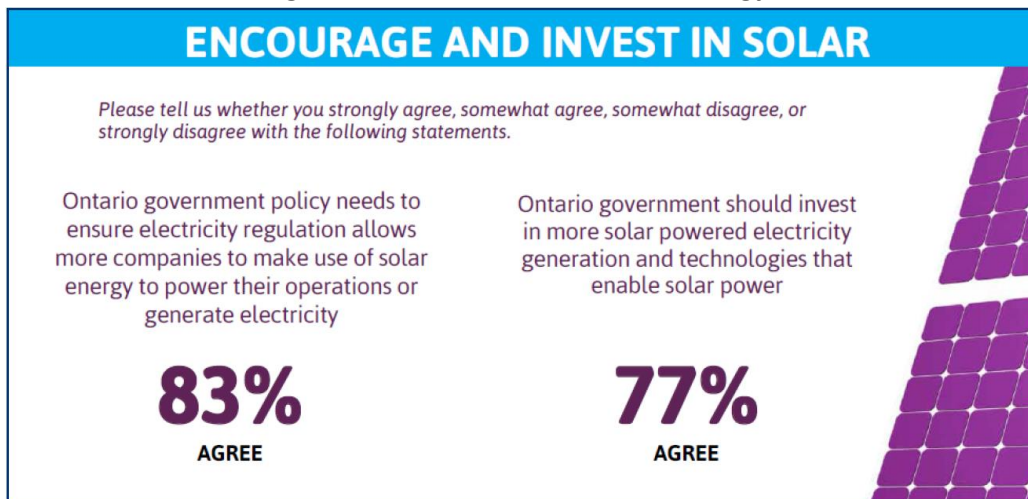
Jobs and Economic Development

Ontario is recognized as a solar energy global leader as the Green Energy and Green Economy Act and related renewables procurement programs has created a robust and globally competitive solar energy sector in the province. For the past 7 years the industry has largely focused on building Feed-in Tariff (FIT) and microFIT projects. Since the introduction of these programs Ontario has seen impressive growth in the amount of solar that has been connected to the electricity grid. In total, Ontario has achieved over 2,200 MW of installed solar, with approximately another 500 MW in the pipeline. Going forward, CanSIA projects that if 200 MW of solar electricity is installed per year over the next 5 years in Ontario, it would result in the creation of 14,500 person years of employment and approximately \$2.5 billion of economic activity over the life of the solar systems.¹³

Customer Choice and Public Support

Solar generation is becoming increasingly accessible to Ontarians who wish to take a more proactive approach to managing their energy and electricity needs. As such, solar generation is very popular among Ontarians and continues to be broadly supported throughout the province. In May 2015, the Gandalf Group, on behalf of CanSIA, undertook market research that found job creation and the economy to be the most important issues identified. Ontarians support significant reductions in air pollution, and support measures that would maintain these reductions or go even further.

Figure 1: Ontarian’s View on Solar Energy¹⁴

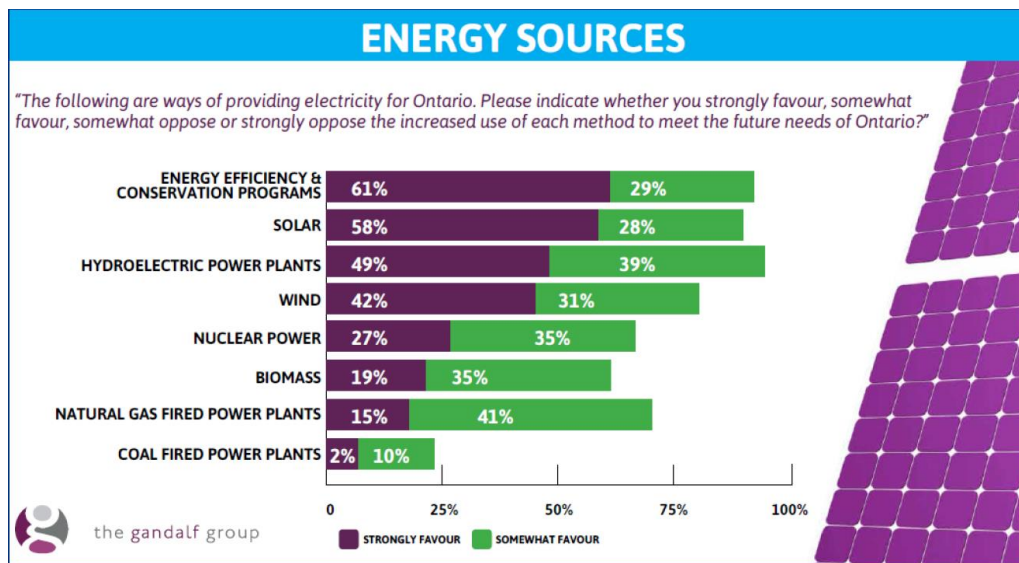


Solar generation resonates with the public as a tool for fighting climate change, supporting high-tech and job creation in this sector. The study found very little opposition to increased use of solar to meet future needs and a preference for solar on rooftops compared to fields. Solar generation was considered the most popular source of energy, after energy efficiency.

¹³ CanSIA, Distributed Generation Task Force Report, NREL JEDI Model Economic Impacts Analysis, pg. 15.

¹⁴ Gandolf Group, May 26, 2015

Figure 2: Ontarian’s View on Solar Energy, Technologies and Policies



Conclusion and Summary of Recommendations

For the IESO to achieve its ambitious yet achievable CDM targets while aligning with the Ontario policy context, which includes deep GHG emission reductions, solar technologies will need to play a prominent role in the CFF going forward. Many LDCs have struggled to achieve their past CDM targets.

Due to solar technologies’ unique and favourable attributes, solar electricity is well positioned to contribute meaningfully to achieve Ontario’s CDM and GHG reduction targets. As such, CanSIA recommends that the IESO include solar electricity net metered generation, solar electricity behind-the-meter generation, and solar electricity distribution connected generation, within the next definition of CDM, therefore making solar electricity technologies eligible for CDM funding. Furthermore, CanSIA supports the inclusion of solar plus storage technologies within the CDM definition, as well as maintaining the inclusion of solar heating and cooling technologies (e.g. water or air heating) within the CDM definition.

By including solar electricity technologies within its CDM program, Ontario will be joining other leading jurisdictions who have also included solar technologies with their energy efficiency and demand side management plans, as part of their overall energy plans.

Sincerely,

Wesley Johnston
 Wesley Johnston
 Vice President, CanSIA