



Distributed Solar Electricity: Market Outlook and Role of Utilities

“Launching Energy Efficiency in Alberta”, Edmonton

17th, January 2017



CanSIA

CANADIAN SOLAR
INDUSTRIES
ASSOCIATION

L'ASSOCIATION DES
INDUSTRIES SOLAIRES
DU CANADA

- CanSIA is the national trade association representing the solar energy industry throughout Canada since 1978.
- Our vision for solar electricity in 2020:
 - Mainstream energy source, integral part of diversified electricity mix.
 - Industry will be sustainable with no direct subsidies.
 - Supportive and stable policy and regulation recognizing true value.
- CanSIA's "Solar West 2017" in Westin Edmonton, May 10–12.



What is distributed solar electricity's:
role in energy efficiency; & outlook in Alberta?

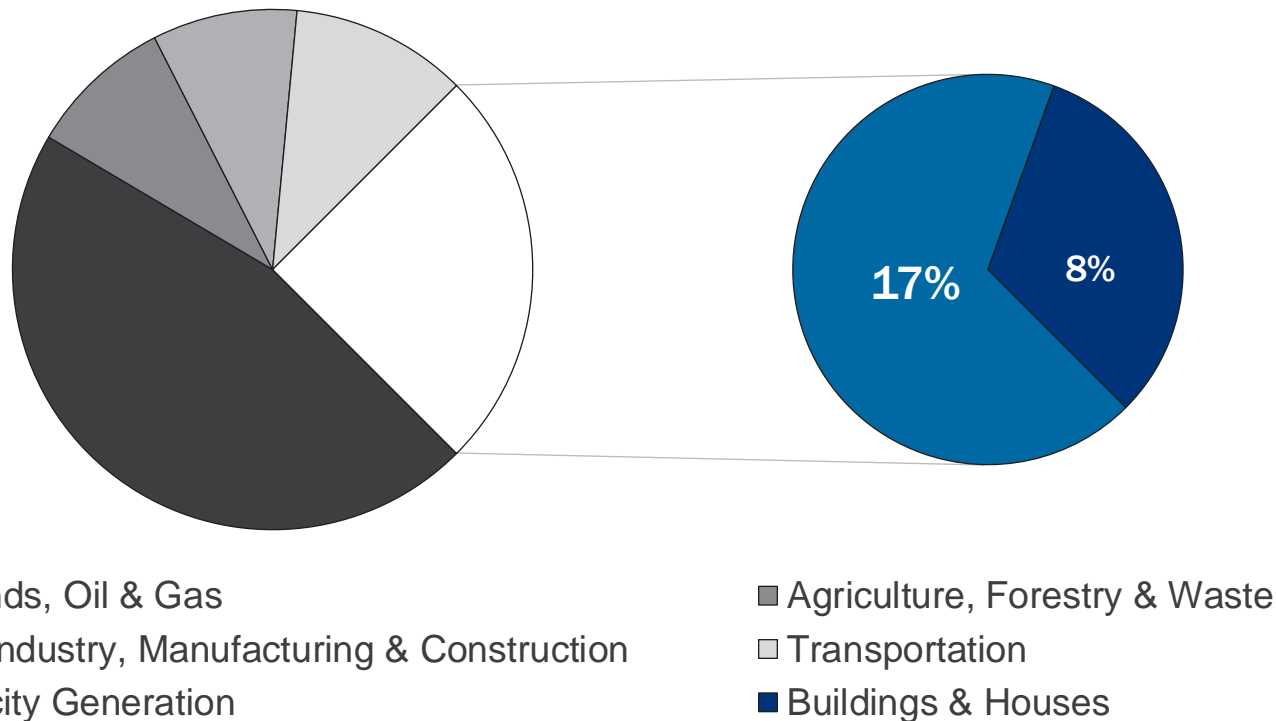
What change will distributed solar electricity bring for: electricity consumers; and utilities?



Distributed Solar Electricity: Role in Energy Efficiency

SOLAR ELECTRICITY: ROLE IN ENERGY EFFICIENCY (1/3)

- Alberta's electricity sector accounts for 17% of the province's total annual GHG emissions (more than twice that of buildings at 8%)*.



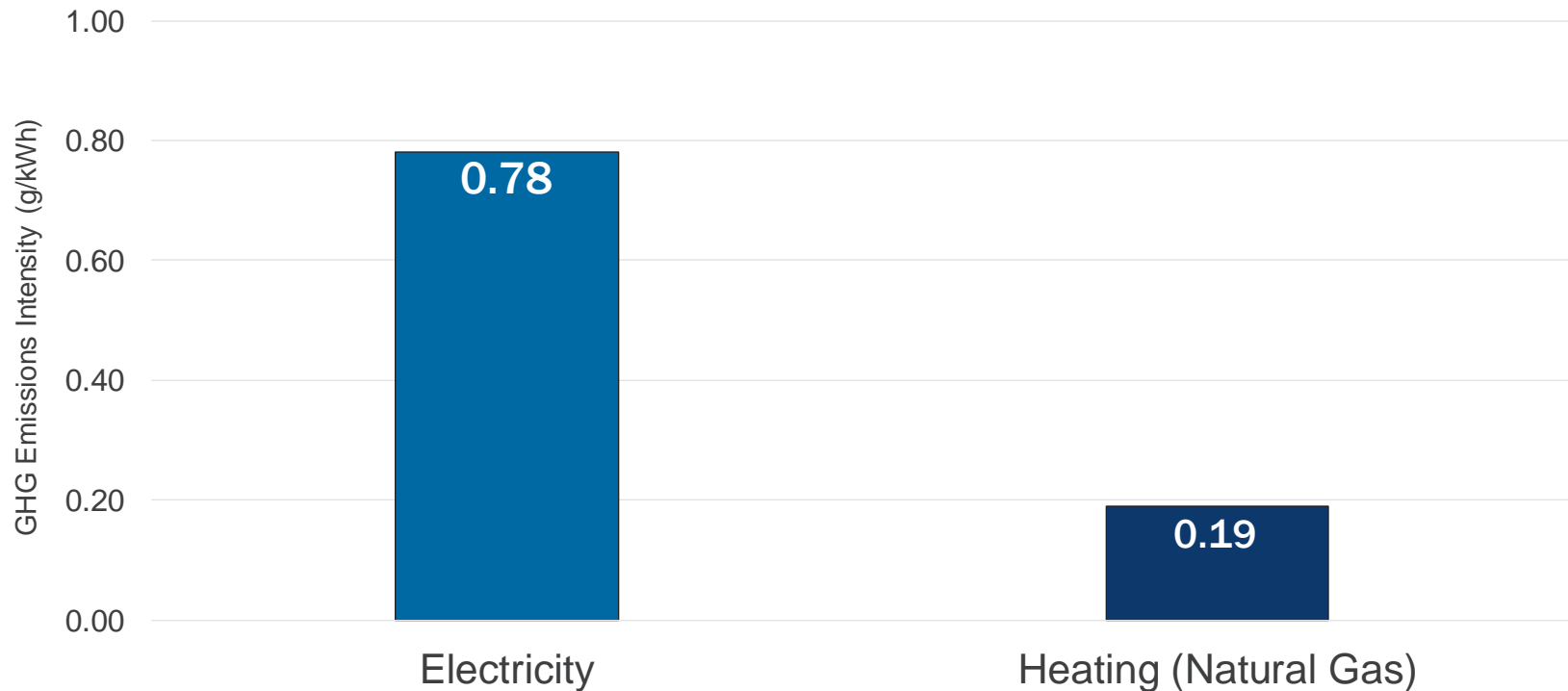
■ Oil Sands, Oil & Gas
■ Other Industry, Manufacturing & Construction
■ Electricity Generation

■ Agriculture, Forestry & Waste
■ Transportation
■ Buildings & Houses

* Ref: Climate Leadership Report to Minister (November 2015)

SOLAR ELECTRICITY: ROLE IN ENERGY EFFICIENCY (2/3)

- Each unit of grid electricity in Alberta produces four times more GHG emissions than a unit of building heating with natural gas.



* Electricity including line losses = 0.78 g/kWh. Gasoline in 30% efficient engine = 0.70 g/kWh. Natural gas in 80% efficient furnace = 0.19 g/kWh.

- Distributed solar electricity supports efficiency in electricity sector:
 - No Fuel: Energy payback for solar modules is <1 – 2 years.
 - Line Losses: Generating close to load reduces delivery distances.
 - Consumer Behaviour: Real-time data informs better usage decisions.
- Greening the grid also enables emissions reductions through electrification of transportation and industrial processes.
- As with other energy efficiency solutions, solar electricity presents significant job creation and economic development potential.



Distributed Solar Electricity: Outlook in Alberta

- Alberta legislated 30% renewable electricity by 2030 (Q4 2016). CanSIA will release report exploring potential of electricity market share from solar in Alberta to 2030 (Q1 2017).
- Factors affecting the outlook for solar electricity include:
 - Economic: when will solar cost less than retail rates for electricity?
 - Policy: at what pace will policy prepare province for a solar future?
 - System: will power-system planning embrace distributed resources?



Distributed Solar Electricity: Change for Consumers

- Consumers adopt efficiency and solar for various reasons:
 - Personal preferences (e.g. environmental, self sufficiency).
 - Long-term price certainty (e.g. hedge against future costs).
 - Most require 5 – 7 year “payback”.
- Albertans have limited incentive to be efficient today due to low retail electricity rates due to over-supply (& \$68/MWh RRO ceiling).
- For these reasons, consumers will not change without: i) programs; ii) economies-of-scale; and ii) regulatory modernization.

- Programs are effective to kick-start markets, but “off-ramp” needed.
- Economies-of-scale decrease unit costs, increase competitiveness. Measures for solar electricity include:
 - Increased Micro-Generation (MG) cap from 1 to 5 MW.
 - Ability to serve aggregated loads with a single facility under MG.
 - “Community-Solar” policy framework under development.
- Regulatory Modernization ensures appropriate compensation for new products and services from market. Measures would include:
 - New process for monetizing small amounts of environmental attributes.
 - Compensation for system benefits (i.e. reduced line losses).



Distributed Solar Electricity: Change for Utilities

- As consumers embrace efficiency and go solar, the traditional electricity distribution utility role faces new challenges and opportunities including:
 - Economic: higher rates to recover grid maintenance and expansion costs from consumers who are using less.
 - Policy: consumers expect more choice, digital engagement and new products and services but current regulation restrictive.
 - System: grid must balance supply and demand more dynamically and manage bi-directional flows.
- In near-term, utilities need to need able to recover costs associated with enabling efficiency and solar and manage interconnection processes.
- In medium-term, utilities need to be prepared for a new paradigm where consumers are also producers (“prosumers”) on a smarter cleaner grid.

CONCLUSION(S)

- Energy efficiency is critical to meeting Alberta's Climate Leadership goals. Efficiency in electricity sector can deliver significant emissions reductions.
- Distributed solar electricity can be key part of solution as it generates electricity without consuming fuel, close to load & empowers "prosumers".
- Energy efficiency and distributed solar electricity generation require:
 - Programs in the interim to kick-start market activity.
 - Policy that enables economies-of-scale to increase competitiveness.
 - Regulatory modernization so sectors thrive in future without support.

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