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Fact Sheet 6
Grid-connected Solar Photovoltaics

	Photovoltaic Technology Option (Existing Technology)	Building Integrated Photovoltaic (BIPV)
2001 Domestic Capacity	0.297MW[1]	0 MW
Overview of Technology	Distributed generating systems powered by the sun. Components include a photovoltaic array comprising many individual photovoltaic modules and one or more power conditioners that convert the DC power from the array to utility AC power, which is fed into the buildings utility service. Solar is also used off-grid where it is used as DC power. • Existing solar panel technology is standalone units. • Future technology has photovoltaic modules integrated into roof shingles, windows, or siding.	
Product(s)	1. Electricity 2. Natural hedge against hydrocarbon fuel price 3. Emission Reductions 4. Environmental Attributes not directly associated with emission reductions.	
Equipment Manufacturing Centers	United States, Japan, Spain, Germany, Australia, India, Netherlands, Malta	Germany, Japan, United States, Canada (ATS - Spheral Solar flexible modules), others
Technology Stage	Mature, Commercial and continued price reductions in modules and balance of systems.	Technology is commercially available
Applications	Distributed power supply at load -BIPV: applications are similar to hard-wired energy efficiency measures.	
Cost estimate for generation	Cost: C$900/MWh [2] Capital Cost: C$9,033/kW installed Operating Cost: zero	Cost: C$134/MWh[3] Capital Cost: C$1,300/kW installed Operating Cost: $5/MWh
Impacts: Positive	• Meets majority of building electrical needs • Zero emissions • No toxic wastes • Non-depleting resource • Improved grid stability through distributed generation • Employment: local design and installation jobs • Engagement of consumers in electrical supply	• Replacement of building materials with solar cells. • Meets majority of building electrical needs • Zero emissions • No toxic wastes, depending on technology • Non-depleting resource • Improved grid stability through distributed generation • Employment: local design and installation jobs, national manufacturing jobs • Engagement of consumers
Impacts: Negative	• Intermittent supply	• Intermittent supply • Potential toxic waste liability for metallic thin-film PV modules (Canadian technology does not pose this liability)
Potential in Canada	Potential of 400 MW[4] if 10% of Canadian homes installed a system. Approximately 13,000 GWh p.a. Contrary to intuition, solar resource in many parts of Canada is good since solar efficiency increases as colder temperatures.	151 TWh per year in Canada if all appropriate surfaces of building envelopes (shadow free) were considered.[5]
Existing Barriers in Canada	• High capital costs • Lack of solar PV interconnection policies of distributors, despite established equipment standards and certification. • High interconnection costs imposed by some distributors. • Lack of net metering policies • Lack of consumer awareness.	• Lack of commercialization of low-cost solar PV modules. • Lack of solar PV interconnection policies of distributors, despite established equipment standards and certification. • High interconnection costs imposed by some distributors. • Lack of net metering policies/programs

1. Ayoub.J. Dignard-Bailey, L., Filion, A. *Photovoltaics for Buildings* NRCan, Varennes, Quebec, Nov. 2000
2. Includes solar modules, mounting frames, grid-intertie inverter, electrical accessories, installation at today's market prices.
3. Assumes $1/Watt solar module cost, $0.25/Watt inverter cost, electrical accessories, and installation at 5% of solar array cost each. Assumes no financial value for replaced building materials. Significant potential for cost reductions if value is factored in
4. Assuming that 10% of 10,000,000 buildings in Canada install a 3.4 kW system, adjusted to 0.4 kW average capacity to reflect solar resource. Good solar energy resources in most parts of Canada.
5. *International Energy Agency Report* IEA - PVPS T7-4:2002

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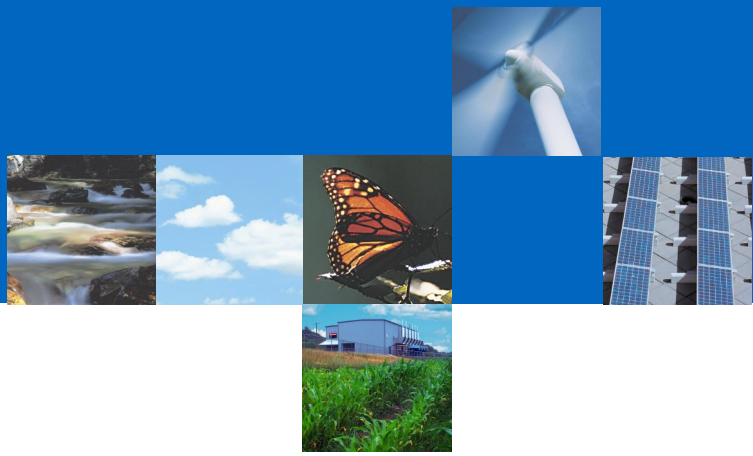

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