

# Calgary Community Solar

Oct 24, 2011



**SkyFireEnergy**  
Solar Energy Systems

# SkyFire Energy Inc

- Alberta based energy company with 7 employees in Calgary and 3 in Toronto.
- **Greater proven energy reserves than all the fossil fuel companies in Alberta combined.**

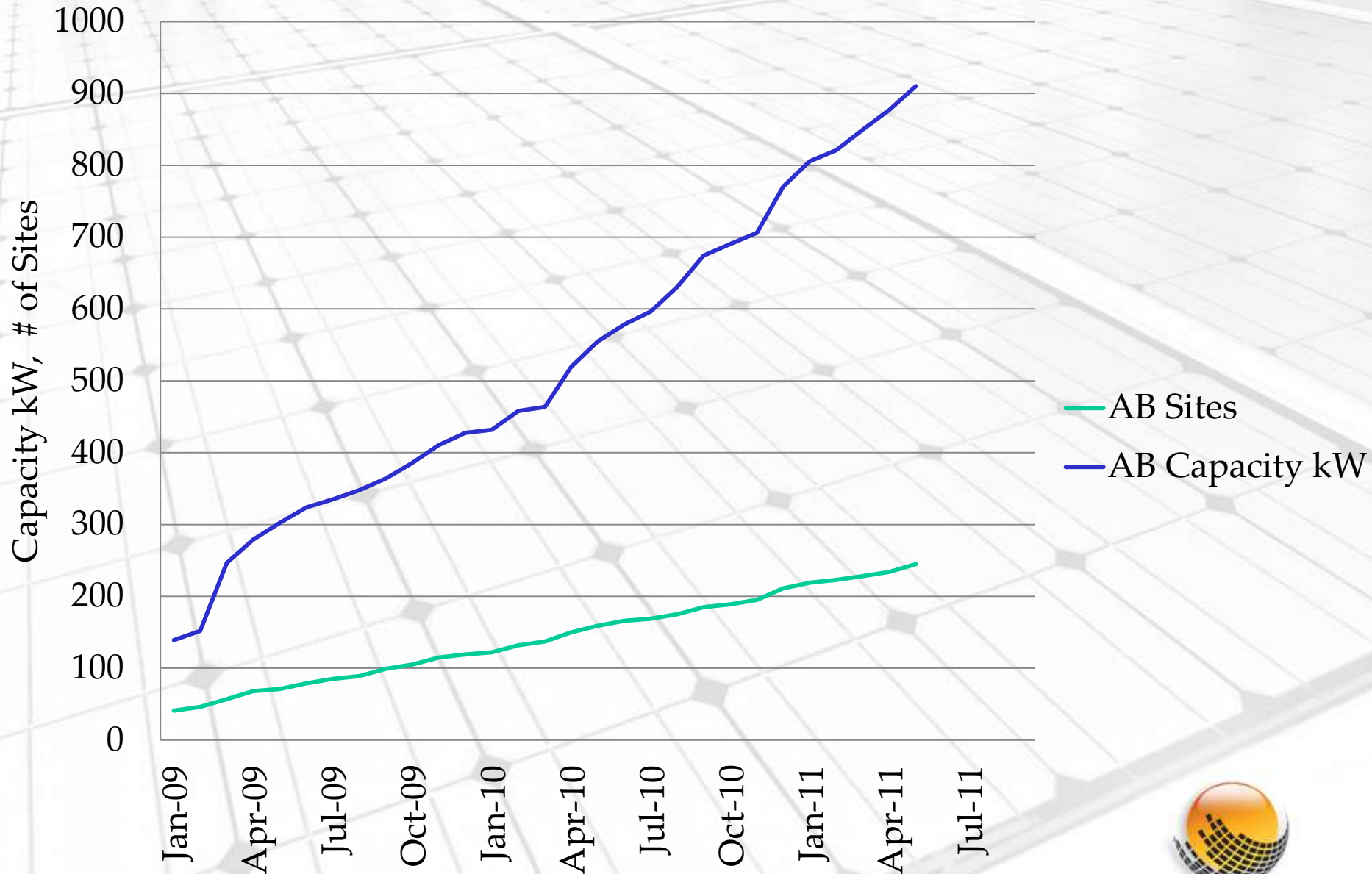


# Alberta Solar Potential

Ranking of Major Cities Worldwide in Terms of Yearly PV Potential	
City	Yearly PV Potential (kWh/kW)
Cairo, Egypt	1635
Los Angeles, USA	1485
Sydney, Australia	1343
Calgary, Alberta	1292
Edmonton, Alberta	1245
Washington, DC., USA	1133
Tokyo, Japan	885
Berlin, Germany	848
London, England	728

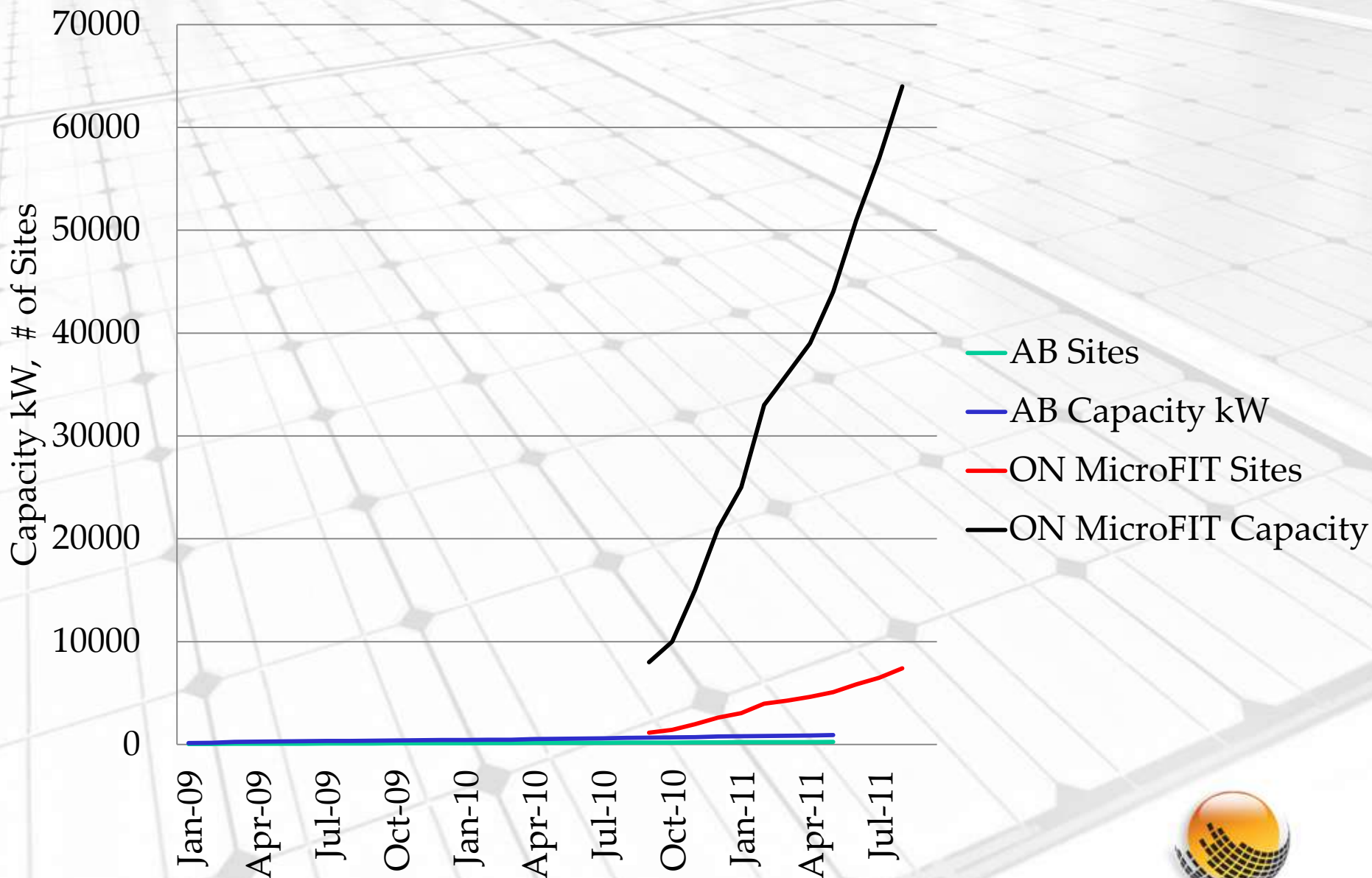
Source: Natural Resources Canada

# PV Growth in Alberta



Source: Alberta Utilities Commission

# PV Growth in Alberta and Ontario



Source: Alberta Utilities Commission, OPA

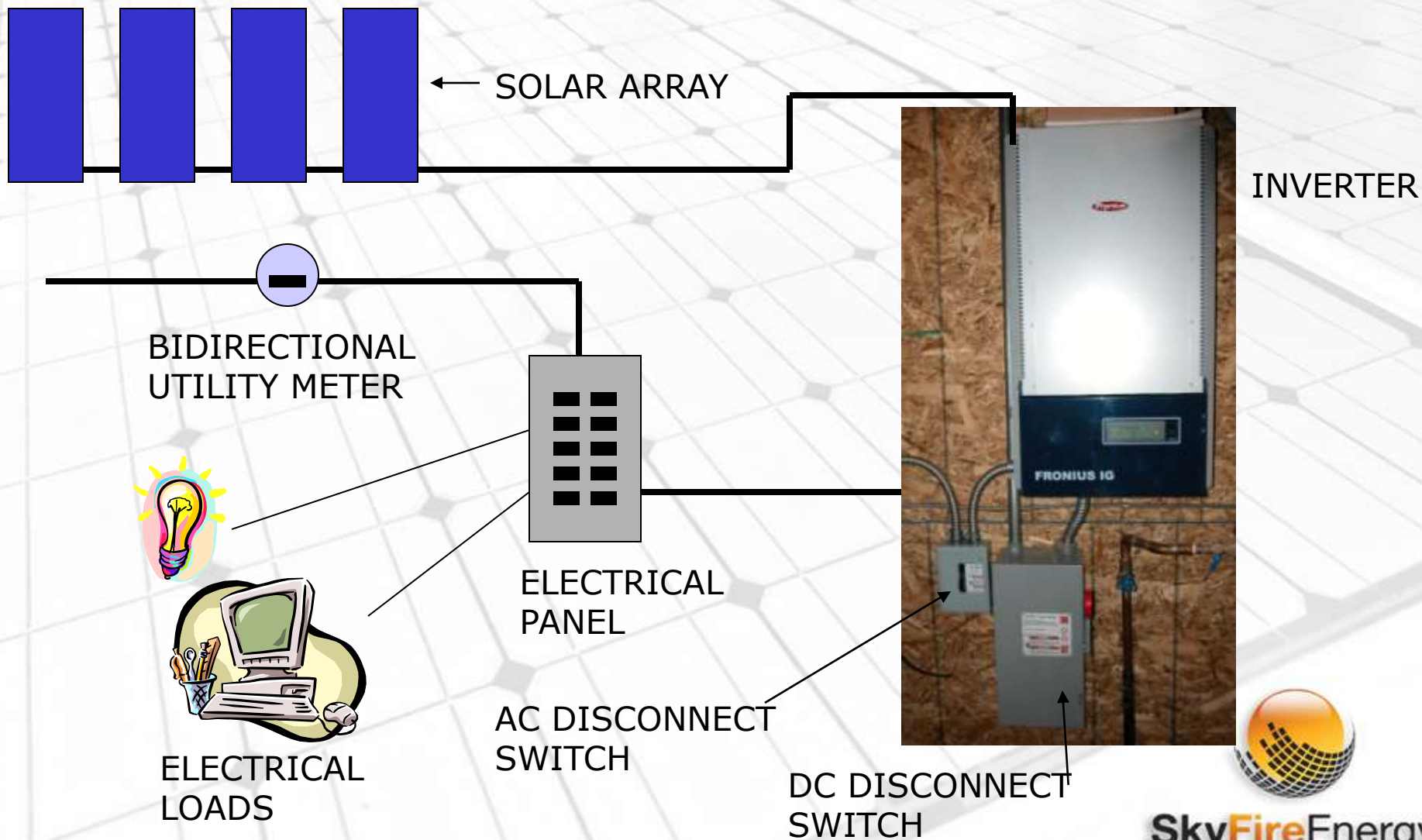
# What is driving the growth?

## Alberta Micro Connect policy

- All wire owners must allow grid tie PV systems
- Retail rate compensation for export
- Retail rate is going up
  - Moving 30 day average: \$0.159 Sept 16, 2011
  - CCS will double or triple the cost of electricity in Alberta at the \$200-\$300 per ton prediction
- Albertan's have money to invest
- Medicine Hat
  - Hat Smart \$1000 grant for PV systems
- Edmonton
  - Looking at a FIT program
- Enmax
  - Solar rental program for EasyMax customers



# Grid Tie System





## ENPHASE MICROINVERTER



- One inverter per module instead of one inverter per array of modules
- Advantages
  - Maximum Power Point Tracking (MPPT) per module maximizes output of system and limits effects of shading
  - Cost is less for smaller systems
  - Monitoring system
  - Allows for modular systems - Start small and add later!
  - 15 year warranty (Standard for string inverters is 10)
- Disadvantages
  - Higher cost for larger systems
  - Demand is high
  - Newer product; not as proven







BI-DIRECTIONAL

FOCUS kWh  
TYPE ALP FH 35 2-2004 240V  
TASO 60Hz KH 7.2 1PH 2W  
ENMAX 561730  
FW 3.22  
76 326 609  
Landis+Gyr

Solar power system  
Two power source  
Parallel system

# What is driving the growth?

Retail prices of photovoltaic systems are dropping

2001 600 watt array \$12,000 \$20/ watt

2005 1952 watt array \$20,000 \$10/watt

2011 2000 Watt array \$10,500 \$5/watt



# Grid Parity

We are near grid parity:

$$\frac{4000 \text{ watts} \times \$5.00 \text{ per watt}}{4 \text{ kw} \times 1300 \text{ kWhr/kw/yr} \times 30 \text{ yrs}} = \frac{\$20,000}{156,000 \text{ kWhr}} = \$0.1282/\text{kWhr}$$

Current retail rates are \$0.07- \$0.12 plus T&D in Alberta

Expect a doubling or tripling of retail rates with CCS at \$200-\$300/tonne

REC Renewable Energy Certificate option may help us to reach grid parity sooner. Renewable energy has greater value than coal fired energy. Clean, Local, distributed



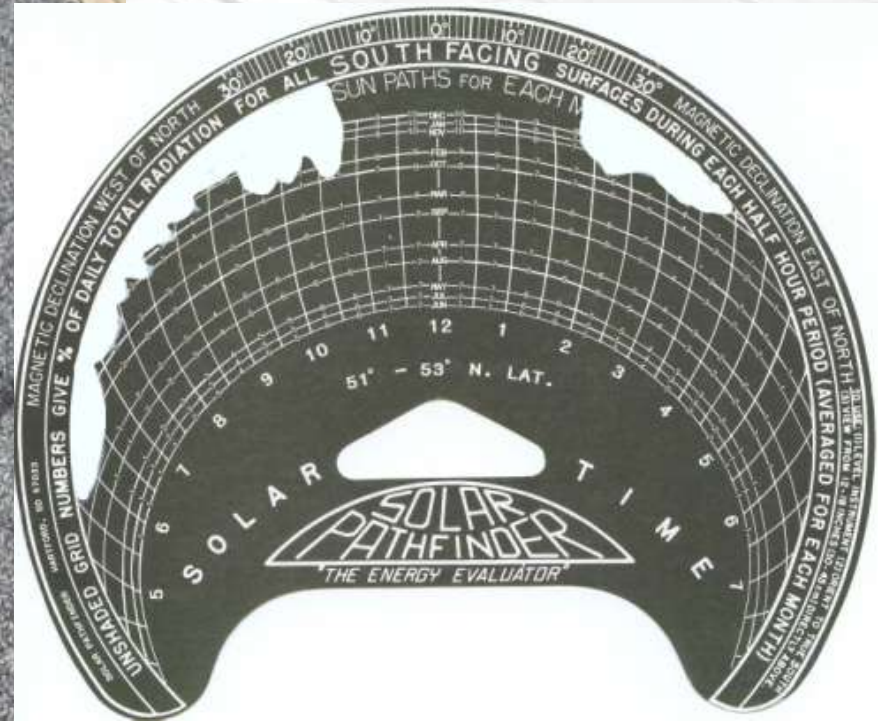
# What is holding Alberta Back?

- No incentive programs
- Lack of public awareness
- Provincial government favors other solutions to carbon issues
- Up front cost of PV and ST system
- Low cost of energy: both gas and electricity



# SOLAR PATHFINDER PLOT

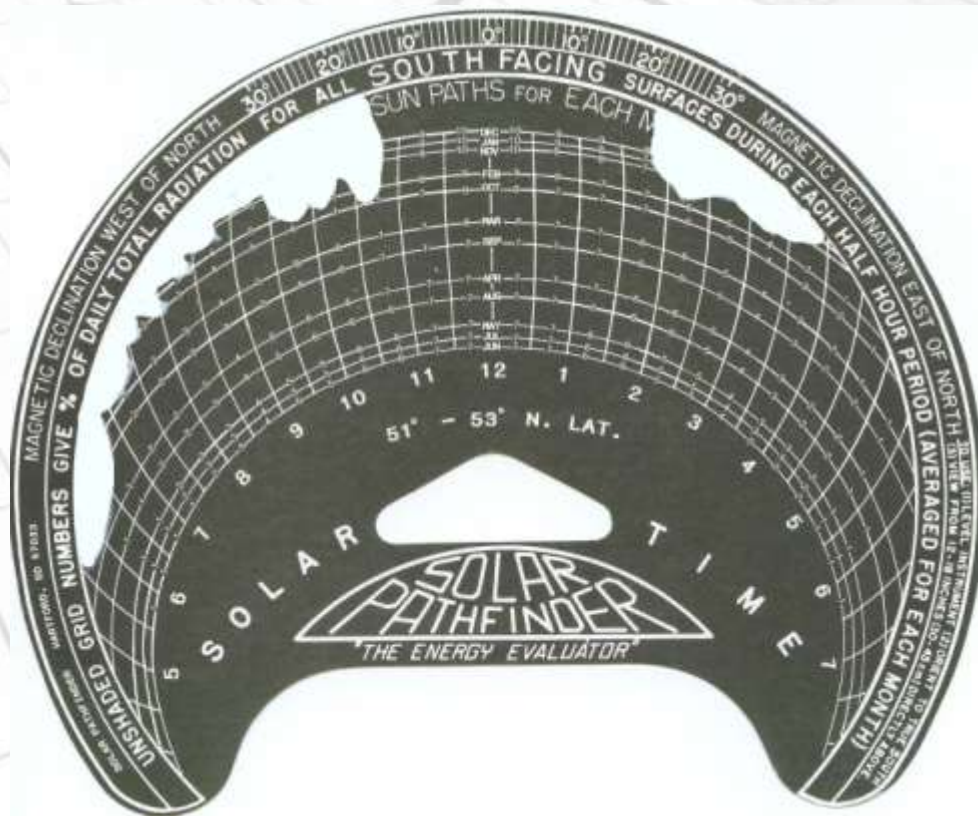
## Determines Solar



# SITE SURVEY RESULTS

## Solar Pathfinder Plot Canmore Residence

January	49%
February	76%
March	99%
April	100%
May	100%
June	100%
July	100%
August	100%
September	99%
October	97%
November	50%
December	51%



# What is Happening in Alberta?



Forest Lawn High School 720 watts



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# Typical Residential Array



- Residential grid-tied system, Calgary
  - 2000 watt system
  - 10 x Sanyo 200 watt modules
  - Fronius 2000 watt inverter



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- Residential grid –tied system, Calgary
  - Net Zero house – 5.33kW grid – tied system
  - 26 x 205 watt modules
  - 26 x Enphase Micro-inverters
  - Minimize effects of shading

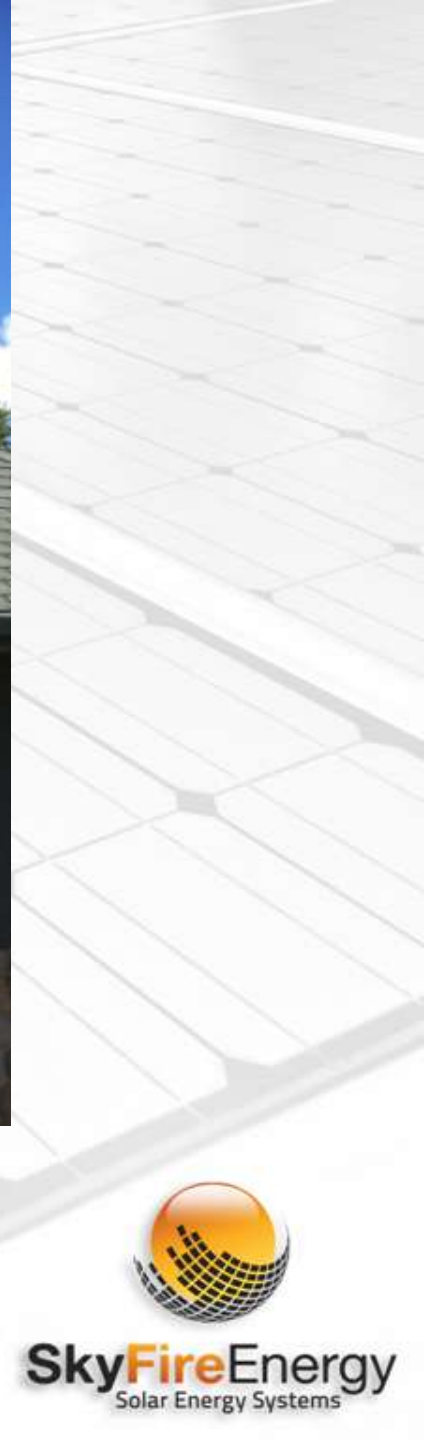


# Somerset Community Solar





- Somerset Community Water Park, Calgary
  - 2640 watt system
  - 12 x 220 watt Mitsubishi modules
  - Enphase Micro Inverters



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Mounting  
Rails

Enphase Micro  
Inverter



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# Commercial Photovoltaic Installations



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# **Commercial Grid –tied system Ironwood Building Systems**

- 4.68 kW grid-tied system
- 24 x Sanyo HIT 195 Watt modules
- SMA Sunny Boy 5000 Watt inverter

# Grande Cache Correctional Facility

- 13.5 kW grid-tied system







## City of Calgary Municipal Building

- 1.02 kW Grid-tied system
- 1800U Sunny Boy inverter
- Kiosk
- Internet monitoring device

# MNC Geomatics Ltd.

- 5.2 kW grid-tied system
- 26 - Canadian Solar Inc. 200 Watt modules
- SMA Sunny Boy 6000 Watt inverter



# Downtown Energy Center



Solar  
Array



# OCCE – Penticton, BC – 260kW

- Largest System in Western Canada
- Rack – 6 different types, angles used
- 1106 x Conergy 235 watt modules
- 2 x Satcon Solstice 100kW inverters, 12 x MPPT combiners



# Other PV applications



# Solar Thermal- Calgary





# Jayman Ascent Condo - Calgary

40 collector commercial EnerWorks system





# Southland Leisure Center

## Pool Heating System

150 collectors



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# Questions?

[www.SkyFireEnergy.com](http://www.SkyFireEnergy.com) | 403-251-0668

