



01 Oct 2015
Canada US Clean Energy Dialogue
Solar Energy Opportunities in the North



Green Sun Rising Inc.
1680 Kildare Road
Windsor, ON N8W 2W4
Phone: 519-946-0408
Email: info@GreenSunRising.com





Renewable Energy Technology

Agenda:

1. Who we are
2. Solar irradiation data for NWT
3. Solar PV examples in the North
4. example deployable off-grid systems
5. examples solar thermal, EVs, off-grid lighting
6. Q & A





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1. Who we are Green Sun Rising:

Windsor's longest operating solar company.

Founded in January 2008, before the Ontario Green Energy Act. Professional engineering company, for solar PV and solar thermal.

Well over 1,500 kW of implemented grid-connected PV systems, over 2.5 MW of solar mounting systems, and ST. Supported by leading solar manufacturing companies.





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Green Sun Rising:

Benefiting from the decades of solar engineering know-how of our European partner companies, we started off where they left.

We use professional engineering tools and proven methodologies in our designs.

Over 200 successfully completed solar system projects in Canada to date.





Renewable Energy Technology

The RET-Center in Windsor:

We created the Renewable Energy Technology Center in Windsor, by converting a closed automotive tooling factory, renovating it and “recycling” it into new life. We operate the large showroom, with inside and outside operating solar systems and solar demonstrations, our office, the warehouse, and the manufacturing shop, where we also manufacture solar mounting systems.

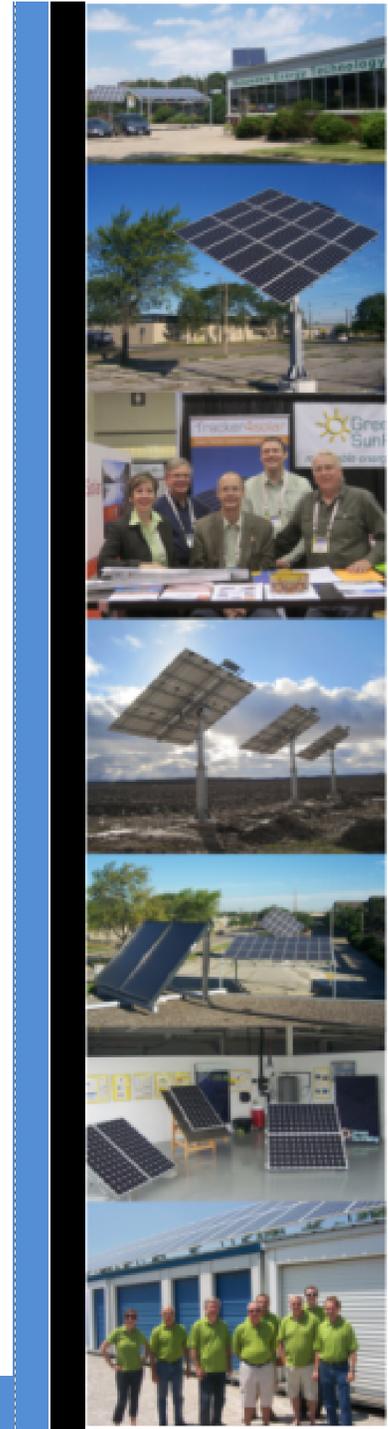
We provide training, seminars, support the visits of groups, hold events, and receive school classes etc.

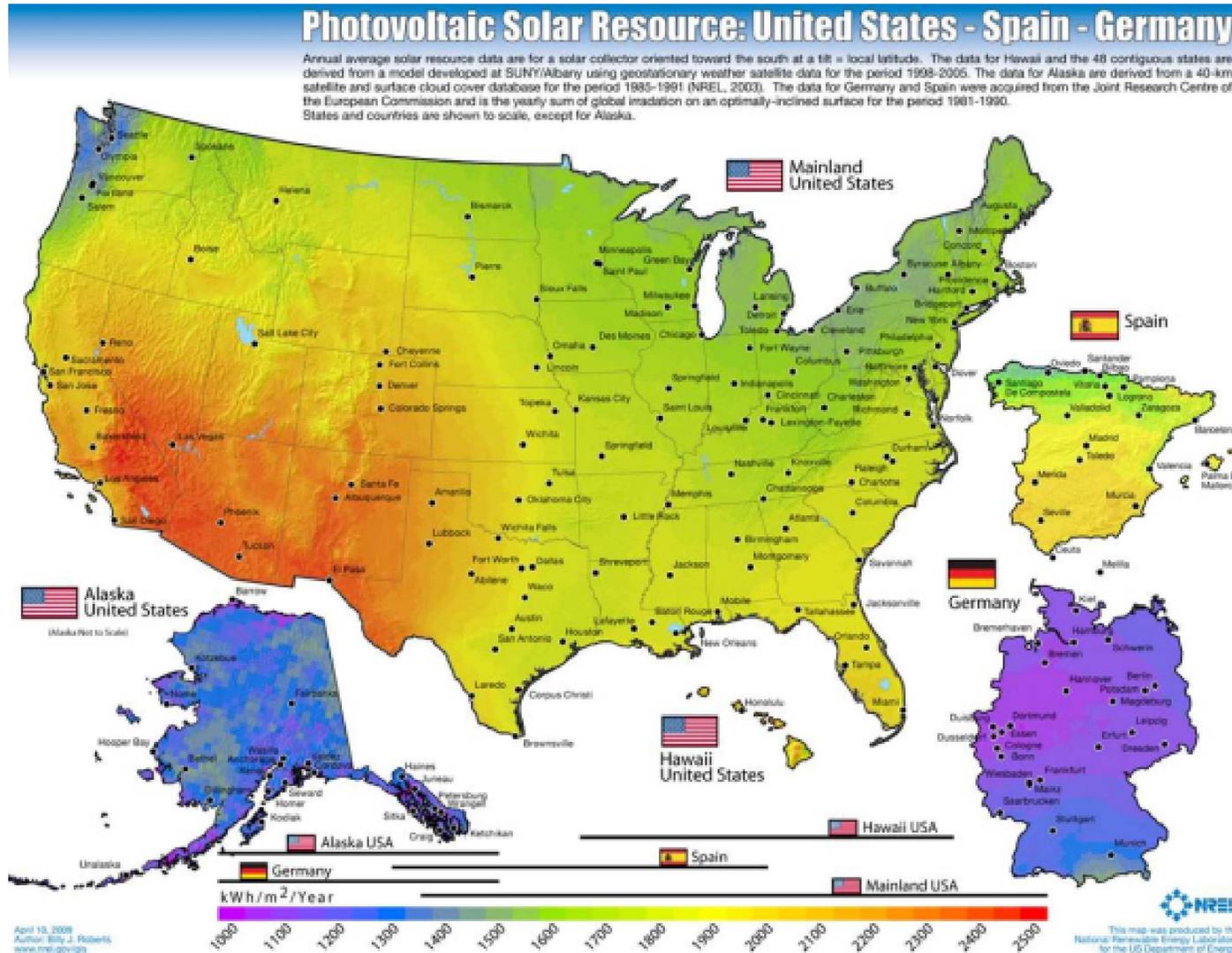
We have provided formal solar training programs for the University of Windsor, and the St Clair College.



2. Solar Irradiation data for NWT:

	Yellowknife NWT	Inuvik NWT	Windsor ON	Rio De Janero	Berlin Germany
	kWh/m ² /d				
January	0.31	0.06	1.81	5.21	0.79
February	1.16	0.53	2.72	5.41	1.48
March	3.04	2.06	3.72	4.76	2.41
April	5.05	4.33	4.94	4.31	3.75
May	5.65	5.58	6.09	3.66	4.77
June	6.24	6.42	6.64	3.65	4.80
July	5.71	5.31	6.41	3.66	4.77
August	4.24	3.44	5.49	4.32	4.18
September	2.43	1.78	4.30	4.18	2.76
October	0.96	0.64	2.98	4.74	1.61
November	0.38	0.11	1.79	4.97	0.85
December	0.15	0.00	1.37	5.02	0.61
Annual	2.95	2.53	4.03	4.49	2.74





3. Solar PV examples in the North

1. example ground mounted
largest solar project in NWT in 2015: 82 kW solar PV into Colville Lake
2. example roof-top mounted
largest solar project in NWT in 2014: 60 kW solar PV into Hay River
3. newly awarded project in progress
Northern-most solar project in NWT: 15 kW solar PV into Sachs Harbour on Banks Island





Renewable Energy Systems

82.5 kW AC Colville Lake NT - Phase 2



Modular design: 3 rows of 5 sections each in 208VAC 3-phase
each section has 22 modules of 260W DC each, 5.72 kW DC
each section has 22 micro-inverters 250W AC each, 5.5 kW AC

www.GreenSunRising.com





Renewable Energy Systems

example Colville Lake NT



5 section per each row – perfectly scalable up or down

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Renewable Energy Systems

example Colville Lake NT



AC combiner panels per each row

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Renewable Energy Systems

ballast pans using local ballast (gravel/dirt) – floating on the permafrost



made exclusively from aircraft quality aluminum and stainless steel
light-weight for shipping; easy and fast to assemble; front accessible
fasteners for the module installation www.mounts4solar.com

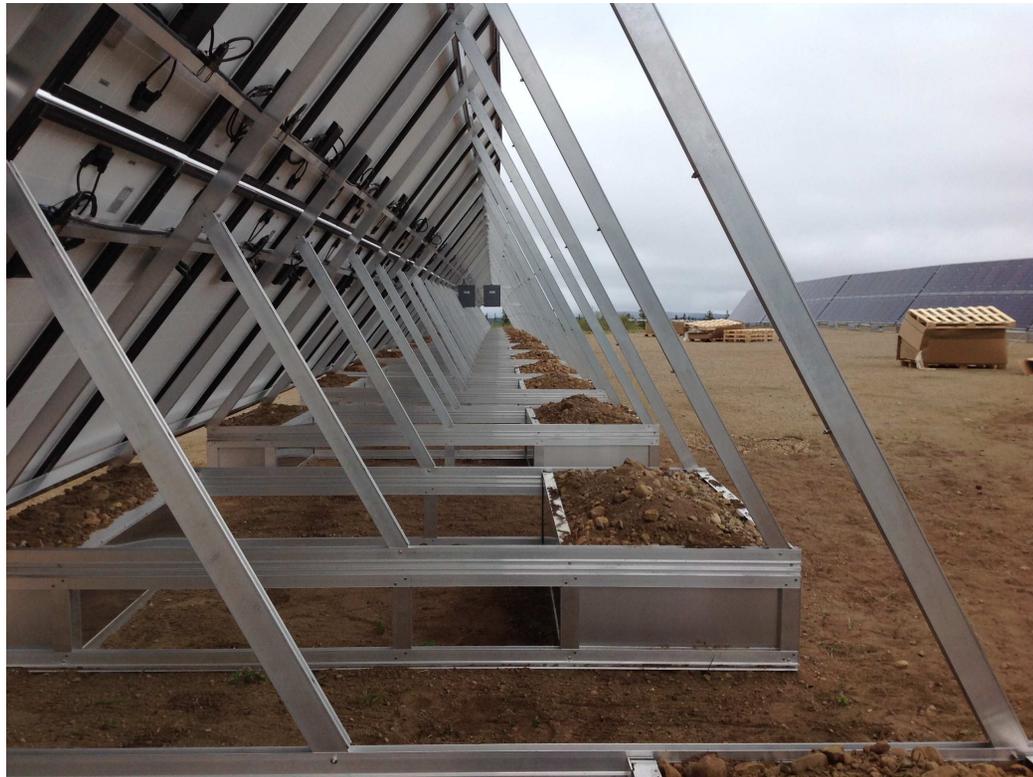
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Renewable Energy Systems

example Colville Lake NT



very easy to move, position and align before the ballast pans are filled
position fixed once the ballast has been added
module angle designed and optimized for the location

www.GreenSunRising.com





Renewable Energy Systems

example Colville Lake NT



module fasteners all front accessible; C-clips snap-fit in place;
one allen key for fast module installation; premium installation quality
by fastener design (automatic spacing)

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Renewable Energy Systems

82 kW solar system installation in 10 working days



system AC combiner panel and utility disconnect switch
durable stand made from aluminum and stainless steel

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back view of the utility connection point (up the pole)



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custom designed and built crates for the solar materials, as well as a special crate as tool crate and also serving as a kitchenette; cable reel built into crate; over 15 tons of material shipped via the winter ice road



www.GreenSunRising.com





Renewable Energy Systems

clean and well organized job site



www.GreenSunRising.com





Renewable Energy Systems

60 kW AC Hay River NT - Whispering Willows Senior Residence



roof-top mounted on a metal roof – one larger South and one smaller West facing array

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South facing array – overlooking the river



mounts4solar mounting system with stainless steel hanger bolts for attachment to the roof trusses.

www.GreenSunRising.com





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240 units of 250W solar modules, total 60 kW DC

www.GreenSunRising.com





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maximum system size by filling up the suitable roof sections



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snow fence to protect against snow avalanches



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panoramic view of the South array



installed, inspected and grid-connected in 9 working days

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Renewable Energy Systems

inverter start-up after safety inspection and grid connection



5 units of 11.2 kW AC 208V 3-phase inverters, total 57 kW AC

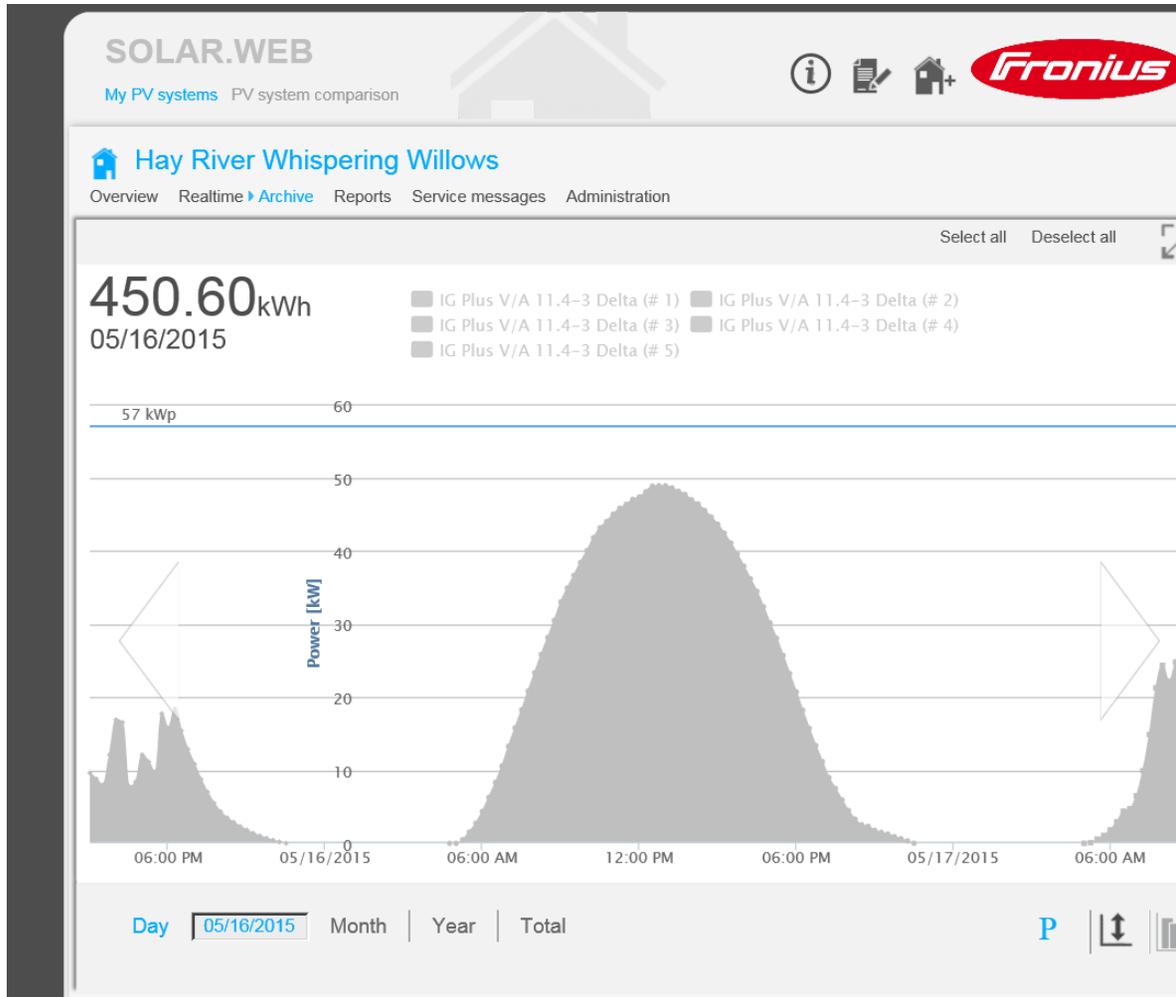
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internet based monitoring for the solar system



www.GreenSunRising.com





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4. Solar PV for off-grid Systems:



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4. deployable solar PV off-grid Systems – energy cabin



deployable system with 2-collector solar thermal system 300 l solar tank and 4.4 kW AC solar off-grid power 120VAC and 240VAC; built in battery bank 28 kWh rated capacity; ESA inspected, ready to go



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5. Solar off-grid systems for autonomous illumination



larger illumination systems:
500 WDC with 2 x 18W LED flood lights
At Highway 401 for highway sign
illumination, in two places



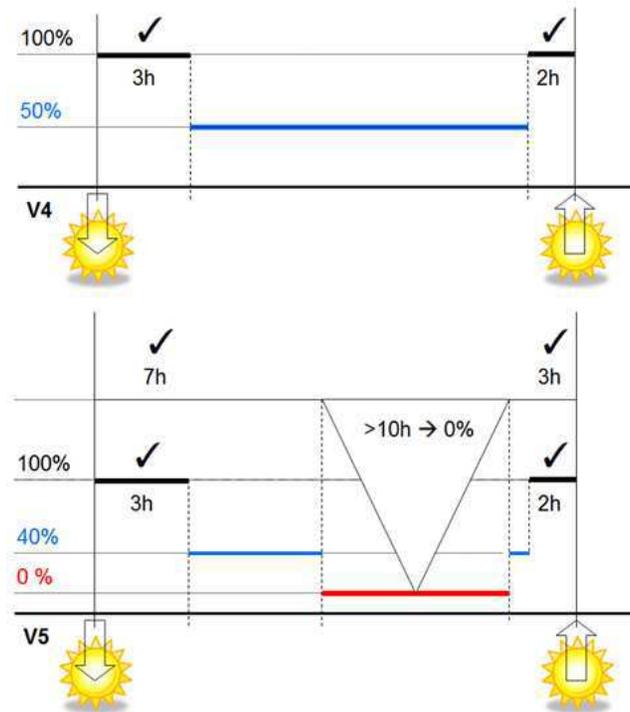
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5. Solar off-grid systems for autonomous illumination



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5. examples solar thermal, EVs





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RET-Center in Windsor



David Suzuki visiting
RET-Center Windsor
1680 Kildare Road
Windsor ON
www.RET-Center.com
519-946-0408





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6. Questions & Answers

The Solvis - Zero Emissions Factory - lasting climate protection.



RET-Center Windsor
(previous Windsor Tool
& Die Factory)
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Windsor ON
www.RET-Center.com
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