Living City Campus

@The Kortright Centre

A place that initiates, inspires, supports & monitors change toward sustainable living, through the use of sustainable technologies, practices, education and market transformation.

TORONTO AND REGION Conservation
for The Living City

Living City Campus @Kortright

- One of Canada's Largest Environmental Education Centres
- Most comprehensive educational demonstrations on sustainable technologies
- 25 years of award- winning environmental and energy education programs
- 85,000 engaged students and 40,000 public visitors

Education,
Training,
Data Collection,
Evaluation,
Demonstration.

www.sustainabletechnologies.ca

www.solarcitypartnership.ca

www.sustainablehouse.ca

www.kortright.org

www.pvpv.ca

Experienced Staff

A unique small group of experts with over 75 years experience in solar PV, thermal & wind energy.

Not just our job, it's our passion!

Canada's First!

Test Data

March 30 1982 Tested by - NRC	August 17 2010 Tested by - Kortright
31.66 watts	29.7 watts

Time in service = 28 years

Decrease since new = 6.19%

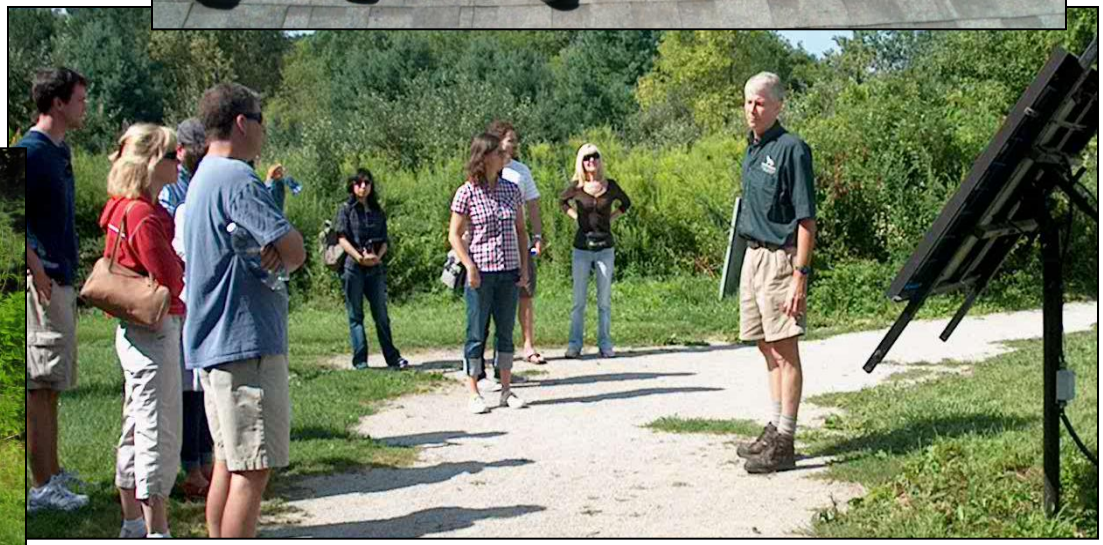
Decrease per year = 0.221%

Public workshops & education

- Sustainable technology workshops since the late1980s

- College & University partnerships.

- Corporate training.



The Green Energy Act

- Introduced in 2009 & pays up to $0.802* for solar generated electricity.

- Since the introduction more than ***42,905*** MicroFit applications have been submitted.

- As of October 2011, ***8,128*** systems have been activated.

Micro FIT,
What are the fees for electrical inspection?

- $260.00 - if installed by a Licensed Electrical Contractor (LEC)
- $416.00 - if installed by the property owner
- If the installation involves the services of an unlicensed PV installer and an LEC (for the branch wiring) the fee is $260 for the PV installer plus $260 for the LEC

Challenges for Educational facilities

- **Instructors**
- **Curriculum**
- **Fast pace of technological change**
- **Many institutions entering at the same time**

Instructors

- There is a rapid increase in demand for experienced people in the industry
- It is becoming increasingly difficult to retain instructors who are experienced
- We need more instructors, but it will be a challenge to hold onto the ones we have
- There is a need for a training facility for instructors, we will need to provide further training to existing instructors in other related fields.
- This training facility will need to be attractive to retain its own staff, possibly by conducting research
- The instructors will come from related trades, but these trades are also in demand

Curriculum

- Much of what makes up the solar trade can be gleaned from a multitude of conventional trades
- There is however a great deal of specialized knowledge involved in particular aspects
- This knowledge has been gathered by those with experience rather than having been taught in a conventional educational setting
- This is why experienced instructors are imperative at this time
- Excellent training materials are available from other markets but translation may be necessary
- Foreign materials must be localized, as our building techniques and materials differ greatly from European
- Canadian codes must also be integrated into the material

Fast pace of technological change

- Renewable energy equipment is capital intensive
- The pace of change is very rapid
- New equipment will be obsolete in a short time span
- A central facility for hands on training could spread the cost of equipment among various institutions
- The central facility could also provide experienced instructors and a place for curriculum development
- It would also provide a central location for manufactures to support
- And could have the excellent knowledge base to support research into new technologies
- This research would help retain quality instructors
- An alliance with Universities could help bridge the gap between real world knowledge and theoretical science

- **Selected skills required for a solar PV installation**
  - **Electrician**
    - **All wiring and conduit installation, special knowledge of PV circuits**
  - **Instrumentation**
    - **The PV monitoring system may be integrated with the Building Automation System, or connected to remote monitoring system**
  - **Steeple Jack**
    - **The PV modules often racked may need to be installed on a 45 degree pitched steel roof two stories up**
  - **Assembly**
    - **Mechanical assembly of the module racking system requires accurate layout of attachment points and assebly as prescribed by the structural engineering drawings**
  - **Roofer**
    - **Roof penetrations must be sealed, roof jack, and scaffolding used**
  - **Framer**
    - **Roof trusses must be reinforced to accept additional loading**
  - **Millwright**
    - **Assembling heavy trackers require rigging skills, foundation lay out and rebar assembly, concrete forming, and poring.**

- **A “perfect storm” of safety concerns confront a residential new construction Grid Tied PV installer**
  - **All the normal construction hazards**
    - **Working around heavy equipment**
    - **Work at heights**
    - **Lifting large heavy objects by hand**
    - **Using lifting equipment**
    - **Electrocution hazard from over head wires while on roof**
  - **Plus some hazards unique to PV**
    - **Installing live electrical equipment**
      - **PV modules turn “ON” as soon as they are exposed to light**
    - **Ground faults are not de-energized by GFI detectors**
    - **Most short circuit faults do not cause the fuse to open**
    - **Fuses may fail to clear a short when a reversed polarity string is connected in parallel to other strings**
- **Specialized safety training is required**

Professional Training

- PV theory
- Site Assessment
- PV Installation – Grid Tie
- Off Grid micro system
- Green Energy Act - Micro FiT
- Kortright Sustainable House Tour

PVPV

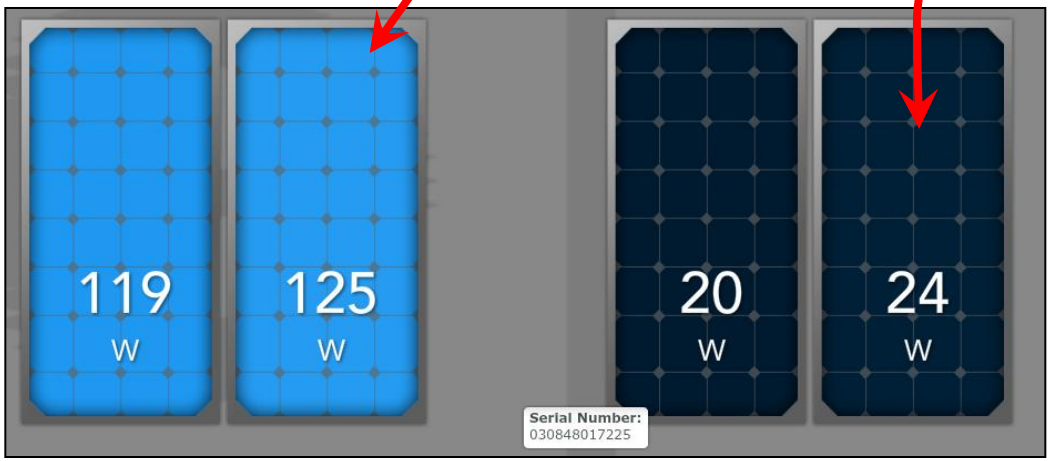
Photovoltaic Performance Verification

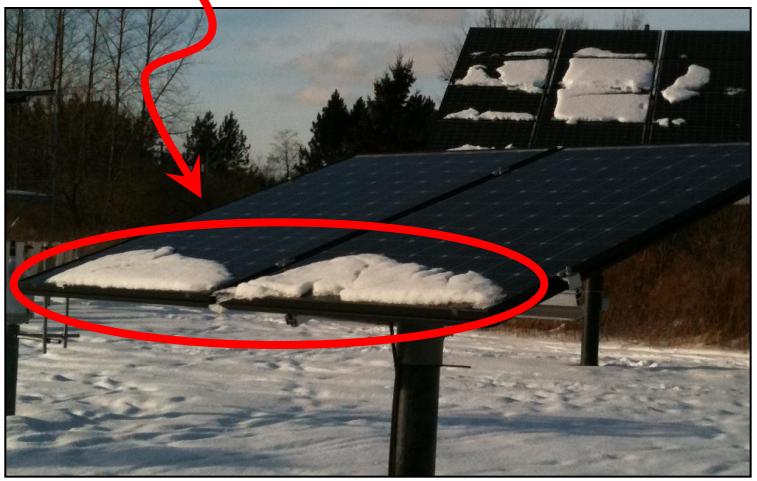
- Energy yield of Ontario made modules.

- An Oranges to Oranges comparison.

Snow Study

The effects of tilt angle & snow





http://enlighten.enphaseenergy.com/public/systems/uhYK12095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Thermal Events

in Ontario

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Kortright Centre
Toronto and Region Conservation Authority

Partnerships & Associations