Solar Water Heating
Value For
Today’s Consumer

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ECO Smart Energy Fair

Jeff Knapp
REDI Senior Officer
NRCan
11-B6, 580 Booth St.
Tel: (613) 996-8632
Fax: (613) 995-8343
jknapp@nrcan.gc.ca
Renewable Energy
Jeff’s Context

- Symphony Conducting (Queen’s)
- Engineering Physics (Carleton)
- Music & Science Educator (18 years)
- NRCan’s Renewable Energy “Evangelist” (2001-present)
Overview

- **SDHW: What is it & how does it work?**
  - Types of systems available
  - Technological functioning
  - Maintenance
  - New systems entering the marketplace

- **Government support programs for SDHW**
  - REDI Demonstration Project ‘Scheme’
  - Buyers’ Group Concept
  - Energuide for Houses
  - The 1-Ton Challenge
  - Ontario’s Sales Tax Rebate for Solar

- **Solar Economics**
  - Calculate your savings
Solar Domestic Hot Water Systems:

What Are They? & How Do They Work?
Types of SDHW Systems

• **Traditional Systems**
  – Evacuated Tube
  – Glazed
  – Unglazed Seasonal (pool)

• **New Systems**
  – “Solar Spar” by Menova Engineering
  – Air on Water System by Cansolair

• **CANSIA** for list of manufacturers and suppliers
  [www.cansia.ca](http://www.cansia.ca)
Traditional Systems

- **Solar Water Heating:**
  - Preheats domestic water for space heating, bathing, cleaning, etc.
    - Evacuated tubes
      - Highly efficient / relatively high first cost
    - Glazed flat plate collectors
      - Supply temperatures of +50°C at -20°C (ambient) are typical in Canada!
    - Unglazed polymer panels
      - “Seasonal” use in Canada
      - Very cost effective
      - Carwash in Markham
Collecting Solar Energy for Flat Plate Collectors
Typical Propylene Glycol Protected DHW System
Drainback Systems

Schematic of a typical solar hot water system with an electrically heated auxiliary tank
Solar System Maintenance

- Flush reservoir tank and heat exchanger annually *(Enerworks’ innovation)*

- Change propylene glycol biennially (once every two years)

- Top-up drainback system twice each summer (about one gallon each time)
Solar Concentrators

**“Power Spar”**

- Use lenses or reflectors to concentrate insolation over a small area
- Reduced losses
- Higher temperatures
- Higher efficiency
- Heats air or water
- Produces PV electricity
Cansolair Solar Air Heater

- Air heating panel mounts on south wall of building
- Heats air and/or water
Government Support Programs for SDHW
“The REDI Program”
(Renewable Energy Deployment Initiative)

www.nrcan.gc.ca/redi

◆ **Purpose:**
  - Reduce GHG emissions, mitigate climate change by stimulating market demand for solar, biomass and ground source heat pump renewable energy (RE) technology in the Industrial, Commercial and Institutional sectors

◆ **Status:**
  - Awaiting Ministerial approval for extension to March 2007 ($25M earmarked)
REDI Incentive Funding

- **Offsets RE Project Costs**
  
  - 25% for ICI sectors
  
  - Historically, up to 50% in Demonstration Projects

- Toronto & Peterborough examples

- Join the ECO Buyers’ Group !!
Toronto & Peterborough Demonstrations “S-2000”

- 26 in Toronto + 20 in Peterborough
- $4000 system cost - 50% REDI rebate
- 10-12 GJ delivered energy / year / system
  - = 3000 kWh / year @ 12¢ /kWh
  - = $400 / year in energy savings
- Payback Period? (current pricing, fuel price increases,)
- Return on Investment?
- Ontario Retail Sales Tax Rebate of 3.4%
State of the Standards: Are we “Certifiable”?

- CAN/CSA-F379 is being updated and harmonized with EU and US standards (to be published Dec. 2004)

- NSTF is becoming an accredited certification facility (by June 2004)

- Interim certification procedure to be in place by June 2004
Energuide for Houses & 1-Ton Challenge

- Grant ranges from $116 - $3348
- NRCan tests your home
- You do energy efficiency retrofitting
- NRCan retests your home

- Homes produce about 5 tons of GHG emission / year
- Reduce yours by 20% (by ... say ... installing a SDHW system!)
Calculate Your Solar Savings

• 20% of your home’s energy consumption goes into heating water

• Go to www.enerworks.com
  – Solar Calculator

• Go to www.retscreen.net
  – For the seriously ambitious

• Use the NRCan Formula and Buyer’s Guide
  – Call Jeff for details, 613-996-8632
  – includes conversions per fuel being displaced
Need Additional REDI Information ???

Jeff Knapp: (613) 996-8632
jknapp@nrcan.gc.ca