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# ECO Smart Energy Fair



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Solar Water Heating

Value For

Today's Consumer



Natural Resources  
Canada

Ressources naturelles  
Canada

Canada

# Renewable Energy



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# Jeff's Context



- **Symphony Conducting (Queen's)**
- **Engineering Physics (Carleton)**
- **Music & Science Educator (18 years)**
- **Stonecrest Institute for Energy Efficiency (1998-2001)**
- **Stonecrest Energy Solutions (2000-2002)**
- **NRCan's Renewable Energy "Evangelist" (2001-present)**



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# 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?



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# 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**

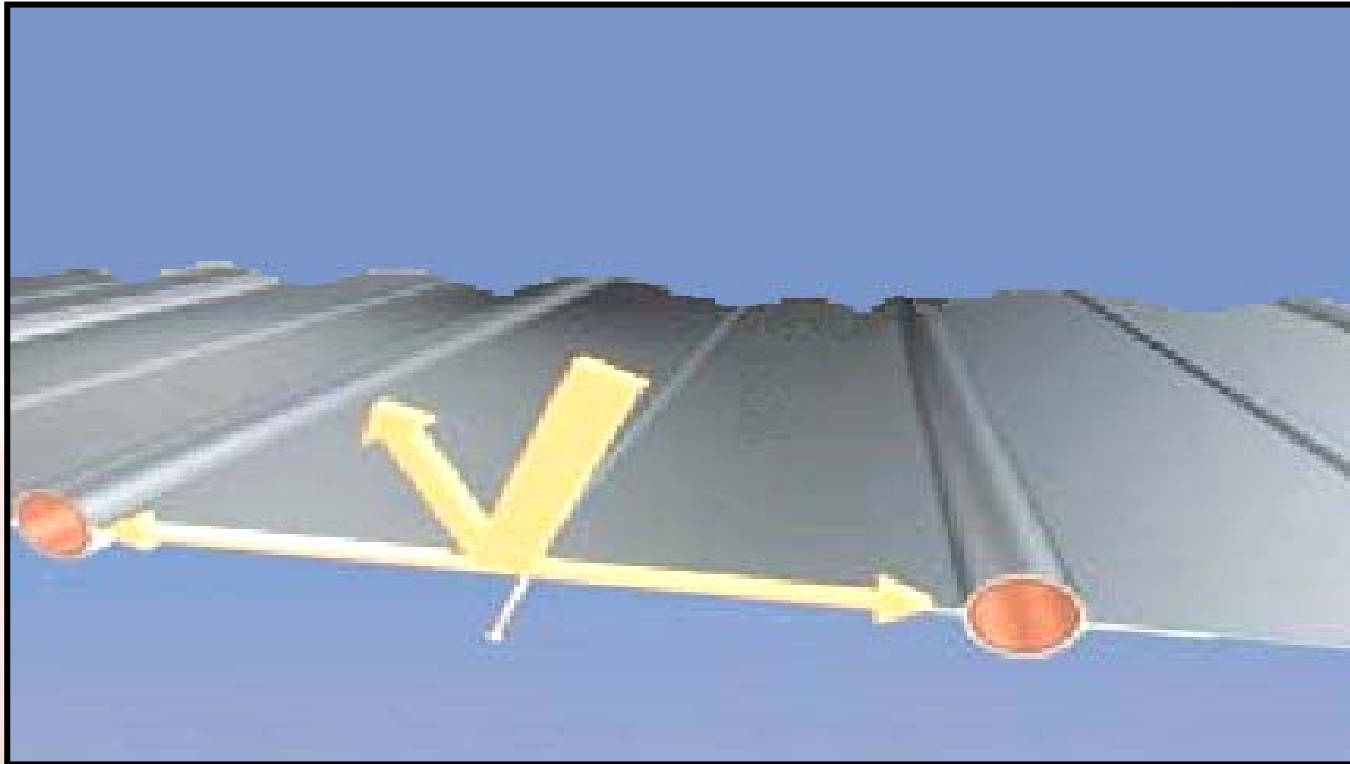
➤ “Seasonal” use in Canada

➤ Very cost effective

➤ Carwash in Markham

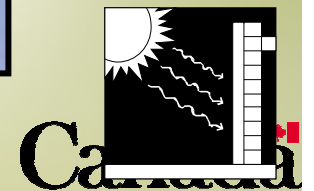


# Collecting Solar Energy for Flat Plate Collectors



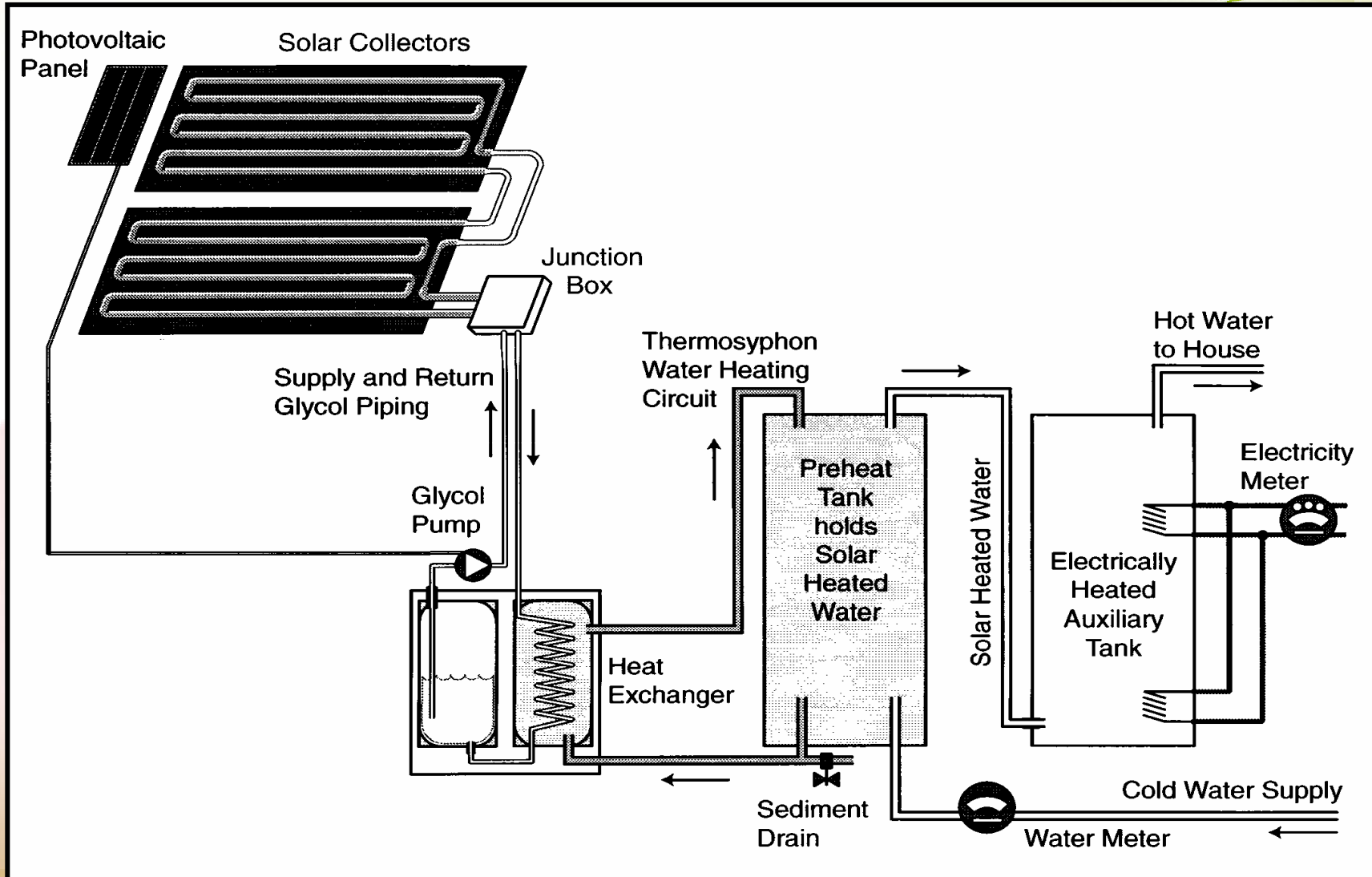
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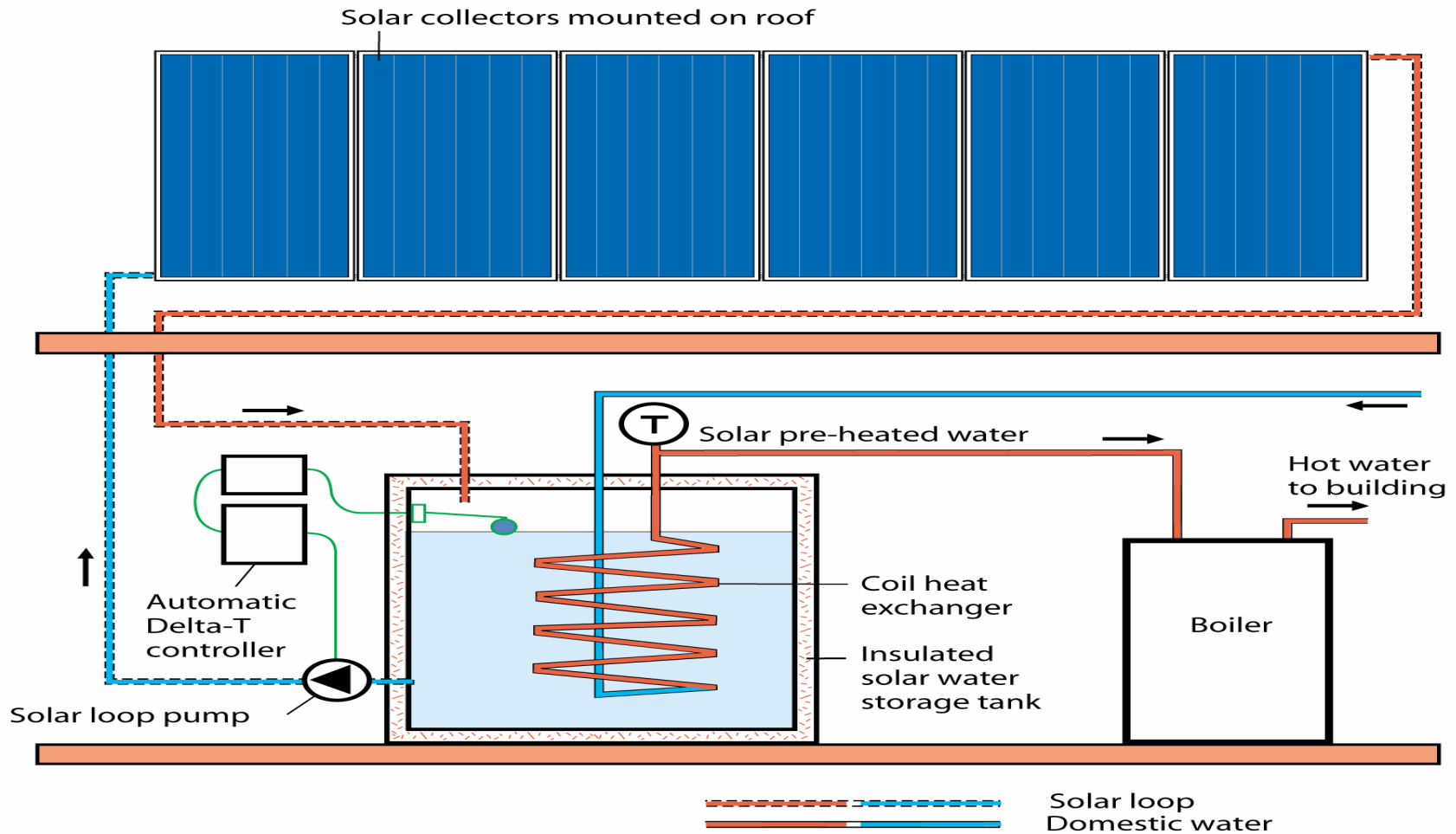




# Typical Propylene Glycol Protected DHW System



# Drainback Systems



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



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# 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



Solar Heat, Hot Water and Electricity  
for Everyday and Emergency Use



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# Cansolair Solar Air Heater



- Air heating panel mounts on south wall of building
- Heats air and/or water



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# Government Support Programs for SDHW



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# “The REDI Program”

(Renewable Energy Deployment Initiative)



[www.nrcan.gc.ca/redi](http://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)



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# 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](http://www.enerworks.com)**
  - Solar Calculator
- **Go to [www.retscreen.net](http://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 ???**

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