

Transpired Solar Collectors

Overview

A transpired solar collector is a supplementary ventilation air heating system which pre-heats outdoor air being drawn into a building. The system consists of darkly-coloured metal cladding that has been perforated with small holes (0.8 – 1.6 mm), fans and supplemental ducting. The cladding (referred to as the solar absorber) is mounted on the exterior wall of the building and encloses an air cavity. Solar radiation striking the darkly-coloured solar absorber creates a thin film of heated air on the exterior surface of the cladding. This air is drawn through holes in the cladding by fans, which create a negative pressure in the wall cavity, and ducted to the building's main ventilation system. Under ideal conditions, increases in supplied air temperatures on a sunny day can be expected to be 10°C to 17°C above ambient temperatures. The south wall is the optimum place for the system; however, it can still be valuable on the east and west elevations or a sloped roof. System sizing is driven by the building's fresh air requirements. The system does not reduce the size of the conventional HVAC system, but reduces the energy required to heat outdoor air by taking advantage of solar pre-heating.

Advantages

- Reduced heating and cooling costs
- Installs much like conventional metal cladding
- Captures heat escaping through walls

Savings

Case studies published by product manufacturers, industry organizations and government websites cite energy savings from transpired solar collectors typically offset construction costs in three years. As a comparison, a preliminary analysis using the RETScreen Solar Air Heating software was conducted on a hypothetical 300,000 sq. ft. warehouse in the Toronto area, clad with a 9,000 sq. ft. transpired solar collector on the south-facing wall. Factoring in the cost of conventional metal cladding and a government rebate for 25% of the system costs, the simple payback is four years.



Green Development Program

Creating solid partnerships with the development community is part of the natural course of business.

The Town of Caledon's **Green Development Program** strengthens that link. By providing development charge discounts for new green commercial and industrial buildings, the Town of Caledon enables developers to create more sustainable projects in our community.

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To learn more about our Green Development Program, contact the Economic Development & Communications Department

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Suppliers | Contacts

Building Green "GreenSpec" Directory | www.buildinggreen.com

Products qualifying for the ecoENERGY incentive program | <http://ecoaction.gc.ca/ecoenergy-ecoenergie/heat-chauffage/collectors-capteurs-eng.cfm>

Case Studies | Examples of Technology in Use

Enbridge Consumers Gas, Toronto, ON

In 1999, Enbridge Consumer Gas installed a solar heating system in a vehicle repair facility. The system saves the facility 11,000 m³ of natural gas each year; which translates into a reduction in carbon dioxide emissions by 20 tonnes. The solar heating system raised the average temperature of the building's incoming air by 9°C which translated into \$5,000 - \$6,000 of energy savings.

Beaulieu Canada, Farnham, QC

In 1998, Beaulieu – one of Canada's largest manufacturers of rugs, carpets and yarn – installed a solar air heating system in a new warehouse at Farnham. The warehouse has 15 large docking bays and a 10.5 m ceiling, and the company was looking for a system that could heat large volumes of incoming air and de-stratify heat build-up near the roof. The capital cost for the system at Farnham was \$175,000, of which 25% was contributed by the Renewable Energy Deployment Initiative (no longer active – see below for the ecoEnergy program which replaced it). After the first complete winter of using the technology, the company saved an estimated \$35,000 - \$50,000 on annual heating costs.

Government Incentives

ecoEnergy for Renewable Heat

<http://ecoaction.gc.ca/ecoenergy-ecoenergie/heat-chauffage/index-eng.cfm>

This federal program, which runs from April 1, 2007 to March 31, 2011, offers incentives to the industrial/commercial/institutional sector to install active energy-efficient solar air and/or water heating systems. The incentive will rebate 25% of the purchase, installation and certain other costs of qualifying systems, up to a maximum of \$80,000 per installation.