



**Northwest
Renewable
Energy** CORP

Innovating Green Technology
NWREC.us

If your building has a roof and AC the SunCooler can save you energy and money

REDUCE the cost of cooling your drop ceiling buildings!

Nearly all companies are searching for ways to reduce their energy consumption. Energy loss through inefficiencies cost the commercial sector untold millions of dollars every year.

One often overlooked area of energy in-efficiency is with the cooling needs of drop ceiling structures.

North West Renewable Energy Corp (NWREC) has developed a way for building owners to reduce their cooling loads to cool radiative and conductive heat generated by the sun. Solar radiative and conductive heat is transferred through roof structures into the attic spaces above the drop ceiling and on into the air conditioned space below because heat transfer naturally migrates towards lower or cooler temperatures.

NWREC's efforts have been directed at increasing the energy efficiency of cooling drop ceiling structures. In particular, structures that already have a "Cool Roof" roofing surface installed. Structures that do not have a "Cool Roof" will see even greater energy savings.

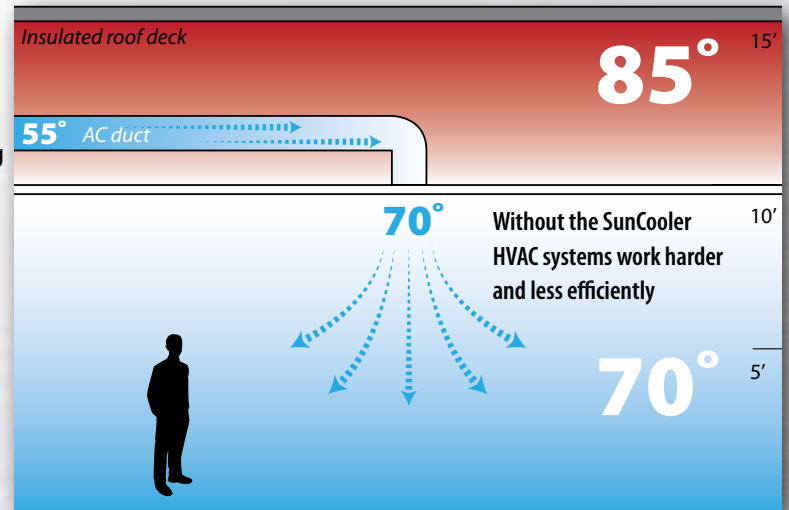
"Cool Roof" structures can see significant energy savings by removing the heat gain transferred through the roof structure components into the attic space. The space in which the HVAC ducting is located.

Nearly all drop ceiling structures that serve large commercial purposes are air conditioned. National retail and fast-food chains such as Target, McDonald's, Kohl's, Burger King, J.C. Penney Co., KFC etc... all operate facilities with a drop ceiling design as well as some with an open truss ceiling design. These drop ceiling facilities are designed with the HVAC ducting ran just above the acoustical drop ceiling. The outside surfaces of the ducting are subjected to higher temperatures in the attic space. The temperature of the room below may be maintained at 68-72°F degrees while the temperatures in the attic space above the drop ceiling line can easily reach into the 80's and higher as you get closer to the underside of the roof deck. For structures without a "Cool Roof" surface, temperatures can rise to above 100°F degrees.

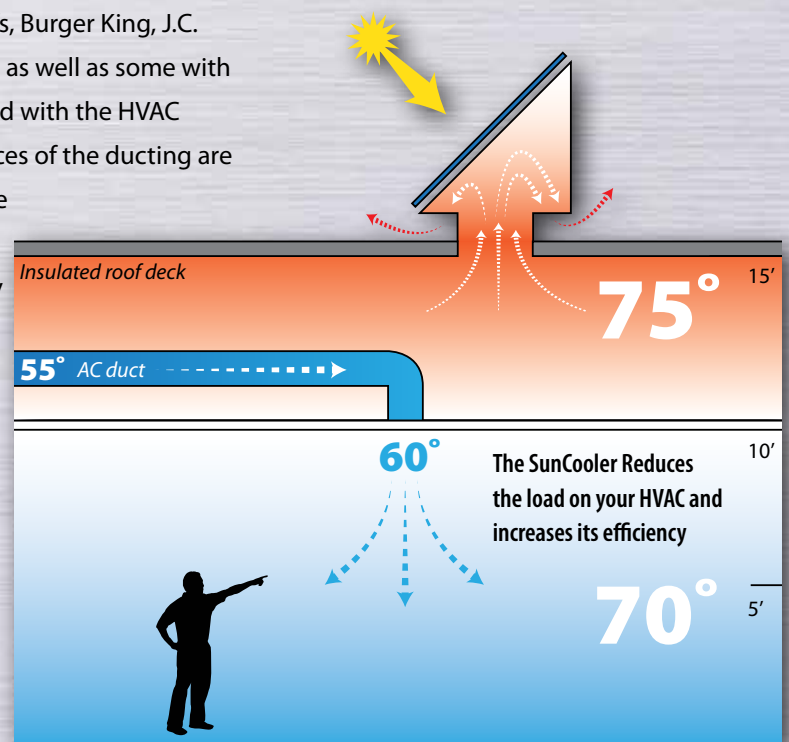
See the "Warm Thermal layer" illustrations on the right.



Energy savings can be realized by removing heat from the attic spaces above the drop ceiling line. The higher you rise towards the roof deck ceiling, naturally the warmer the air temperature



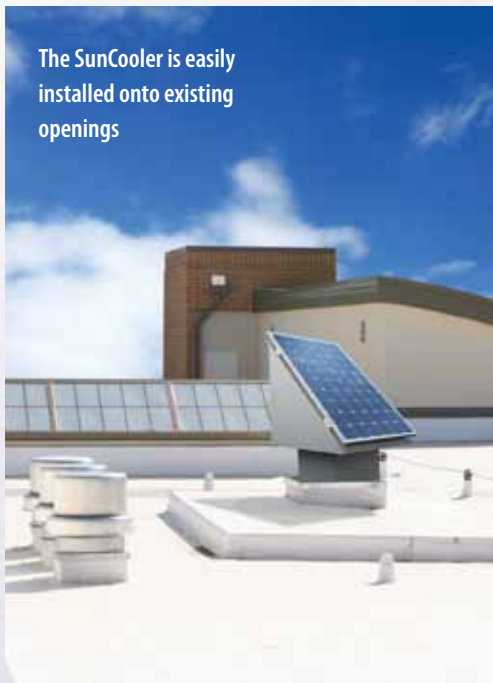
By removing the warm air pockets that are continually generated throughout the day light hours, energy savings of up to 20% or more can be realized through a reduction in the energy load required for cooling.



becomes, this is affected by several factors, conductive heat transfer, radiative heat transfer, improper ventilation, heat rising into the attic space from in store equipment such as refrigeration equipment motors, motorized displays, lighting, human activity, food preparation equipment and heat gain transferred through the roof deck.

The air conditioning equipment continually works against the warming temperatures generated from heat transferred through the roof structure. Conditioned air flows through the ducting at 55°F or higher. When the attic temperatures are lowered, less energy is required to maintain the desired cooled environment throughout the entire facility. This is due to less cooling energy loss through the HVAC ducting which directly translates into energy dollars saved.

Several national laboratories estimate that by removing the warm/hot air continually generated throughout the day light times within the attic space above the drop ceiling, energy savings of up to 20% or more can be realized through a reduction in the energy load required for cooling. Please refer to the attached document "The Need for Forced Ventilation in Commercial and Industrial Buildings" report, for further specific information on the energy losses due to HVAC ducting in hot attic spaces. Buildings located in hotter climates can see more savings than a similar facility in a cooler climate. Significant energy savings potential exists for all facilities in all climates that employ a forced ventilation removal process. See the attached SunCooler brochure for unit details and specifications.



The SunCooler is easily installed onto existing openings

SunCooler units are designed, engineered and manufactured in Oregon. NWREC also uses Oregon made PV modules.

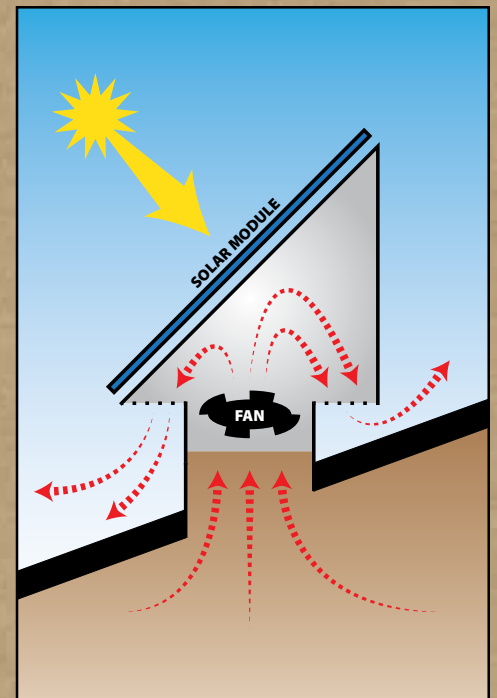
For further SunCooler product applications or general questions please contact NWREC at the contact information listed below.

This Drop Ceiling report was written by:
Jason Wright President & CEO

NWREC is the only company manufacturing solar powered ventilation products made specifically for institutional, commercial, industrial and agricultural applications.

- Powered by sun light, the SunCooler costs nothing to operate
- Easy "mount & walk away" installation by your roofing or HVAC contractor—no electrical permit, electrician, or electrical service needed
- Reduces your company's grid supplied energy usage
- LEED certification (use of the suncooler may qualify your building to earn points toward a LEED certification)
- Increase your building's LEED building performance (consult your local LEED certified engineering firm for LEED qualification details)
- Reduces the load on grid powered AC equipment—saving you money and extending the life of your HVAC equipment
- Visual proof with thermal imaging of the structure, before the SunCooler and after the SunCooler is available.
- SunCooler tax credits
(30% federal tax credit—consult your CPA)

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Here's how they work

The SunCooler operates when you need it... when the sun is out. Powered by the sun, the units draw out the hot attic air through an exhaust fan ventilation system. The units are self contained and are powered entirely by the sun. The SunCooler unit's run times can be regulated by optional temperature controls. Through forced ventilation, the attic temperatures can be lowered by 40F degrees or more. Thereby, reducing the cooling energy loss through the HVAC ducting resulting in tangible energy savings through more efficient HVAC operation.

For info on open truss ceilings, please Visit: nwrec.us



Engineered, Designed and Manufactured in Oregon

