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A REPORT ADVOCATING  
FOR SOCIALLY RESPONSIBLE  
SUSTAINABLE DEVELOPMENT

# VENTING SKYLIGHTS BRING THE OUTDOORS INSIDE FOR LAKE MICHIGAN HOME

## ENEREF INSTITUTE EXAMINES HOW SOLAR-POWERED VENTING SKYLIGHTS BRING IN FRESH AIR AND REDUCE HVAC LOAD

The single-story house, with 240 feet of prime footage facing Lake Michigan, was originally built in 1956 to serve as a goose hunting cabin.

Choosing to add on to the existing structure rather than demolish and

rebuild, the homeowners began extensive modifications and additions soon after purchasing the home.

The renovations included converting an existing 30' by 15' patio into an atrium. While the new atrium closed in the

# IF I HAVE THEM OPEN WHEN IT STARTS RAINING, THEY CLOSE ON THEIR OWN.

HOMEOWNER | *Commenting on the skylights*

patio, the homeowner wanted to maintain an open-air feel. This was achieved by incorporating skylights with an open ventilation system to take advantage of the airflow of the lakefront location.

“It was an outdoor patio prior to the project,” explains architect Jim Marriott. “We made a permanent structure out of it, but kept the same feel of the house.”

The homeowner added that since the view of the lake “is phenomenal,” they wanted the design of the atrium space to focus on the waterfront.

## CREATING A TRANSITION SPACE

“The homeowner wanted an indoor-to-outdoor transition space, with natural daylight but environmentally controlled,” said Marriott.

The homeowner added, “Inviting all the light in is like being part of the outside.”

The house sits on the western shore of Lake Michigan in Belgium, Wisconsin, an area that draws visitors from Milwaukee and Chicago. The prime location affords the lakeside homes an

unmatched view of the birds, trees and sandy beaches.

“It’s very open and uncongested,” said the homeowner.

As part of our Natural Interior Daylight initiative, Eneref Institute interviewed stakeholders involved with the project’s skylight design and installation: Dan Sturm, owner of Wisconsin Skylight Solutions; Jim Marriott, architect of James Marriott & Associates; Mike Pelant, contractor of Michael Thomas Development Inc; and the homeowner.

## A CEILING OF SKYLIGHTS

At the direction of the owners, the architect designed an atrium enclosed with a ceiling of skylights. The architect specified fourteen 4’ by 4’ curb-mounted, solar-powered venting VELUX skylights. The room also features a bank of sliding-glass doors and large windows.

“We went with so many skylights because we really wanted it to feel more like an outdoor space, but still be able to environmentally control it,” said architect Marriott. “We have a lot of cool, windy days on Lake

Michigan so this project makes it a year-round space.”

## CONTROLLED INDOOR ENVIRONMENT

The skylights helped achieve the owners’ vision of a transition space—an atrium integrated with the outdoors, while controlling the indoor environment.

“It makes the room look even more open and airy,” said the homeowner. “It makes you feel good to have all that light, and to be able to see the sky. You don’t feel so closed in.”

The skylights open—or vent—to allow for airflow throughout the interior of the home.

“You can open up the skylights. It makes a difference,” said the homeowner.

Due to a chimney effect, the open skylights draw fresh air though the windows and doors from the lake and cool the house. This minimizes the need for air conditioning.

According to general contractor Pelant, “They throw those skylights open and they’re in heaven. Your air conditioner is almost obsolete.”

## PROJECT PLANNING

While starting with a 1950s-era home did create some challenges for the architect and contractors,



**FACT**

## **THE SKYLIGHTS MINIMIZES THE NEED FOR AIR CONDITIONING.**

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## FOURTEEN SKYLIGHTS INSTALLED

*The renovation converted an existing 30' by 15' patio into an atrium space.*

the owners wanted to incorporate as much of the existing structure as possible. The home was purchased in the summer of 2013, and construction began the following spring. Architect Jim Marriott originally specified eight skylights for the atrium, but that number was increased to fourteen after the project began.

“When we got to the reality of building, we realized that we could fit more skylights in,” said the homeowner. “I was working more from a visual perspective and I thought the room could use it. It is a sunroom, so

putting more sun in was a positive aspect.”

And because the atrium is connected to the kitchen, “it’s an all-purpose area where everybody gathers,” said the homeowner. “It’s the main communal part of the house.”

“The space is something the property did not have before—it’s a striking space,” said architect Marriott.

### SKYLIGHTS FITTED WITH CUSTOM CURBS

The roof had a very low, nearly horizontal pitch of two inches and twelve inches. Architecturally,

Marriott wanted the design of the skylights to follow the angle of the roof, but he was concerned his design “might not work” at that shallow of a roof angle.

To solve the problem, custom curbs were built for each skylight. The custom curbs were fabricated by Wisconsin Skylight.

“I was very happy they were able to pull that off,” said Marriott. “The skylights follow the roof and look fantastic.”

While the complete renovation took nearly a year, the skylights themselves were installed in just two weeks.

# A 'GROUP 14 ENGINEERING' STUDY SHOWED VELUX VENTING SKYLIGHTS IMPROVED INDOOR AIR QUALITY

“Indoor air quality is significantly improved when VELUX venting skylights are used, leading to a very quick dilution of predictable indoor contaminant concentrations.”

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“Everything ran very smoothly; it exceeded everyone’s expectations,” said Sturm.

In order to withstand the constant wind and rainfall coming off the lake, watertight seals were a top priority.

“Each skylight comes with its own flashing kit that is designed to the size of the curb,” said Sturm. “The system also comes with an ice and water shield.”

After a year of exposure to the elements on Lake Michigan, Sturm conducted inspections of the skylight seals and verified their integrity.

## SKYLIGHT FEATURES

Solar-powered venting VELUX skylights were specified by the architect to provide both natural light and ventilation. The skylights can be easily programmed to open automatically at set times, while a handheld remote also allows manual control for ventilation.

Skylight openings are protected by preinstalled screens, and a rain sensor automatically closes them when rain is detected. They are powered by solar panels and open up to 14 inches.

“You can hit a button and watch fourteen skylights just magically start to open,” said contractor Mike Pelant. “Virtually the whole roof feels like it’s opening.”

The homeowner added, “And if I have them open when it starts raining, they close on their own.”

A 4” by 16” solar panel is mounted on the roof beneath each skylight, providing power to the venting motor via a small battery. When closed, the advanced Low E3 laminated Cardinal glass reduces unwanted outside noise by up to 25% more than standard double pane glass. VELUX provides a ten-year warranty on the solar panels and a ten-year “no-leak warranty” on the skylights.

## SOLAR POWER SAVED ON INSTALLATION COSTS

The solar panels eliminated the need for additional wiring and conduits.

“The fact that they were solar was fantastic,” said Pelant. “The electrician did not have to wire fourteen individual skylights, eliminating \$2,500 in cost.”

A federal tax credit, available to solar-powered venting skylights, saved the project an additional \$1,500.

“It’s worth getting solar-powered skylights for the rebate alone,” said Dan Sturm, owner of Wisconsin Skylight Solutions, the company that fabricated the custom curbs for the installation. “VELUX has charts online for homeowners to find their savings,” explained Sturm.

## SUNNY SPACE, HAPPY HOMEOWNERS

All of the stakeholders interviewed for this report were satisfied with the results.

Architect Jim Marriott said, “The owners are very happy. And I’m happy that they’re happy!”

“This project far exceeded my expectations—it had that ‘wow’ factor,” said Dan Sturm.

The homeowner said, “Everybody comments on it because of the openness and the daylight. And when the moon’s just in the right spot—it’s great.”

*Research and reporting compiled and provided by Eneref Institute. Additional information generously provided by VELUX USA, Wisconsin Skylight Solutions, James Marriott & Associates, Michael Thomas Development.*

The page features several decorative elements: a large grey circle at the top center, a smaller light blue circle to its left, and a circular inset image on the left showing two people in a brightly lit room. On the right side, a photograph shows a person in a dark jacket and a blue face mask walking through a modern building with a large glass skylight. The floor is highly reflective, showing the person's silhouette. The main headline is set against a dark grey background with an orange horizontal bar above it.

# LEAD BY EXAMPLE.

***THE NATURAL INTERIOR DAYLIGHT INITIATIVE IS A CAMPAIGN TO PRESERVE OUR NATURAL RESOURCES AND ENJOY NICER LIGHTING IN OUR HOMES AND BUILDINGS.***

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**TO ACCOMPLISH OUR MISSION**, Eneref Institute launched the Natural Interior Daylight initiative to champion solutions in line with our mission and deliver sound ideas to significant market influencers. The initiative is designed to encourage responsible behavior of public and private organizations, municipalities and corporations with common sense solutions that can achieve effective results.

Our Virtual Campus is the repository for our Advocacy Reports and Web Forums. **Visit [eneref.org](https://eneref.org).**

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