

# HOUSE ON LAKESIDE COURT DELIVERS SUSTAINABILITY, ENERGY EFFICIENCY



***“As environmental issues become more pressing, there are two possible responses: forget it and hope that government and corporations will figure it out, or take action yourself.”***

*Ed Begley Jr.*



***By installing energy-efficient equipment and Atlantis Energy Systems, Sunslates, the homeowner reduced the amount of energy needed for operations and occupants' comfort.***

**Advisory Partners:**

**Rockwell Assoc. Architecture  
Sturm Builders, Inc.  
Tor Faegre-Artist, Cabinet  
maker  
Solar Service, Inc.  
Mary Ann O'Meara  
Commonwealth Edison**



Conservation-oriented planning and design make sense in today's environment. For any building project, utilizing the resources of the site, incorporating green building materials, and relying on the sun and evening breezes for lighting and cooling are affordable options. Considering these opportunities early in the design process offers the greatest potential for realizing a truly sustainable building.

Atlantis Energy Systems designers collaborated on a project that incorporated these features: the Home of Eleanor and William Revelle, a new 4,000-square-foot home near Northwestern University in Evanston, IL. The 19,000 sq. ft. site on Lake

Michigan was built to high efficiency and environmental standards.

The design team lead by the owners determined from the beginning of the project to incorporate renewable energy systems as a key strategy for reducing the carbon footprint of the house. They focused in particular on including a photovoltaic system in order to demonstrate the feasibility of a PV system in the upper Midwest. The integrated PV roofing tiles (Sunslates) selected are both highly efficient and visually unobtrusive. A solar hot water system provides heat for domestic hot water and the radiant-floor heating system.



Several 4'x8' hot water solar collectors installed along the driveway provide much of the heat for the radiant-floor heating system.

### FOR MORE INFORMATION

about energy efficient, sustainable design & photovoltaics, call or e-mail Atlantis Energy Systems.



The Leading Edge Revelle house focuses on Energy Efficiency and Environmental conscious design as evident by all measures.

For example, FSC-certified wood was used for the framing, doors and window trim, cedar shingles, and the plethora of bookcases and storage units found through out the house. In addition, floor joists, structural beams and headers were made from engineered lumber. Finish material included bamboo used for flooring in all main rooms of the house. Forbo Marmoleum®, made with natural raw materials and having no adverse health issues either during production, it's useful life, or disposal was used in the hallways and laundry area. Regionally selected limestone from Minnesota was used for the flooring material at the front entry, mudroom, first-floor bathroom and the sunroom. The reclaimed Doug fir, from the original house's ridge beam was used for structural posts, mantle piece and for the top of the built-in buffet in the dining room. Recycled glass tiles were used for the kitchen backsplash, and recycled redwood paneling was used as siding for the exercise pool located in the finished basement. Lastly, a construction waste management plan was in place during demolition and construction.

Water efficiency and runoff reductions were achieved through the use of dual-flush (0.8/1.6 gallon) toilets, Low-flow showerheads & faucets, a water-efficient dishwasher and front-loading clothes washer.

To reduce runoff, the design team provided the homeowners with a driveway having two (2) distinct sections. The first, being composed of porous pavers atop an 18-inch-deep bed of fine gravel provides the permeability and strength needed. The second, grass pavers used for the parking apron. A 1,000 gal cistern was fed by the downspouts from which, water can be pumped to water the garden in dry summer months. A low berm was constructed along the south property line, raising the ground level where rainwater was said to pool and drain towards the lake after heavy storms. All of these site features reduced runoff to the lake significantly and recharges the water table used by other vegetation like trees and other plantings.

Now in operation for more than 3.5 years, Atlantis Energy Systems delivered 480 Sunslates rated at 13.3Wp/tile totaling 6.38kWp. The PV system is net metered and connected to the Commonwealth Edison grid, providing power to that grid during peak solar hours during the summer season. During the evening hours, the homeowner buybacks power from the utility. On a typical summer day, between 15-20 kWh of electricity are sold to Commonwealth Edison during the day and, 6-10 kWh are purchased in the evening. In the winter, approximately 4-8 kWh/day can be sold back to the utility. In addition to being "grid tied", a battery backup system has been installed reducing the overall efficiency of the system but providing the homeowner with 24 hour power for essential electrical loads and comfort and security in the event of future power outages or brown-outs.

### Installation

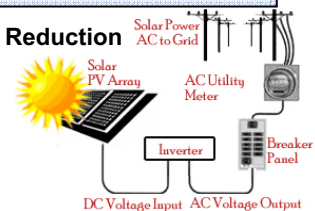
Ideal for both new construction and re-roofing, the complete SUNSLATES™ system is delivered to the job site. No special trades are necessary. Once trained, the roofer and electrician can handle the installation themselves:

- SUNSLATES™ are secured with stainless steel storm anchor hooks and anchored to 1x4 nailers resting on 2x2 sleepers.
- Each SUNSLATES™ tile comes with a proprietary gas-tight connector that wires each tile to the adjacent tile. With a simple twist of a special screwdriver-like tool (provided), locks and secures the SUNSLATES™ tile within its circuit.
- At the end of each course a "homerun" cable is run to a splice box on the underside of the roof deck. On new construction, the low voltage cable is run through wall bays to the inverter. Usually on re-roof construction it is run through conduit on the exterior wall through an eave.

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### Source Emission Reduction

SO<sub>2</sub> - 0.006 lbs  
 NO<sub>x</sub> - 0.004 lbs  
 CO<sub>2</sub> - 1,576.68 lbs



*Emissions reduction potential of a grid-connected PV system depends more on the characteristics of the regional electricity system than on the available solar resource. A detailed analysis of historical PV generation, fossil generation, and fossil emissions data for your region will have specific characteristics such as fuel portfolio and demand patterns that determine the magnitude of emission reductions. For this study extensive literature searches provided the basis of our emission reduction calculations.*

### Greenhouse Gas Avoided

CO<sub>2</sub> - 8,550 lbs

*According to the USEPA estimate (2003, 1.4lbs of CO<sub>2</sub> is released in the production of 1 kWh of electricity*

*This fact sheet was provided by A Design Consulting for Atlantis Energy Systems, Inc. and with the consultation of William & Eleanor Revelle. Photos by A Design Consulting and William & Eleanor Revelle.*