

# Welcome Home

SOUTHEASTERN WISCONSIN LIVING

QUINTESSENTIAL  
DESIGNS  
Geneva shoreline classics



Exploring shorepath  
architectural gems,  
from Renaissance  
revivals to quintessential  
Queen Annes



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# TALKIN' GREEN

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## Building a net zero energy home

Transportation in the U.S. uses an incredible amount of energy. But it's our buildings that are the biggest energy users (and wasters) in the USA. It makes sense that focusing on reducing the energy consumption of our homes and other buildings offers the greatest opportunity to reduce our nation's carbon footprint as well as our energy bills.

A net zero energy building takes many forms, but for the most part it means that on an annual basis, the building is capable of generating as much energy on site as it consumes, so in the end, its net energy consumption is ZERO. Some of the time the building is using electricity from the utility and other times it is producing excess energy that flows back to the utility grid. In 2007, the Energy Independence and Security Act set the goal that all new building construction after 2030 must be net zero. Although the number of existing housing and commercial buildings is obviously much larger than the number of new buildings constructed every year, nevertheless, by 2050 all existing buildings must be upgraded to Net Zero status too. So, the clock is ticking, and it's going to take a while - as some buildings will be upgraded but others will need to be replaced.

### Your Net Zero Project Team

First things first - all new buildings should be designed in order to reduce their basic energy consumption to the lowest level possible. Saving energy is always less expensive than adding on-site energy generation. Don't forget the human education factor too - teach behavior like turning off lights and computers when not in use. Then, examine all of the energy generation options that make it possible for the building to reach that net zero energy goal: wind, solar, geothermal, biomass, fuel cells and combined heat and power systems.

Developing that design calls for a Net Zero



Energy project team with experience in:

- building layout and orientation
- the building envelope (walls, windows, doors and roof)
- landscaping for controlling the impact of the sun and wind and reducing irrigation
- building materials for building a tight envelope
- thermal mass and geothermal HVAC systems
- lighting efficiency including use of natural light
- low flow plumbing fixtures including waste water (gray) reuse
- passive solar and natural ventilation

The Net Zero Energy builders of today are testing new ideas that will create the template for the future. Innovations will include things like geothermal HVAC utilities for heating and cooling for the entire community and the creation of community solar gardens.

As you begin to reach for your goal of building a Net Zero Energy Home, remember to keep these general guidelines in mind:

1. All of the specialists need to act as a team to integrate all of the building components,
2. The shape of your home should be more rectangular than square and position it along the east-west axis to maximize day lighting. This im-

proves the ability of using daylighting and solar.

3. Your building envelope needs to be energy tight and well insulated. The insulation R factors of 50 in the roof, 30 in the walls and 20 below grade should be planned at a minimum. An exterior insulation to reduce heat transfer through the framing is an important new method. Proper caulking, sealing and tight windows are a must with triple glazing with argon gas. You don't want cold air leaking in the winter or hot air in the summer.

4. Use HVAC systems such as geothermal heat pumps and consider hybrid designs to lower the upfront cost.

5. There are a lot of wireless and programmable controls and thermostats that you can control from your tablet or smart phone. These help you to monitor how your home is performing.

6. Watch for electricity waste due to "plug load creep". There are so many new electronic devices like cell phones, tablets, computers, and wide screen televisions that people leave in standby mode for instant on. Save energy by cutting the power when these devices are not in use.

Building Net Zero makes good economic sense for you, the local economy and the country. Whether you build new or retro an older building, the savings will be well worth it - and the clock is ticking...

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