SunHaven Carriage House

*Hi, my name is **Hap Haven***

I'm a Senior Outreach Manager for NJ's Residential New Construction program, and this is my home.

All-Electric Home (well, almost)

After the solar assist and the great protection from high performance windows, doors and structure, only a moderate addition of heating and cooling is necessary.

[10 -YEAR NUMBERS]

170,000 KWh or about $27,000 saved!

- The average Mid-Atlantic total home energy use is 105 million Btus or ~31,000 kWh per year for a 2,000 SF house.
- My use is, on avg, 21,000 KWh per year for a 3,000 SF house.
- Adjusting for house size, my savings are 17,000 kWh/yr x 10 years = 170,000 KWh (x >16 cents/KWh = $27,200.

What have I done to be Sustainable?

TOTALLY GREEN and SUSTAINABLE

Most everything is reused or recycled on site.

1 Reused or Recycled everything possible.

2 Bought non-toxic products.

3 Designed the house to take advantage of the site and sun

4 Bought the most energy efficient appliances I could afford.

NOT GREEN OR SUSTAINABLE

Most everything comes from off-site and is thrown away to the land fill.

1 Reuse or Recycle Everything Possible.

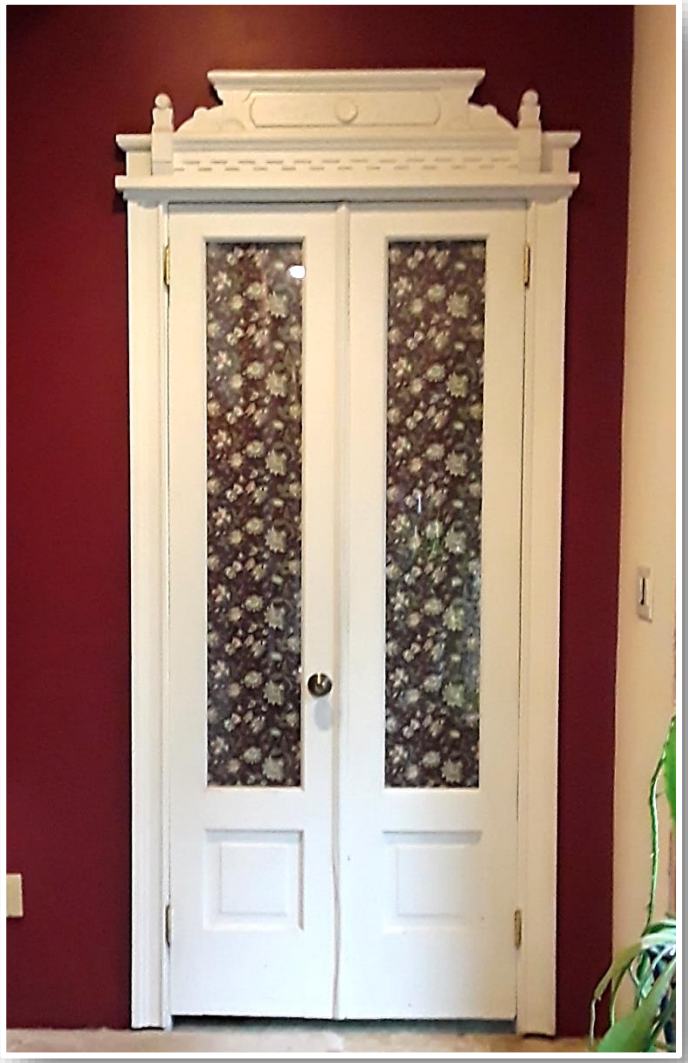
Reusing a house is recycling on a grand scale! The "greenest" home is the one that already exists by saving the **embedded carbon**.

And renovating a home gives the perfect opportunity to create a High-Performance Home.

Carriage House Reusing Overview

Salvaged Architectural Details

Reusing original carriage house details and other millwork add character to the house.



Recycled millwork

Salvaged Plant Material


Salvaging Black Locust - 1987

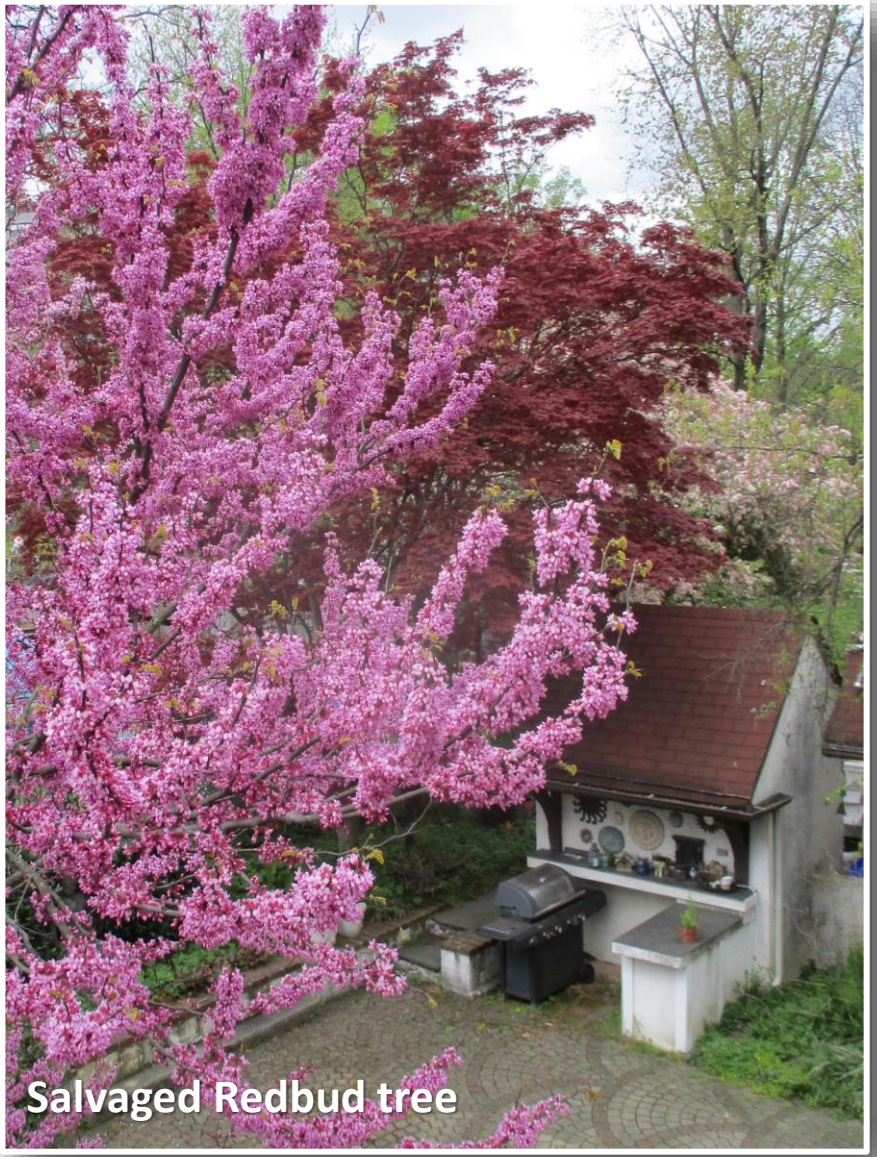

Black Locust today

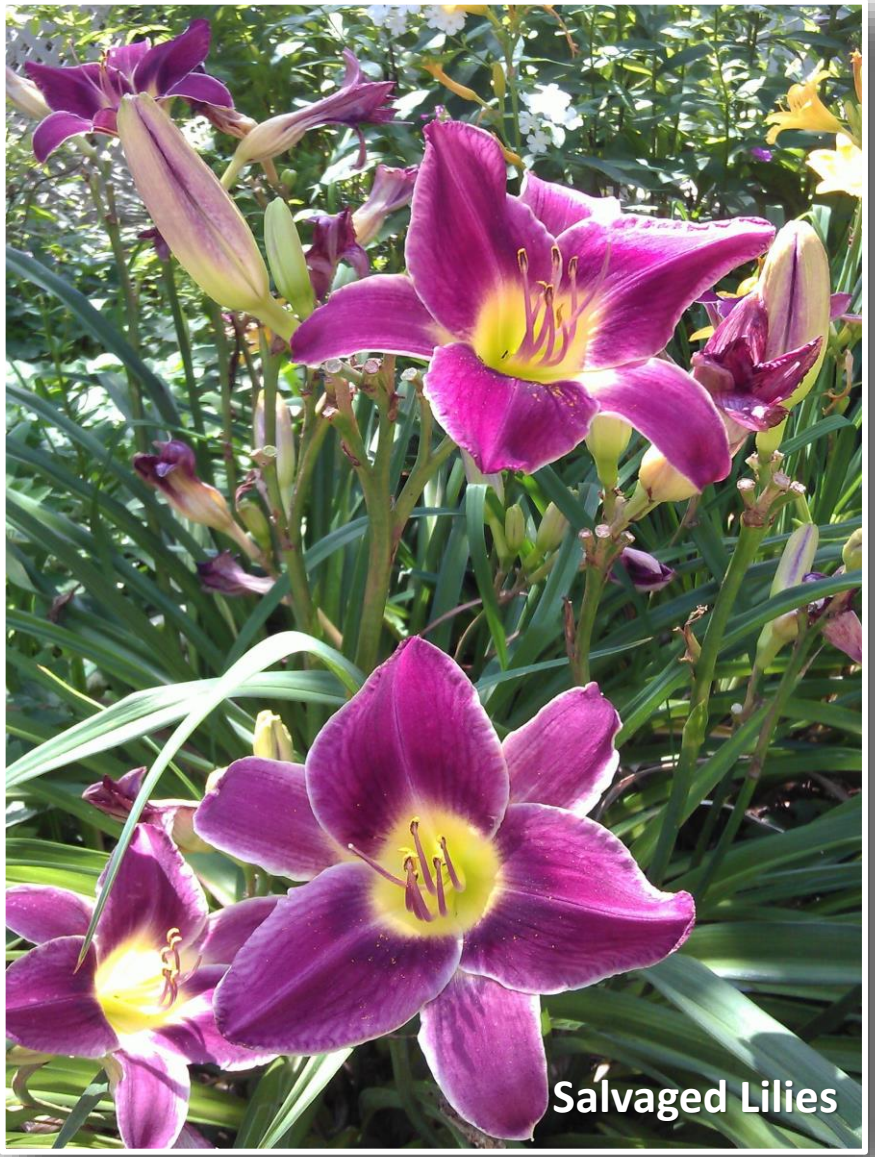
[THE NUMBERS]

REUSED PLANT MATERIAL

- Hundreds of perennials,
- 55 shrubs and
- 23 trees
- 300+ sf of Black Locust decking
- Firewood

Reusing Plants Can Be Beautiful


Salvaged Redbud tree


Salvaged Lilies

How About The Hardscaping?

- We recycled stone and brick for all your hardscaping needs
- Broken stone, brick, concrete and soil was used for clean fill and road base

[THE NUMBERS]

2,000+ SF. OF HARDSCAPING

That's brick and stone reused as a driveway, sidewalk, patio, walls and curbing.


Cage for storing rubble


Original demolition

Even Reusing a Tennis Court!

We cut the 3” asphalt into 16” x 24” blocks from an old tennis court to be reused as edging and pavers. Remember that reusing something saves the **energy / carbon** it took to make it, transport it and install it!

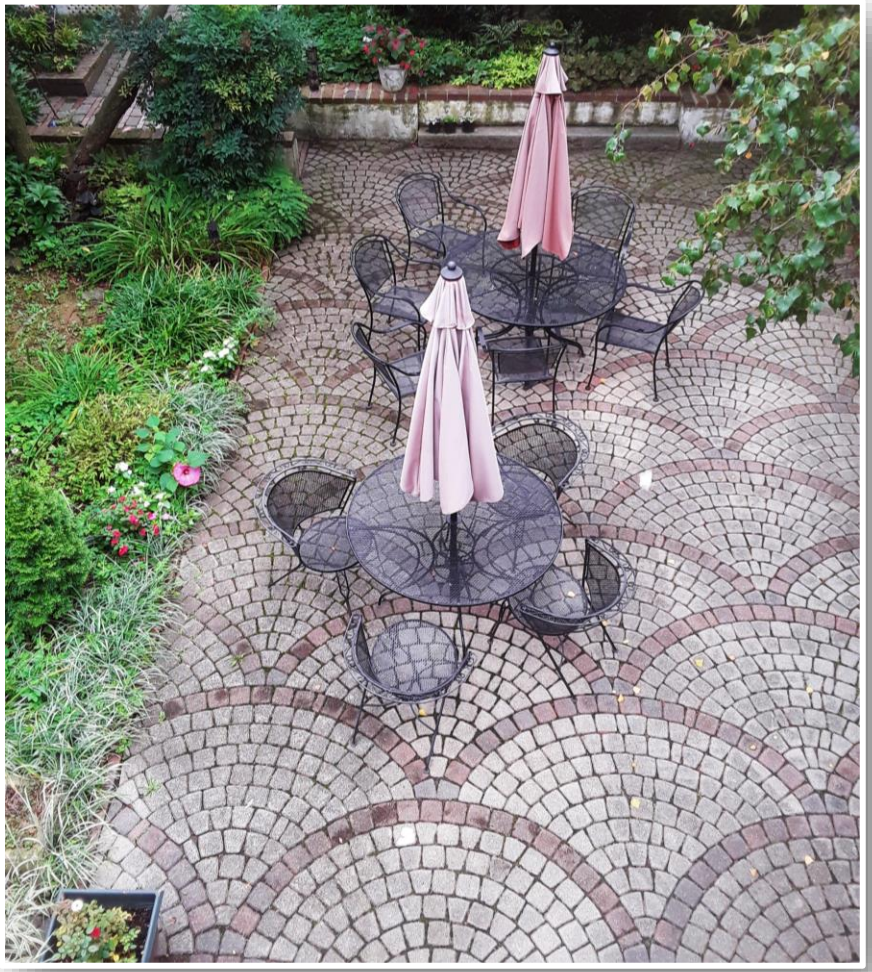
Asphalt pavers and salvaged brick edging

Asphalt tennis court cut for pavers

6 Water Storage and Recharge Systems

This rain barrel's overflow is connected to a rain garden.

Rainwater percolates through this patio, is collected and piped to our orchard.



Digesting Food Waste

Green Cone® food composter/digester

NO FOOD WASTE TO THE CURB

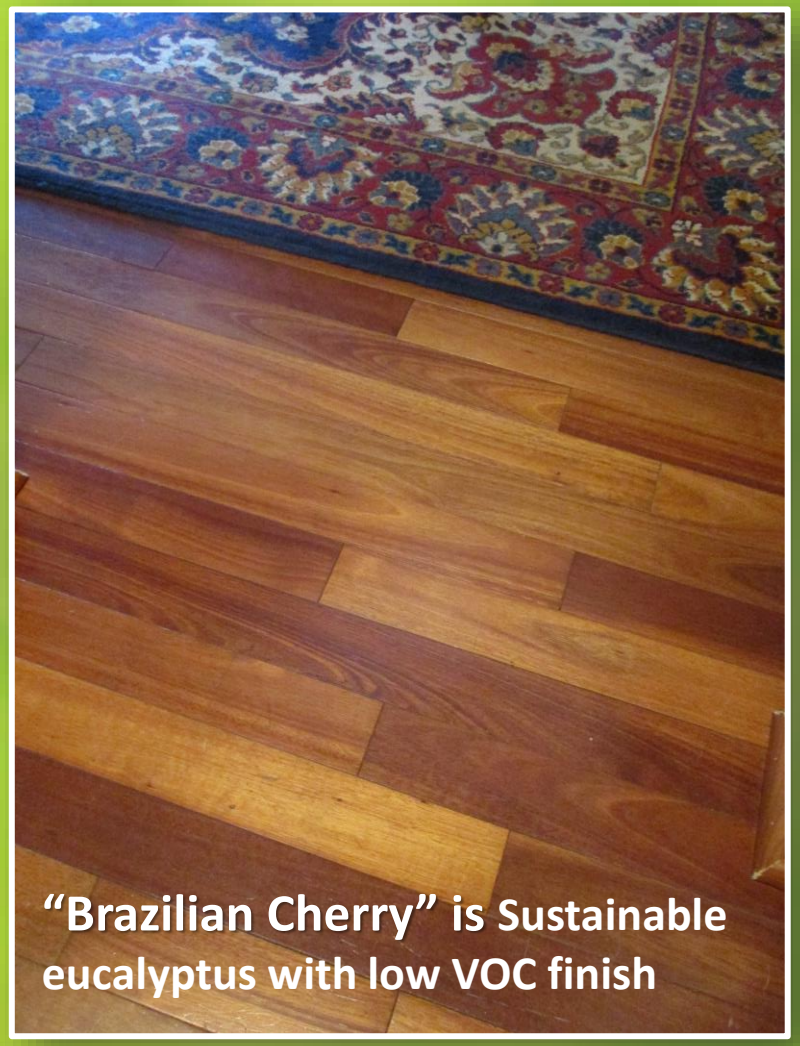
How much food does your family put out with the trash every week? How about down the disposal? How about none!

[10-YEAR NUMBERS]

Green Cone saved 1.8 tons

- Very few scraps go down the disposal.
- The average weight of the scraps dumped in the digester every night is 1 pound.
- 1 pound x 365 days x 10 years = 3,650 pounds (1.83 tons)

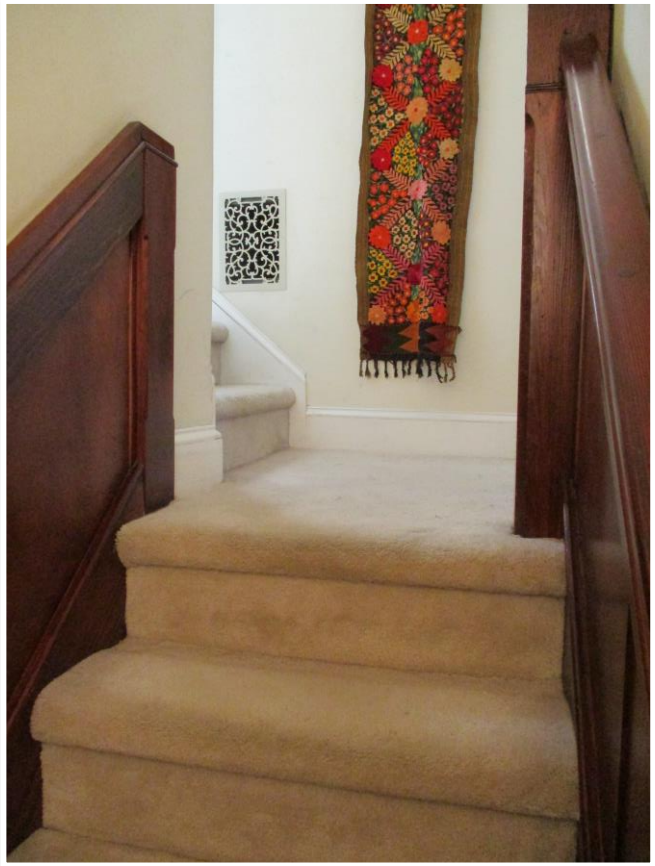
2 - Buy Only Non-toxic Products



High Performance = Healthy Too

Low VOC finishes such as Water-based paints, stains, Tung and orange oils

All interior finishes are important for good indoor air quality (IAQ)



Salvaged carpet upstairs means no VOCs for the house

Rugs and hard flooring and low VOC finishes

3 - Take Advantage of the Site and Sun

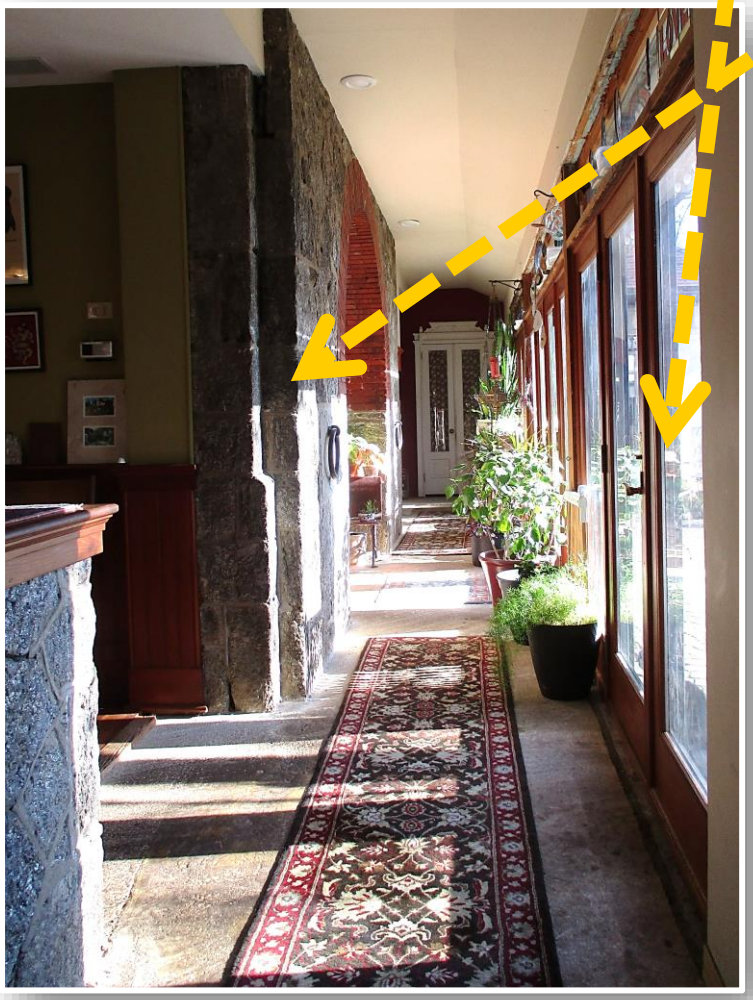
Thermal mass is critical as part of passive solar construction. Stone, brick, concrete and water can all absorb and store lots of heat from the sun.

1986 Façade faces southwest

Original façade in now inside

Passive Solar Heating

Infrared image of solar hall



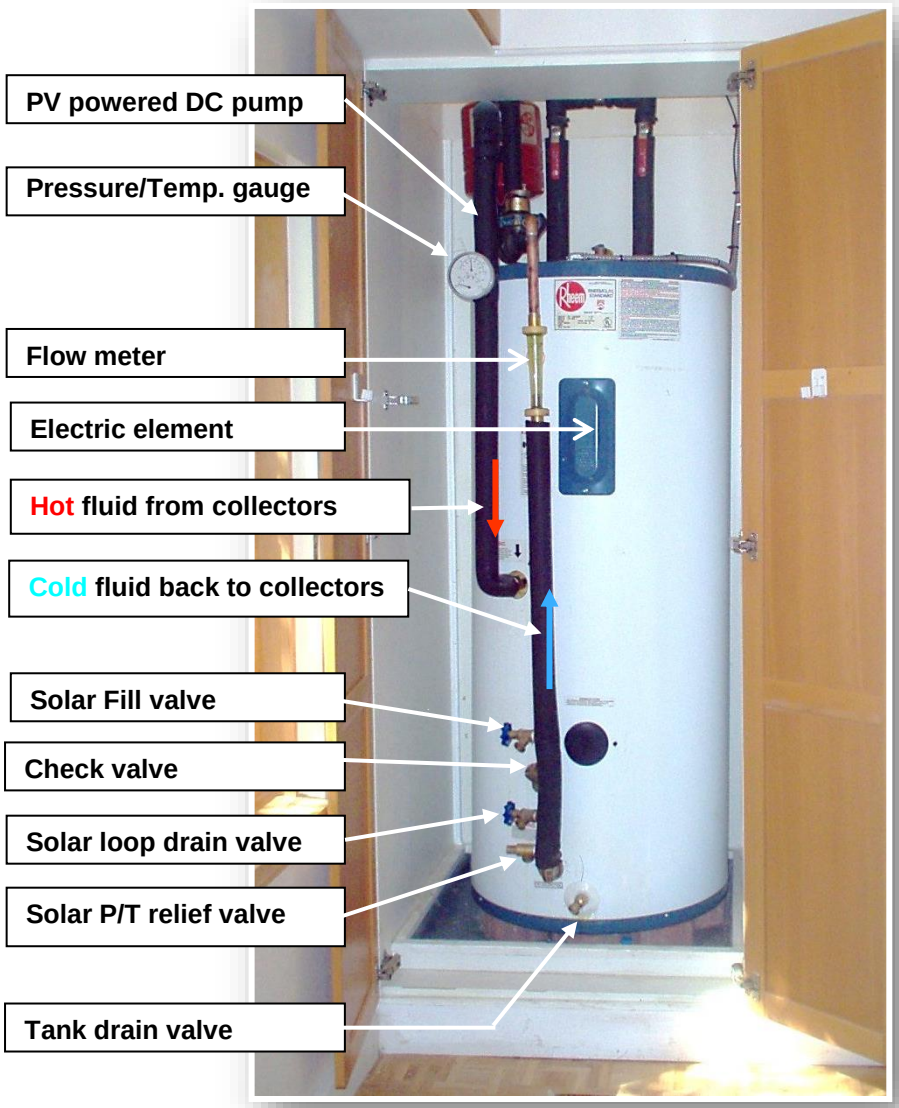
Low winter sun angle

vs.

High summer sun angle

Solar Hot Water

- 15 high efficiency ThermoMax evacuated tube collectors on roof (below)
- 80-gallon solar hot water tank in the laundry room (right).



4 - Buy the Most Efficient Appliances

- **ENERGY STAR** font loading Frigidaire washer and dryer
- **ENERGY STAR** Amana refrigerator (1.5 Kwh per day)
- **ENERGY STAR** Bosch quiet dishwasher
- **Induction cook-top**

Cooling is a System

- **Shading from mature trees and properly placed trees east and west of house**
- **Shading from overhanging eves**
- **Whole house fan**
- **Lenox 14-SEER** scroll-style air source heat pump

Whole house fan in attic

The old heat pump

New Heat Pump Coming

High Efficiency Chiltrix CX34 2-Ton Air to Water Heat Pump

- Cooling 25,590 Btu
- COP 6.51
- EER 22.21
- Heating 33,813 Btu
- COP 3.92

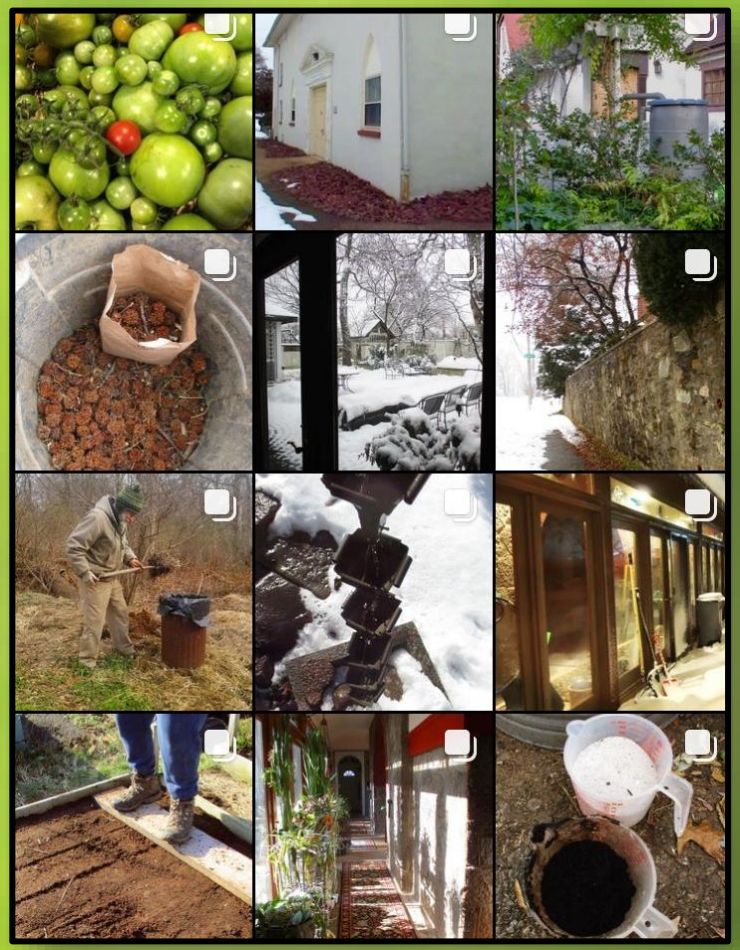
Fan Coils are basically radiators with a fan that can be floor, wall or ceiling mounted

Water routed to room(s) that is(are) calling for heating or cooling – up to 8 units.

Heated or chilled water to inside buffer tank

Mono Block outdoor unit with variable speed compressor and pump

THANK YOU



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