

# **One Person's Journey** **Towards Sustainable Living**

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# Why Be Sustainable?

- **I just hate waste of any kind, be it resources, time, money, effort, etc.**
  - **Started avoiding waste very young out of necessity.**
  - **Enjoy building and modifying things.**
  - **Ends up as a mindset that underlies most everything I do.**
- **Many efforts to be sustainable save money in the long run.**
- **Can't cover all I've done and do in 90 minutes, so just touch on some highlights.**
- **More detail may be found on my website:**
  - **[www.stonemarmot.com](http://www.stonemarmot.com)**
  - **See “Rants And Raves Blog” on site.**
  - **See articles under “Energy/Environment” and “Solar Energy” categories.**
  - **These slides will be in article called “Sustainability Talk.”**

## **My Electricity Use Is Extremely Low**

- **Used about 850 kwh of AC electricity last year.**
- **Many of the things I did are discussed in the one hour Pinellas Energy Efficiency Project (PEEP) class.**
- **I didn't just make a couple of changes to reduce my electric consumption. I've done about 400 to 500 things over the years, most rather small, to get my electricity use so low.**
- **Many of the things I did also have other benefits:**
  - **Reduce sound entering or leaving house.**
  - **Reduce insects and other critters from getting into house.**
  - **Help protect house from storms, such as hurricanes.**

02/12/12

**Average Electricity Use Per Household**

Country	Per year	Per month	Cost per month (\$)				(Millions)	
	Used (kWhr)	Used (kWhr)	Electric	Hookup	Subtotal	Taxes	Total	Population
United States	12000	1000	\$120.00	\$8.76	\$128.76	\$3.22	\$131.98	310
Florida	14328	1194	\$153.28	\$8.76	\$162.04	\$4.05	\$166.09	17
United States (house)	17000	1417	\$174.21	\$8.76	\$182.97	\$4.57	\$187.54	310
France	3400	283	\$34.00	\$8.76	\$42.76	\$1.07	\$43.83	59
Germany	3900	325	\$39.00	\$8.76	\$47.76	\$1.19	\$48.95	78
Netherlands	3300	275	\$33.00	\$8.76	\$41.76	\$1.04	\$42.80	16
Switzerland	5700	475	\$57.00	\$8.76	\$65.76	\$1.64	\$67.40	7
United Kingdom	3300	275	\$33.00	\$8.76	\$41.76	\$1.04	\$42.80	60
Japan	5945	495	\$59.45	\$8.76	\$68.21	\$1.71	\$69.92	130
Australia	6400	533	\$64.00	\$8.76	\$72.76	\$1.82	\$74.58	22
Canada	11111	926	\$111.11	\$8.76	\$119.87	\$3.00	\$122.87	32
New Zealand	7873	656	\$78.73	\$8.76	\$87.49	\$2.19	\$89.68	4
Me (1989)	3220	268	\$32.20	\$8.76	\$40.96	\$1.02	\$41.98	
Me (2009)	1108	92	\$11.08	\$8.76	\$19.84	\$0.50	\$20.34	
<b>Average for Europe</b>	<b>4667</b>	<b>389</b>	<b>\$46.67</b>	<b>\$8.76</b>	<b>\$55.43</b>	<b>\$1.39</b>	<b>\$56.82</b>	<b>380</b>

Electric rate: \$0.120 Per kWh Plus \$0.01 per kWh for over 1000 kWh/month  
Tax rate: 2.50%

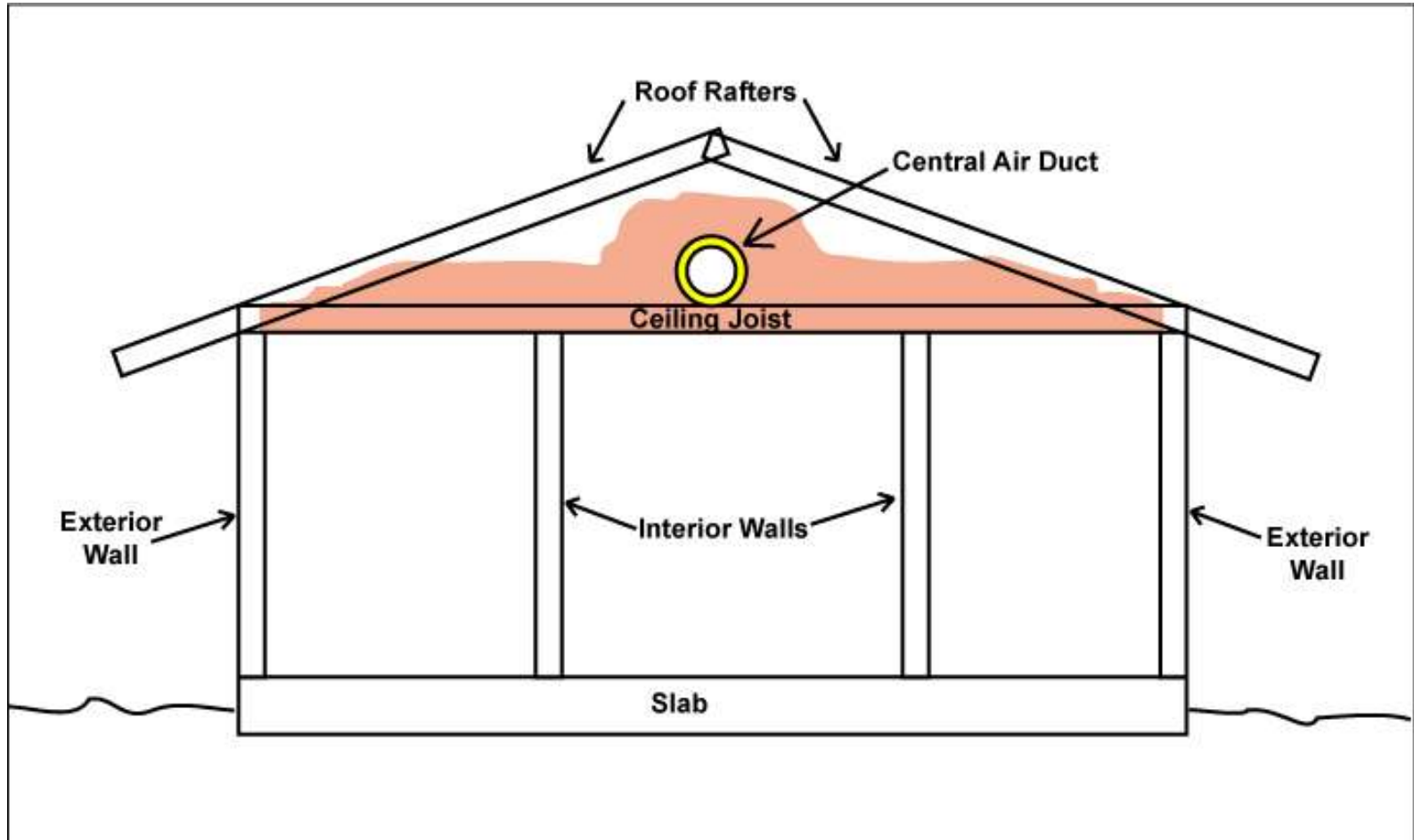
## **Air Conditioning Myth**

- **The instantaneous reaction of most people to hearing how low my electricity use is: “You probably don't use any air conditioning.”**
- **They are partly right, I use much less air conditioning because I don't need it to keep my house a comfortable temperature.**
  - **I have a well sealed and insulated house, so less heat entering and exiting the house.**
    - **White cement tile roof.**
    - **White exterior cement block walls.**
    - **18 inches (R-57) insulation in attic.**
    - **Radiant barrier on underside of roof rafters.**
    - **Air conditioning ducts well sealed and buried in insulation.**
    - **Attic well ventilated.**
    - **Foam injected into cavities of cement block walls.**
  - **I have terazzo floors in most rooms of house.**
    - **Tends to keep inside closer to ground temperature.**

## Radiant Barrier Stapled To Bottom Of Roof Rafters



# Ducts In Attic Insulated

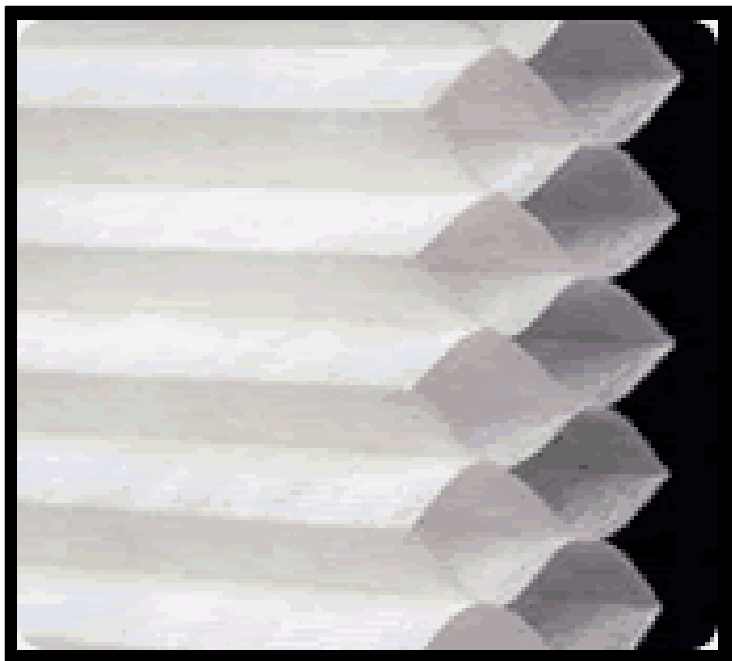


## **Air Conditioning Myth (Continued)**

- **I open and close windows to take advantage of daily temperature changes.**
- **Shaded walls with plants, water tanks, arbors, trellises, etc.**
- **Shaded windows from direct sunlight with vegetation, awnings, and/or roll down shutters.**
  - **Also protects windows from storm damage.**
- **Use insulating coverings over windows, like insulating drapes.**
  - **Honeycomb cellular blinds appear to be best, especially ones with double cells and side rails.**
- **BUT, MOST IMPORTANT:**
  - **I have also greatly reduced the amount of heat being generated inside the house.**
    - **Almost all the electricity you use eventually becomes heat.**
    - **You have to remove this heat in the summer with air conditioning.**



## Honeycomb Cellular Blinds



## Some Ways I Reduced Electric Use

- I don't turn TVs or radios on just for background noise.
- I don't have any ceiling fans.
  - Ceiling fans do NOT cool a room, they heat it up.
- I turn on my water heater only when needed.
- I don't leave computer on 24 hours a day.
  - Also makes computer less susceptible to viruses, power glitches, and lightning strikes.
  - Don't automatically turn on all the accessories, such as printer, speakers, etc., when using computer.
  - I don't leave modem on all the time.
- I don't leave lights on in unoccupied rooms.
- I don't light up a whole room to read or work on computer. Put a light by reading chair or computer.
- I painted the walls and ceiling white.

## Reduce Phantom Loads

- **“Phantom loads” are things that still draw power even when they are supposed to be “turned off.”**
  - **Obvious things are cell phone chargers, microwave ovens, computers.**
  - **Not-so-obvious things are doorbells, controls for central heat and air conditioning, stereos, TVs, ground fault interrupters (GFIs), arc fault circuit interrupters (AFCIs), remote power supplies (wall warts), clothes washers and dryers, modems, cable TV boxes, uninterruptable power supplies (UPSs), computer printers and speakers.**

# Examples of Switched Multioutlet Strips



## Other Ways To Reduce Heat Inside House

- **I usually enter and exit my house through a non-conditioned room, such as the garage or storage room.**
  - **Least heat transfer if door doesn't go straight from air conditioned house to outside, but through intermediate room which acts like air lock.**
  - **Was common in older houses up north: The vestibule.**
  - **Also helps reduce sound and pest transfer into house.**
- **Move heat generating appliances outside of air conditioned house during warm weather.**
  - **For example, I use my breadmaker in the kitchen in cold weather but run it in the garage during warm weather.**
- **Cook items in the same pot at the same time instead of using multiple pots and burners.**
  - **Heat egg noodles and beans in the same pot at the same time.**
  - **Make stews or soups instead of separate dishes.**

## **Other Ways To Reduce Heat Inside House (Continued)**

- **Use only one heater and cook items sequentially instead of all at once on multiple heaters.**
- **Once your stove burner and liquids get to temperature, they will stay at temperature for a long time.**
  - **Consequently, you can “coast cook” by turning the electricity off before the food is totally cooked and let this stored heat finish the cooking.**
  - **When I cook pasta, I bring the water to a boil, put the pasta into the pot, and then turn the electricity off. The pasta still cooks thoroughly in the same amount of time as if I had left the burner turned on.**
- **When draining hot water from pots drain it into a bucket in house during cold weather, outside of house during hot weather.**
- **Always use lids on your pots and keep the lid completely over the pot.**

# Solar Electric System

- **Ten 200 Watt photovoltaic (PV) panels, 2000 Watts total.**
- **One 3000 Watt inverter.**
- **Eight 6 Volt, 310 Amp-hour batteries.**
  - **Series wired into one 48 Volt string.**
  - **About 15 kilowatt-hours total capacity.**
- **One 5000 Watt inverter/charger for battery backup.**
- **Total system generates about 3100 kilowatt-hours a year.**
  - **Over three times what I use a year.**

## PV Panels On Roof





# Rainwater Harvesting And Storage

- **Have about 1400 gallons of rainwater storage.**
  - **11 rain barrels.**
  - **Three 275 gallon tanks (1000 liter IBCs).**
  - **All interconnected so they overflow into each other.**
  - **Last overflow directed into perforated drainfield pipes buried in gardens.**
  - **Fed by gutters on shed and back of house.**
- **Water from gutters in front of house flows through perforated drainfield pipes buried in gardens in the front yard.**
- **Part of roof has no gutters; water falls into swale to allow it to percolate into front yard.**

# Rain Barrels



# Sustainable Landscaping

- **Eliminated turf grass lawn about four years ago.**
- **About 45 % native plants, such as:**
  - **Firebush, sunshine mimosa, beach sunflower, coontie, slash pines, tropical sage, lyreleaf sage, dotted horsemint, sabal palms, needle palms, saw palmetto, wild coffee, blanket flower.**
- **About 45 % food producing plants, such as:**
  - **Fruits include tangelos, oranges, mulberries, kumquats, loquats, Surinam cherries, cherry-of-the-Rio-Grande, Natal plum.**
  - **Perennial vegetables include moringa, chaya, edible hibiscus, cranberry hibiscus, prickly pear cactus, sweet potatoes, sunchokes, lemon grass, evergreen bunching onions, Malabar spinach, Okinawa spinach.**
  - **Annual vegetables include tomatoes, okra, carrots, roselle, lettuce, clay peas, cow peas, cucuzzi, Seminole pumpkin.**
- **About 10 % ornamental exotics that were present when I bought the house.**
  - **Serve a purpose and are no problem, so I leave them for now.**

# Reducing Gasoline Use

- **Make a serious effort to reduce the miles I need to drive.**
  - **Average about 7000 miles per year.**
  - **Only use my truck about 150 days a year.**
- **Drive for fuel economy.**
  - **Get over 30 mpg in my pickup truck around town (EPA rating is 22 mpg).**
  - **Get around 35 mpg highway driving (EPA rating 27 mpg).**
  - **Good source for serious info on getting good fuel economy:**
    - [www.ecomodders.com](http://www.ecomodders.com)
    - **My vehicle listed as “Grayranger” in “Garage” section of site.**
- **Often run errands with my bicycle.**
  - **Put about 5000 miles a year on my bike.**

# Financial Sustainability

- **You are not very sustainable if you are dependent on others for every need and to bail you out of every emergency.**
- **Paid off mortgage within six years of buying house.**
- **Minimized regularly scheduled expenses (no cable, cell phone, etc.).**
- **Reduce dependence on insurance companies and disaster relief.**
  - **Storm protection for house.**
  - **Keep house, particularly exterior, well maintained to minimize possible water, wind, and vermin damage.**
- **Live where I could walk or ride bicycle to most places I need to go.**
- **Acquired enough skills that I can build or fix most things myself.**
  - **Have stock of necessary materials.**
  - **Good at repurposing materials.**