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Shenandoah Sunshine: Harvesting Solar Power in the Valley

Business Matters: Solar PV that makes Cents

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Because that is the way we always do it!

Here is Edward Bear, coming downstairs now, bump, bump, bump, on the back of his head, behind Christopher Robin. It is, as far as he knows, the only way of coming downstairs, but sometimes he feels that there really is another way, if only he could stop bumping for a moment and think of it.

-Milne, A.A. *The House at Pooh Corner*: New York, Dutton Juvenile, 1988



Power Facts

Power Consumption vs. Price

Americans consume 26% of the world's energy with only 5% of the world's population

Demand for power is usually much higher during the working day than late in the evening, and tends to peak during very hot and very cold weather.

Our demand for energy grows by about 3% every year



Power Facts

Inefficiency Hurts Everyone

The US was self sufficient in energy until the late 1950's

In 2007, net imported energy accounted for 29% of all energy consumed.

Transmission Line loss is estimated to be on average 50%

On average commercial buildings use 30% of energy consumption inefficiently



Power Facts

Solar PV as a Business Solution

Electricity demand in the U.S. will grow by at least 40% by 2032.

New power generation equal to nearly 300 power plants will be needed to meet electricity demand by 2030. It takes 7-12 years to build a new Nuclear plant (these plants cannot be used for peak-load)

Electricity costs in the US have been rising about 4% per year for the past ten years, primarily because of the increase in costs of fuel



Power Facts

Solar PV as a Business Solution

Current pricing is about \$4/watt installed. In 2008 it was around \$6.50 per watt installed

In two years, the prices for solar photovoltaic panels have plunged as a result of greater efficiency in manufacturing and in the technology itself. Increasing competition among a growing number of suppliers has also helped reduce costs.

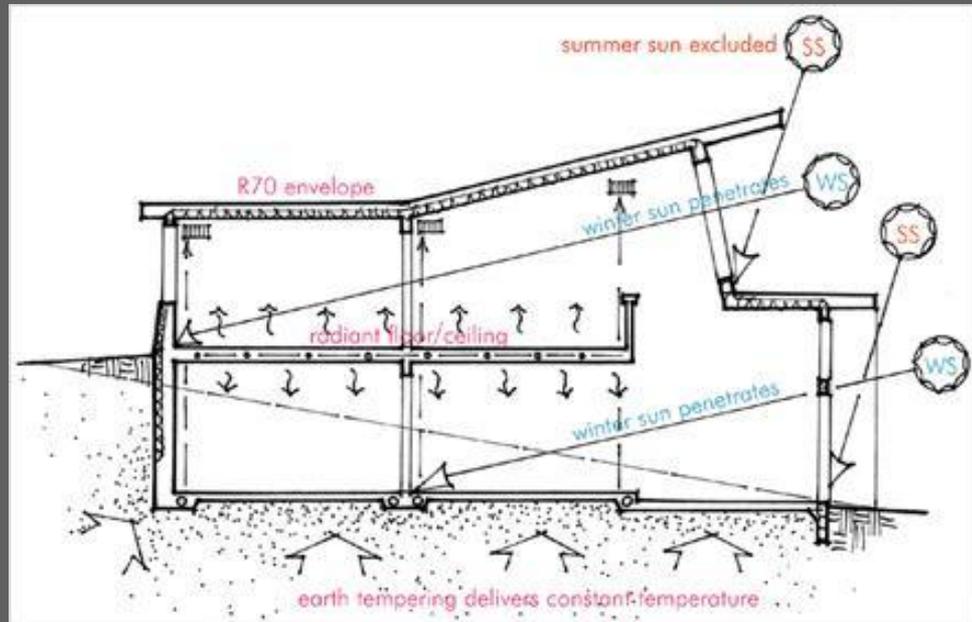


Power Facts

Solar PV as a Business Solution

A PV system that is 50 years old will still produce at 75% of original performance. Systems are predicted to last 100+ years.

Solar parity with coal is predicted to happen by the year 2014 – 2017



Solar PV that makes Cents

Solar PV Investment

Factors to consider:

Initial Electricity Rate

Average yearly increase

Decline in efficiency of solar panels

Peak load costs

Loan Interest Rate

Actual Panel Power Output for full sunshine

Average Sunshine hours per day for a year

Available Local, State, and Federal Incentives

State or Federal Tax Deductions or reductions

Solar Renewable Energy Credits (SRECs) that may be saleable

Property Value of Installation

Payback: 16 years or less



Power Facts

Solar PV Advantages

No power drop over power lines

Set energy prices for 50+ years (positive cash flow after 16)

Not dependent on energy imports from other countries

Not risking lives to mine the limited resource

Energy is clean, renewable, and reliable

Provides local jobs for installation

Reduces the demands on existing infrastructure



New Ideas

Vehicle to Grid

Solar and Electric cars provides power to help balance loads by valley filling and peak sharing



Solar Paint

Swansea University, Wales, United Kingdom



- Potential of 4,500 gigawatts of electricity or 50 wind farms per year if just one steel roofing manufacturer coated everything they sale

Solar Film

Window Film



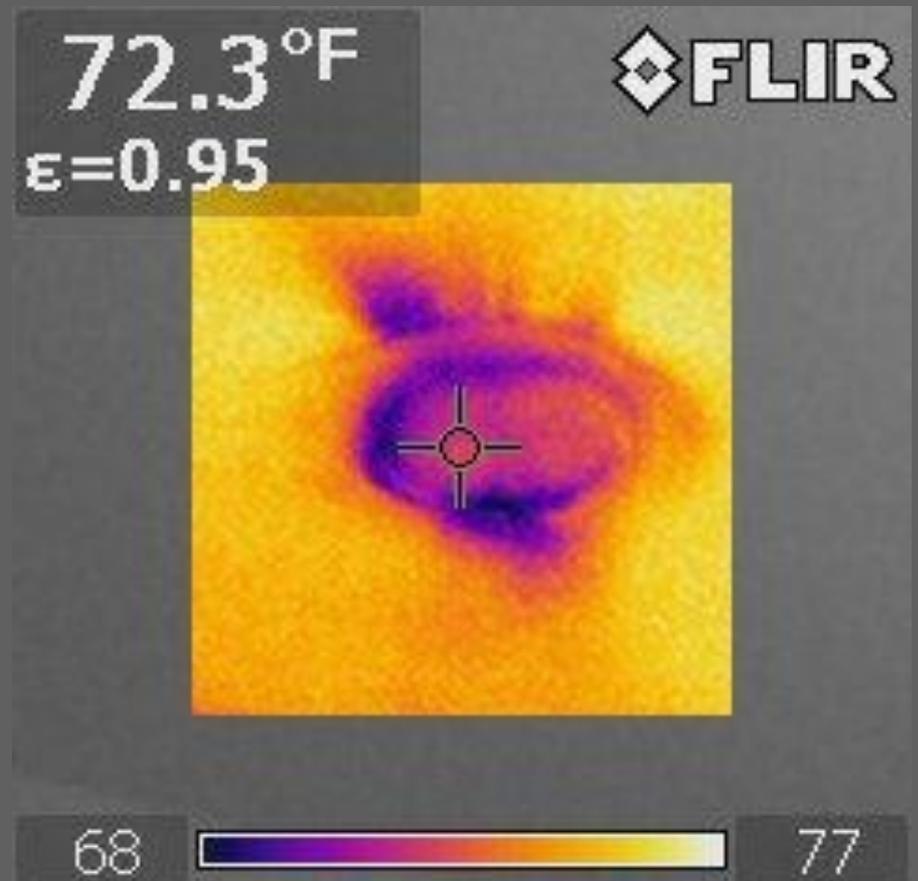
Resource Depletion

Alternative energy



Conservation is first step

Get the buildings energy efficient first



Better Living Phase II

Certified

- 47% reduction in annual energy use
- 52% recycled content
- 34% regional materials
- 95,000 gallon rainwater collection system
- 95% of construction waste diverted from the landfill



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BETTER LIVING MILL SHOP

Net-Zero Home in Central Virginia



- Energy cost for first year = \$25 (the hook up fee)

Northern Albemarle County

LEED in Central Virginia

Registered



- Displacing 5.77% of annual energy usage with solar hot water.

- Adding a 1.5 kW Array to offset a total of 7.5% of their annual energy usage.

Grottoes, Virginia

Thank You

Questions?

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