

Integrated Green Design: Going Beyond Checklists

*Greening the Hospitality Industry
Airlie Conference Center*

February 5, 2004



Harnessing the power of voluntary *markets* . . . to improve the *environment*.

**Alden Hathaway
Environmental Resources Trust, Inc.**

Why do Green Design?

The Triple Bottom Line

- Economic Advantage to the Owner;
- Social Responsibility – Marketability and Competitiveness;
- Environmental

Lorissa McAllister, Architect
Progressive Architects/Engineers

Importance of Green Design

- The 'Cost and Financial Benefits of Green Building'* report quantifies the benefits of building green in energy savings. Those benefits include:
 - Lower Energy Bills
 - Lower Water Costs
 - Less Environmental And Emissions Impact
- According to the report an investment of 2% construction costs yields a benefit of 10 times the initial investment – The ratio is enhanced when energy design is integrated

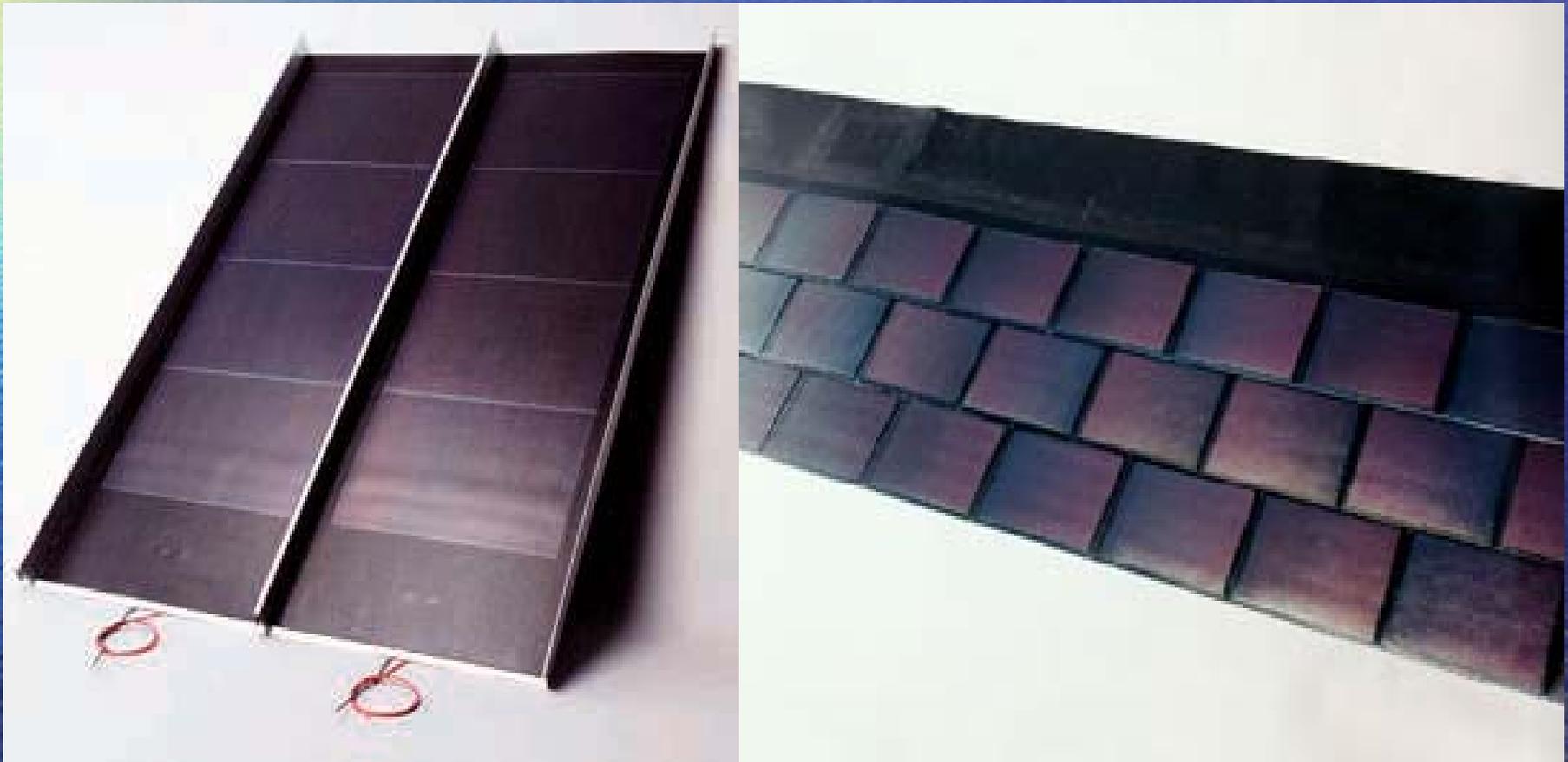
* A report to California's Sustainable Building Task Force –Oct 2003

Integrating Green Energy Design

A Living Design vs. A Simple Checklist

- Checklists do not guarantee Design Integration
- Energy technologies interact often proving that the sum of the parts is higher in cost and energy intensity than the same parts downsized for integration, for example:
 - Energy-efficient lighting reduces heat output reducing needed air conditioning equipment allowing for more expensive yet more energy-efficient HVAC systems;
 - Building integrated solar roof systems, save roofing costs and increase insulation from the sun and elements, reducing HVAC loads and, combined with energy-efficient lighting, lowers solar system requirements, hence improves system-wide economics

Example: New Solar Products Make Building Integrated Solar Cost-Effective and Invisible



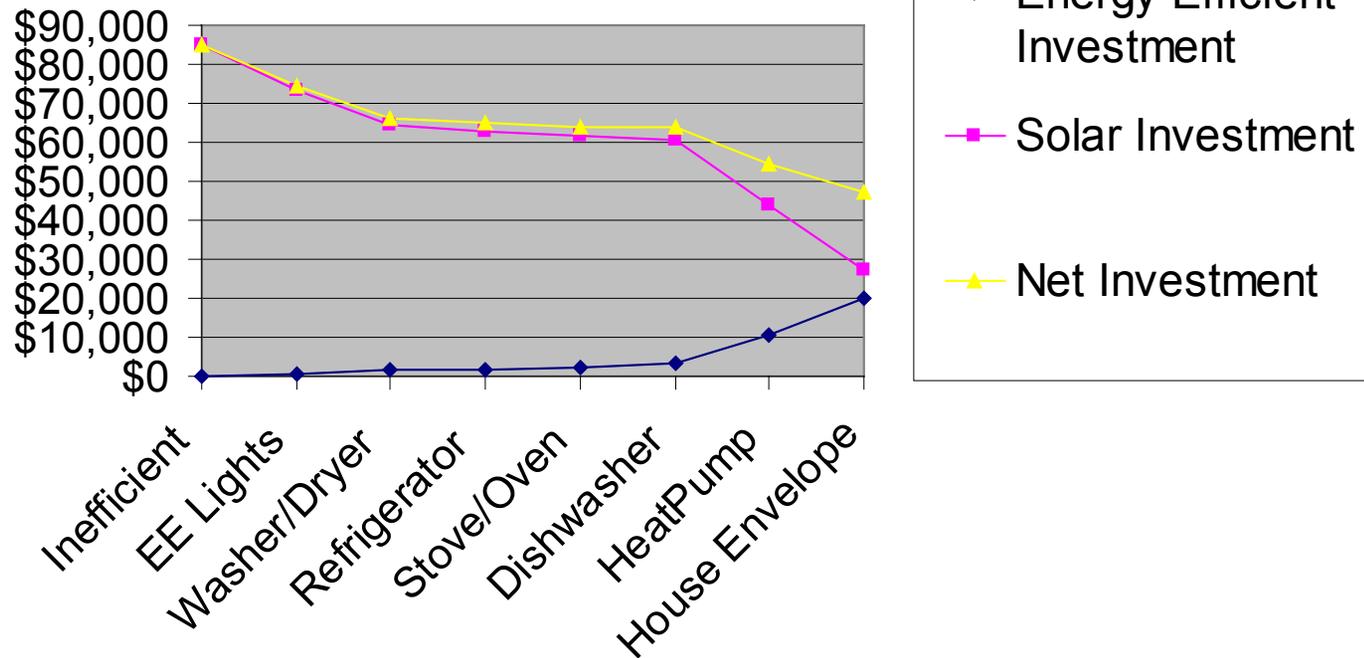
Imagine Outfitting an Airlie Building with Standing Seam Solar Modules Increasing the Building Value



This 2 kilowatt solar system provides nearly 30% of the electricity requirements of this townhouse in Bowie, MD. The owner had six prospective buyers seeking to purchase the house when it sold in 2000.

Energy-Efficiency Collapses the Cost of Going Solar

Energy Efficiency Impact on Solar Investment



Building an Affordable Solar Home - *Solving A Nation's Quest for Sensible Energy and Environmental Strategy* - Alden Hathaway, 2003

Hathaway's Zero Energy Solar Home

Hillsboro, Virginia



Our 6.0 Kilowatt Solar System provides over 95% of our energy needs.

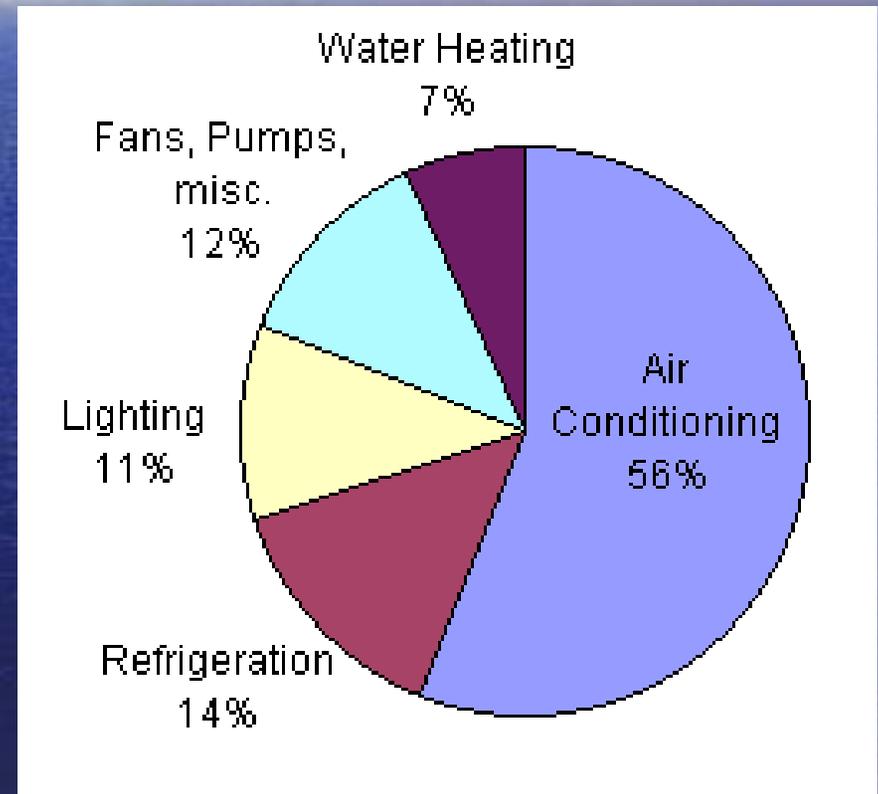
The Triple Bottom Line

Economic Advantage

- Energy – efficiency plays an important role in the tourism industry, primarily as a significant opportunity to increase profits:
 - for example, 3% of Airline operation costs are for oil, gas and electricity and go directly to the bottom line;
 - if profit margins are 10%, then a 33% reduction in oil, gas and electricity costs increases the profit margin by 9%;
- Green Building Design Enhances Building Value:
 - an investment of 2% construction costs yields a benefit of 10 times the initial investment;
 - the ratio is enhanced when energy design is integrated, can collapse construction costs while increasing energy savings

The Impact of Energy-Efficiency to the Bottom Line

- *For example, over one third of the total energy bill of a hotel in the Caribbean could be saved through the use of solar water heating and energy efficiency*



The Triple Bottom Line

Social Responsibility - Marketability

- The Tourism sector is one of the largest industries in the world, contributing up to 11.4% of the global Gross Domestic Product (GDP) by 2005;
- Competing for a share means distinguishing your resort to attract customers out of new hospitality sub sectors, such as EcoTourism;

Social Responsibility - Marketability



The Mauna Lani Resort in Hawaii attracts environmentally minded guests and saves energy (and batteries too!) with items like the solar – powered golf cart above

The Triple Bottom Line

Environmental

- Concern over prospective changes in climate change make using renewable energy simply a matter of common sense;
- Ski Resorts are purchasing wind power;
- National Parks and other governmental organizations are purchasing renewable energy to help meet strict clean air standards

Environmental

The Cirque Lift at Snowmass is fully powered by wind power purchased from a wind farm in Northern Colorado. In one year, 40,000 pounds of coal are saved by using wind power for the Cirque lift which keeps an equivalent of 82,000 pounds of carbon dioxide out of the atmosphere.

Wind Power Certificates are available from utilities and green power marketers nationally



Example Resort:

Mauna Lani Resort in Hawaii



Mauna Lani Resort in Hawaii

Hotel Solar Rooftop System Description:

- There are two solar photovoltaic systems installed atop the hotel's ballroom and maintenance building. Covering almost 10,000 square feet, these systems produce enough energy to power 140 homes.
- The Solar Rooftop also reduces heat gain by over 3 BTUs' per square foot (saves 10% A/C Energy Costs too!)

Benefits:

- Mauna Lani Resort projects net energy cost savings of \$5 million over the next 25 years. By leveraging Hawaii's most abundant resource--the sun--and embracing renewable solar photovoltaic technology to generate clean reliable power, Mauna Lani significantly reduced its operating costs and helped preserve Hawaii's natural beauty.
- It is estimated that over the 25-year lifetime of the systems, the solar-generated electricity will reduce emissions of nitrogen oxides by 75 tons, sulfur dioxide by 60 tons and carbon dioxide by 20,000 tons. These emissions reductions are equivalent to planting over 1,000,000 trees or removing over 5,000 autos from the roadways.

Example Resort: *Coyaba Hotel, Grenada*



Coyaba Hotel in Grenada

Hotel Energy Upgrade Description:

- Coyaba replaced window A/C units with mini split systems increasing the EER from 7 to 10 and achieving a 17% energy savings;
- All Incandescent Lamps were replaced with Compact Fluorescent saving 5% in energy consumption;
- Solar Thermal (hot water) Panels and insulated pipes replaced electric water heating elements saving 7% in energy consumption.

Benefits:

- Coyaba Hotel reduced energy consumption by almost 30%.
- By leveraging the Caribbean's abundant resource of the sun--and embracing renewable solar thermal technology to generate hot water, Coyaba ensures hot water for all its guests even during frequent Grenadan electric power outages.

EPA Green Power Partners Utilizing Solar

- Solar Certificates - City of Chicago Solar Homes

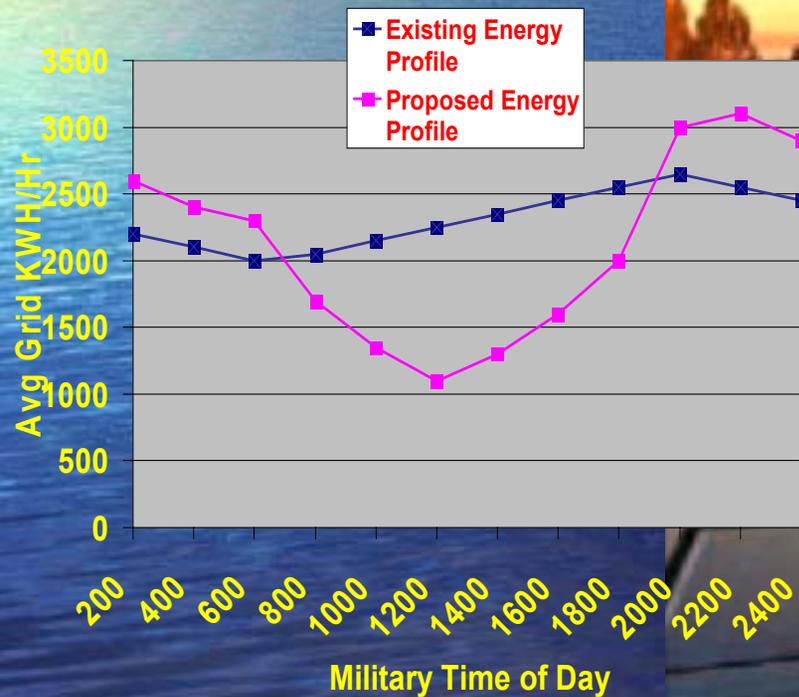


Mayor Daley is presented with a Green Power Certificate from ComEd's John Rowe.

Solar Certificates Provide Additional Funding for Solar Generators & Help Partners Meet Green Power Commitments

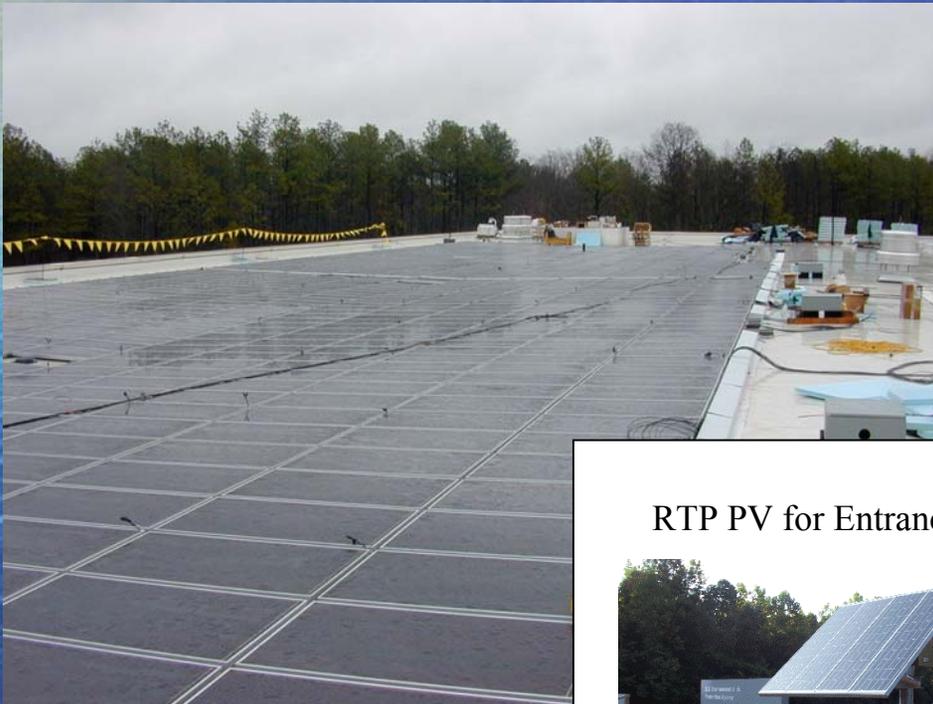
EPA Green Power Partners Utilizing Solar

- Johnson & Johnson Neutrogena



USEPA Uses Green Power

- Visible Commitment



USEPA Research Triangle
Park, North Carolina

Solar Tile Roof Benefit

- 10% Reduction in Cooling Load (HVAC Size Reduction)
- Reduced Roofing Costs
- Additional 3 – 5% HVAC Energy Savings
- Doubling of Roof Life

RTP PV for Entrance Signage



BP Uses Green Power

- Building Integrated Design
 - Roof & Wall Integrated PV Decreases Solar Costs/Enhances Appearance



20 KW Solar Roof on Gas Station Canopy

Integrated PV designs mean the PV material acts as part of the structure eliminating cost associated with mounting duplicate solar roof or wall and other finished surface material.

Building Integrated Design



Building Integrated Design



Future USPTO Building
in Alexandria, Virginia

Seeking Long-Term
Agreement to sell solar
attributes to help finance a
150 KW Solar PV Atrium

Designed by Skidmore,
Owings and Merrill

Standing Seam Solar Modules Could be
Integrated into all these Facilities;



Marriott Cypress Harbor

Standing Seam Solar Modules Could be Integrated into all these Facilities;



Standing Seam Solar Modules Could be Integrated into all these Facilities;



Questions?

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Environmental Resources Trust is a certifier of green power products based on the positive environmental impact in the local air shed:

EcoPower® Certificates are available in Virginia from:

Old Mill Power Company

Sterling Planet

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