Innovating PV/Thermal in Maine

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About Ascendant Energy

- Founded in 2002
- Over 50 PV and Solar Thermal installations in Affordable Housing, Education, Commercial, & Residential
- Engineering Proprietary PV/Thermal Products
- In 2006, $324.3K Award from Maine Technology Institute to Commercialize Products

Affordable Housing, Waldoboro, ME

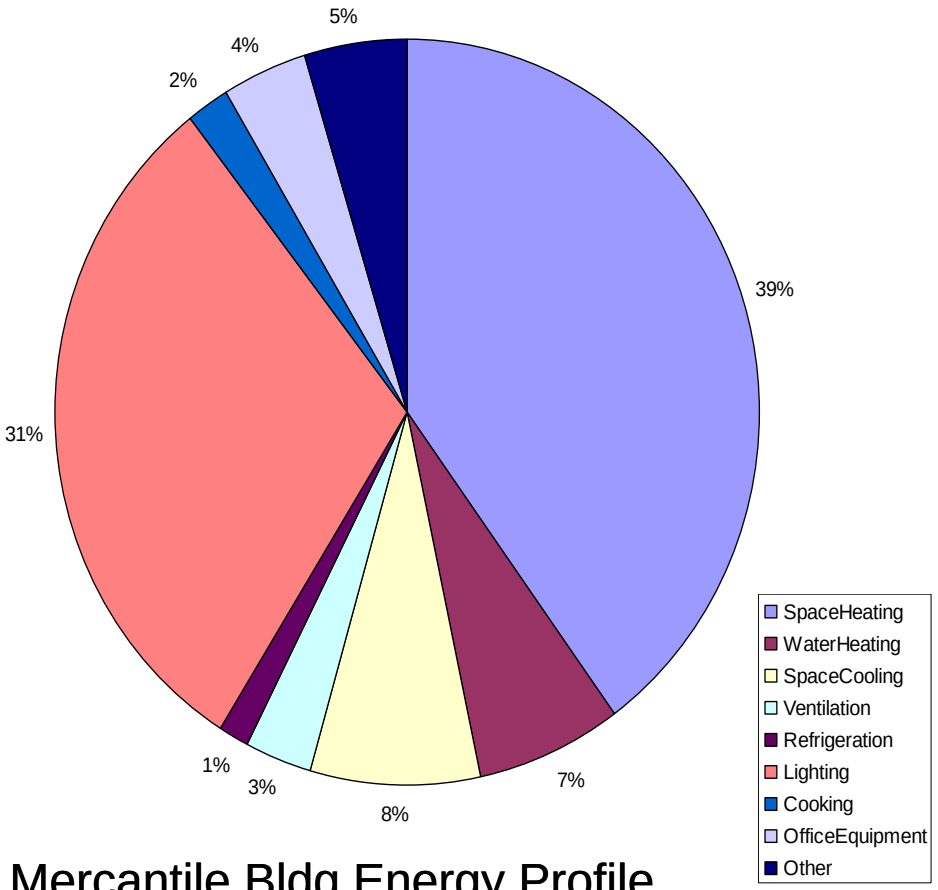
Energy Economics

Navajo Solar & Wind Livestock Well

- Rising energy prices are killing profits/budgets across sectors: 40% of NE electricity from Natural Gas
- Commercial Pain: In retailing, energy is the 3rd largest expense + senior executives receive weekly reports.
- Residential Impact: Heating + electricity = 15% of NET median household income of $25k/yr on Vinalhaven
- Solar Hedge = 25-yr futures contract $1.50/gal #2 fuel + $.06/kWh electricity + 17% IRR.

Understanding Building Energy Usage

- Residential Roof area may provide 100% of annual need from solar: the NET Zero Home
- In Retail, Building's Thermal Loads 50 to 65% versus Electrical @ 25 to 40%
- Hospitality & Healthcare have VERY large hot water needs



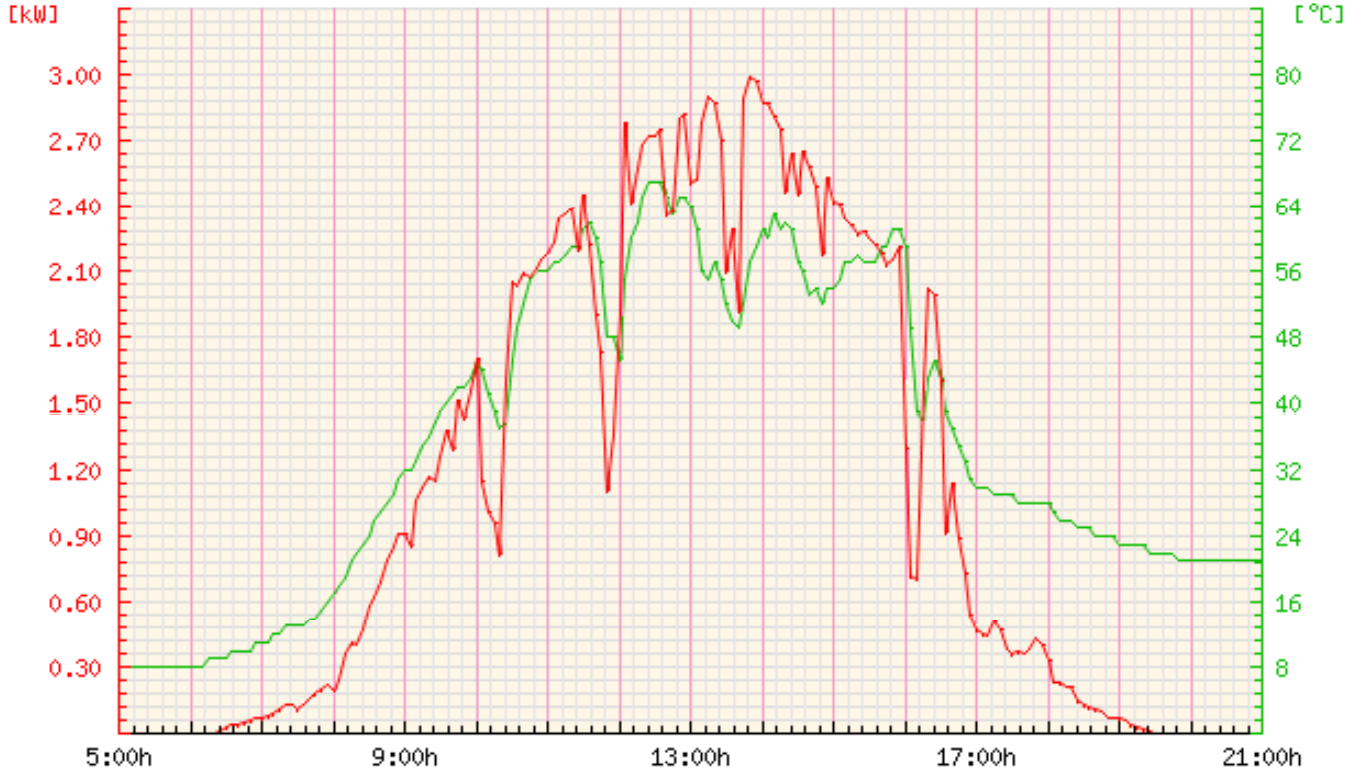
Mercantile Bldg Energy Profile

Closer to Net Zero: PV/Thermal

Ivan Calderwood Home Saves $3200/yr
From PV and Thermal Systems

- Building's Thermal Loads 50 to 65% versus Electrical @ 25 to 40%
- PV/Thermal uses more available solar flux than just PV or Solar Thermal
- Ascendant's Innovations offset BOTH electricity and fuel purchases
- Chiller allows cooling using heat as input

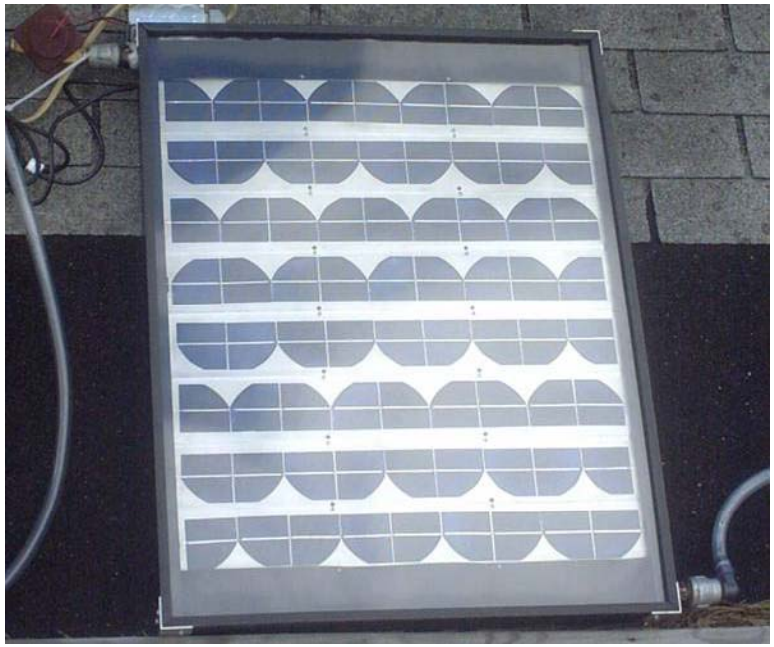
PV & Thermal Performance



- Area under curves is energy produced
- Portland's annual insolation (kWh/m2) = Richmond, VA

SHP™: Solar Heat & Power

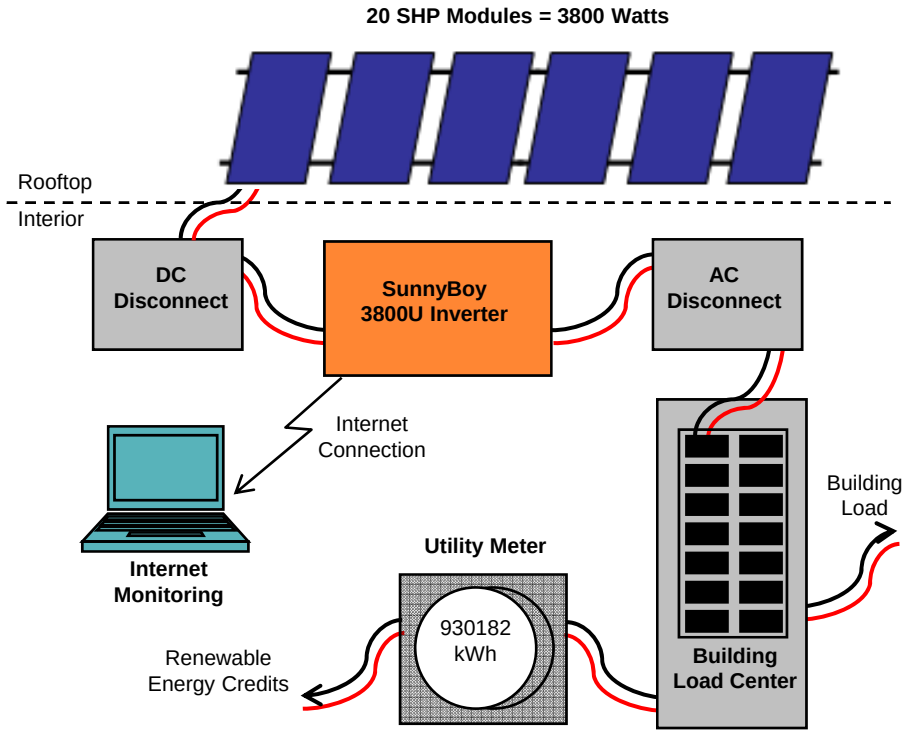
- Pitched Roof Product
- 40 watts from 36 watts of cells circulating 60°F
- No Concentrator Used
- Chewonki Installing 3800 watt System
- IEA SHC Task 35 Project



Solar Cogenerator™: Leading Efficiency

- For large, flat roofs
- Patent Pending Concentrator Design
- Variable Operating Temperature
- Module-area efficiency = 37% (vs. 14%)
- Uses standard c-Si cells (poly or mono)

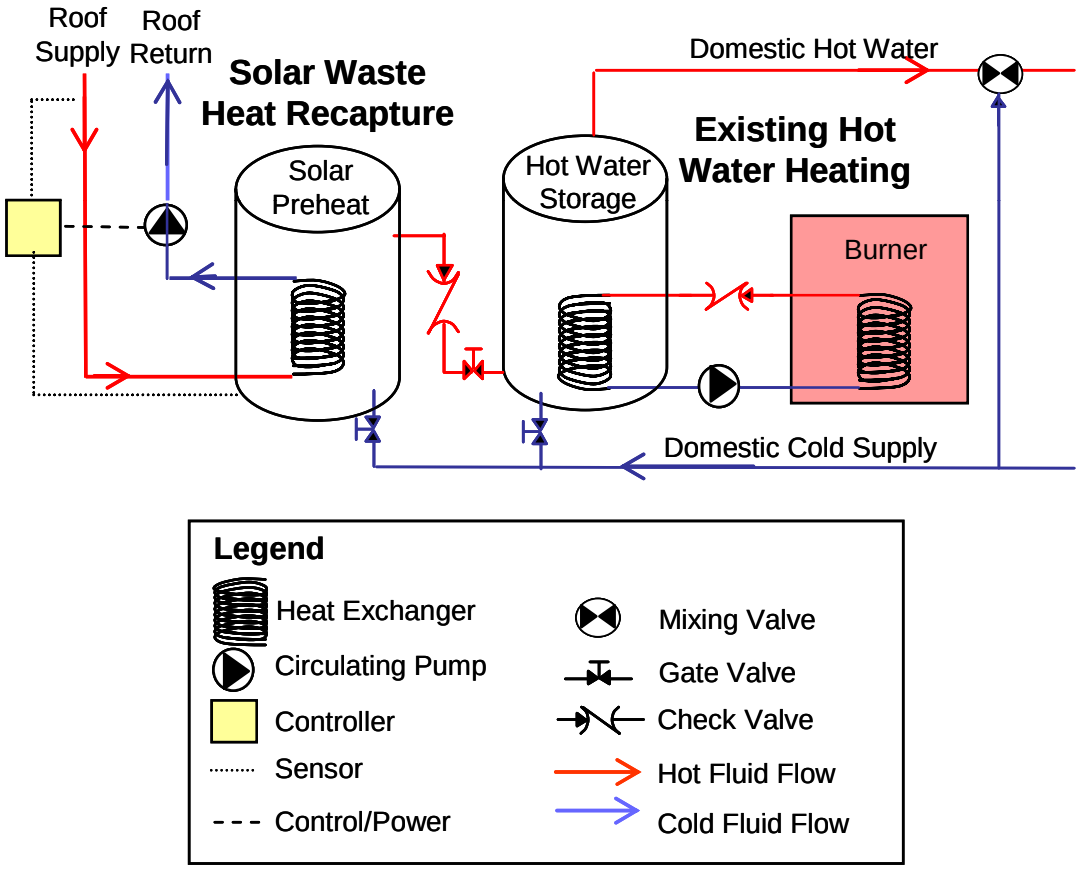
Grid-Tie Solar Electric



- Solar Electricity goes to building loads and/or utility for account
- Battery Backup available to sub-panel for essential loads
- Renewable Energy Credits (RECs) in state earned and sold for utility compliance with Renewable Portfolio Standards (RPS)

Solar Hot Water

- Incoming water at Ground Temp is pre-heated or completely heated to offset fuel consumption
- Space heating option available – Need heat dump for summer because of wintertime sizing



A Little Help From Our Friends

- Maine Technology Institute
  - 3 seed grants totaling $25k plus 1:1 match
  - $324.3k Development Award plus 1:1 match
- Maine Patent Program
- Maine Center for Enterprise Development
  - USM Incubator
- Energy and Environment Technology Council of Maine (www.e2tech.org) board member
- Coastal Enterprises, Inc.
  - Community Development Entity - John Egan, Mike Finnigan, Steve Cole
- Chewonki Foundation
  - Environmental Education Center – Peter Arnold

Collaboration in ME (cont)

- University of Southern Maine
  - Jim Masi advisor with >60 PV patents
  - ASET engineering school and MAC Lab - Bill Moore
  - 2 Engineering Interns
- Maine Space Grant Consortium
  - NASA funded Intern
- University of Maine, Orono
  - Beta demonstration site – Jake Ward
  - Stress testing at AEWC (Advanced Engineering Wood Composites center) – Habib Dagar
  - Wavelength concentration at LASST (Laboratory of Absorbed Surface Science Technology) – Rosemary Smith, PhD

Coming Soon

- Commercial Availability of SHP™ Q1 2008
- Commercial Availability of Solar Cogenerator™ Q3 2008

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