



Rethinking What Solar Power Can Be

Renewable Energy Solutions for Carbon Free Power

December 16, 2008

Leading Safely with Quality, Value, and Craftsmanship

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- **Solution Overview / Value / Benefits**

- **Case Study – 107,000 Watt Power Plant**

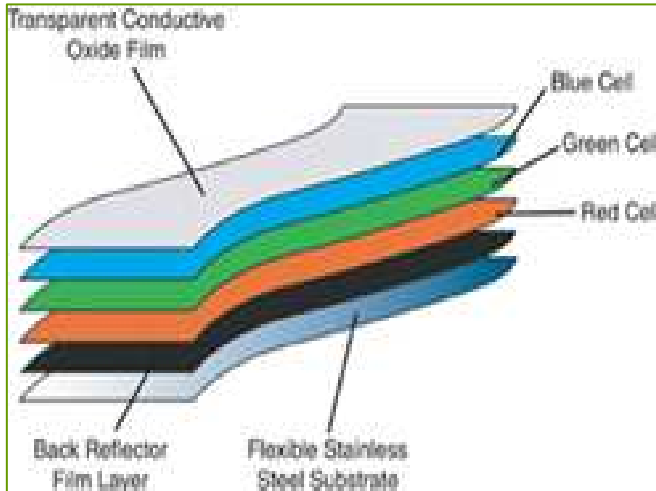
Hamlin Energy Solutions

Full Service - Roof-top Power Plants (RTTP)

Turn-key Solution -
Clean & Simple

- *Design & Engineering*
- *Tax Credits, Incentives, & Financing*
- *Permits, Plans, & Project Management*
- *Installation & Electrical Commissioning*
- *Monitoring & Promotion*
- *Asset Maintenance*

The Panels - "Flexible Flat Panels" Building Integrated Photovoltaic (BIPV) Laminates



- Fully integrated to the building envelope
- Converts 3 types of sunlight
 - Generating power all day long
- Better performance at lower irradiance levels, i.e. cloudy days
- Minimal additional structural weight
- Roof Systems – TPO, EPDM, Modified Bitumen, Metal (16" & above)
- New roofs to 5 years old
- 60 mill and above works best
- Matt System available if removing ability is required

The Panels – Some Additional Specs

UNI-SOLAR.
United Solar Ovonix



- Panels come in 10', 14', & 18' lengths
 - Approximately 4.45 watts per sq ft.
 - Metro Dade County Hurricane uplift rating to 130 mph
 - FM Hail tested
 - 20 year mfg. warranty
 - Light weight - Weighs only 12 ounces per square foot
 - Durable impact resistant Teflon shell
 - Does not impede drainage
 - No roof penetrations
-
- Proven Technology – in production use for 15 years.

- Inverters Sizes:

- can be 30, 75, 100, 260 (future) kW
 - kW measures size of system & inverters
 - kWh measures production

- *100 kW*



- *30 kW*



- *75 kW*



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Case Study – 107,000 Watt Roof Top Power Plant – Benson, NC



Hamlin Roof Top Power Plant – 107,000 Watts

System Size 107,000 watts

Roof Assumptions

- Total Roof Area 70,289 Square Feet
- Roof Area Utilized ~24,000 Square Feet

Current Energy Assumptions

- Current Yearly Energy Usage 576,000 kW
- Average Utility Cost \$.0830 / kWh
- Yearly Cost of Electricity \$47,808

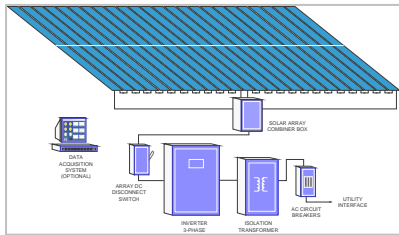
Energy Production

- Panels Installed 765 – 136 watt panels
- Energy Production ~165,000 kWh per Year
- 20 Year Energy Savings ~ \$275, 000

HES Six Step Installation Approach

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Step 1 Design & Engineering

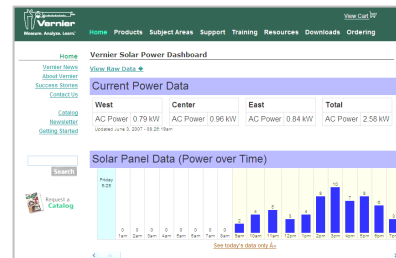


Step 2 Tax Credits, Incentives & Financing



Step 3 Permits, Plans, & Project Management

Step 4 Installation & Electrical Commissioning



Step 6 Asset Maintenance



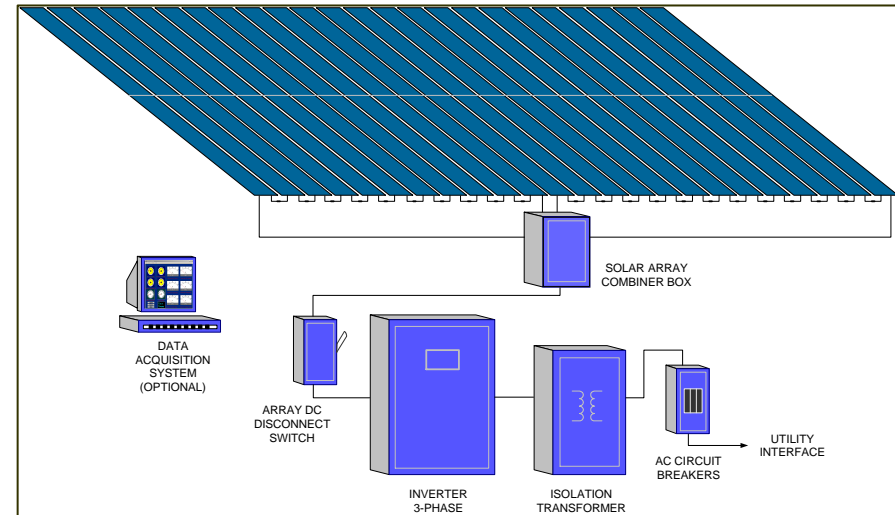
Step 5 Monitoring & Promotion

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Step 1 Design & Engineering

- BIPV system design:



- Certified Engineering drawings & wiring schematic
 - Complete mechanical, system wiring with material, and fuse details
- Roof layout designed for electrical regularity and roof warranty
 - String sizing to meet proper voltage and electrical design
 - Roof layout must be compatible with manufacturers warranty requirements
- Projected production results
 - Projected System Output

Step 2
**Tax Credits, Incentives
& Financing**

<u>Credit / Incentive</u>	<u>Description</u>
• Energy	Utilities Purchase Power
• Renewable Energy Component	Utilities Purchase Green Power
• State Tax Credit	35% Tax Credit over 5 years
• Federal Tax Credit	30% First Year Tax Credit
• Accelerated Depreciation Credit	5 years MACRS
• Interest Expense Deduction	Financed Systems Incur Interest

Financial Model – 107,000 Watt System IRR when Financed can exceed 50%

	Total System & Roof Investment			\$ 845,300.00				
Year	Energy Savings Less Tax effect	Sale of REC's Less Tax effect	North Carolina Tax Incentive 35%	Federal Tax Incentive 30%	Depreciation Savings	Net Cash Flow	Cumulative Cash Flow	
0						\$ (169,060.00)	\$ (169,060.00)	
1	\$ 5,172.03	\$ 15,516.10	\$ 59,171.00	\$ 253,590.00	\$ 43,438.10	\$ 252,827.76	\$ 83,767.76	
2	\$ 5,327.19	\$ 15,516.10	\$ 59,171.00		\$ 90,750.91	\$ 44,215.56	\$ 127,983.32	
3	\$ 5,487.01	\$ 15,516.10	\$ 59,171.00		\$ 54,845.63	\$ 5,805.64	\$ 133,788.96	
4	\$ 5,651.62	\$ 15,516.10	\$ 59,171.00		\$ 33,131.02	\$ (18,595.36)	\$ 115,193.60	
5	\$ 5,821.17	\$ 15,516.10	\$ 59,171.00		\$ 35,686.18	\$ (18,921.20)	\$ 96,272.40	
6	\$ 5,995.80	\$ 15,516.10			\$ 18,429.14	\$ (98,438.70)	\$ (2,166.29)	
7	\$ 6,175.68	\$ 15,516.10			\$ -	\$ 21,691.77	\$ 19,525.48	
19	\$ 8,805.04	\$ 15,516.10			\$ -	\$ 24,321.14	\$ 295,993.39	
20	\$ 9,069.19	\$ 15,516.10			\$ -	\$ 24,585.29	\$ 320,578.68	
	\$ 138,974.44	\$ 310,321.94	\$ 295,855.00	\$ 253,590.00	\$ 276,280.98	\$ 320,578.68		
						(IRR) Internal Rate of Return	59.32%	

Assumptions:

Electrical Cost per kWh: \$.05
 80% Financing: 6 years @ 7%
 Federal Tax Bracket 37.63%

System Cost per Watt: \$ 7.90
 RECS Priced at: \$150.00
 Energy Inflation Factor 3%

System Return Breakdown

System Investment	\$845,300		
			\$ Payback /
Customer Returns		% Benefit	Benefit
Energy		10.4%	\$138,974
Renewable Energy Component		23.1%	310,322
State Tax Credit		22.1%	295,855
Federal Tax Credit		18.9%	253,590
Accelerated Depreciation Credit		20.6%	276,281
Interest Expense Deduction		4.9%	65,850
	System Returns	100.0%	\$1,340,873

Cash Reconciliation	
20% Down	\$169,060
Loan Payment (P&I)	851,234
Net Cash Flow	320,579
Total Cash / Credits	\$1,340,873

New Roof / Re-roofs are Deductible

- All the incentives / deductions flow through to the roof membrane as part of the system for re-roofing and new roofs when installed within 60 days.
 - Private Letter Ruling from the State – “Qualifies the membrane as a necessary component of the Solar Power System”
 - Labor & Material for the Installation

Total Roof Investment		\$ 145,000.00			
Year	North Carolina Tax Incentive 35%	Federal Tax Incentive 30%	Depreciation Savings	Net Cash Flow	Cumulative Cash Flow
0				\$ (145,000.00)	(\$145,000)
1	\$10,150	\$ 43,500.00	\$7,451	\$61,101	(\$83,899)
2	\$10,150		\$15,567	\$25,717	(\$58,182)
3	\$10,150		\$9,408	\$19,558	(\$38,624)
4	\$10,150		\$5,683	\$15,833	(\$22,790)
5	\$10,150		\$6,121	\$16,271	(\$6,519)
6			\$3,161	\$3,161	(\$3,358)
7			\$0	\$0	(\$3,358)
	\$50,750	\$43,500	\$47,392	(\$3,358)	
Net New Roof Cost After Five Years					\$ 3,357.66

Step 5 Monitoring & Promotion

- **LEED Credits** - Up to 15 points if combining energy efficient roofing solution with onsite photovoltaic energy production

SS Credit 7.2

– Heat Island Effect Reduction – 1 point

EA Credit 1.1-1.5

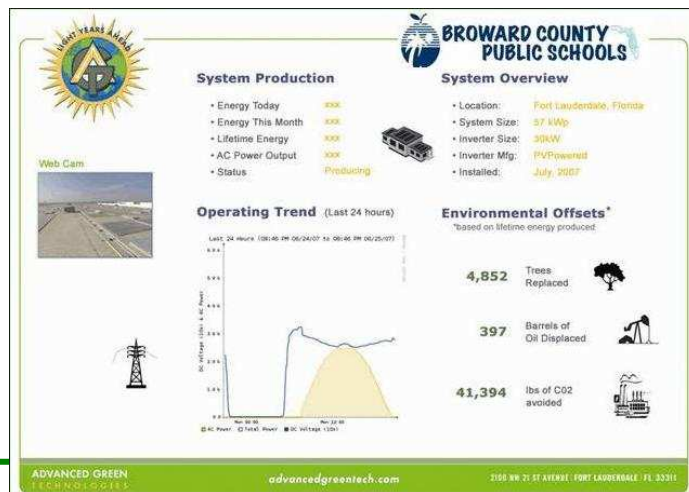
– Optimize Energy Efficiency – 10 points

EA Credit 2.1-2.3

– On Site Renewable Energy – 3 points

EA Credit 5.4

– Performance Measurement – 1 point



- **Data Monitoring - Measure system performance in real time**



HES offerings – Products and Services

Products

- *Roof-top Power Plant*
 - *Panels*
 - *Inverters*
 - *Electrical Hardware*
 - *Wire Management*
 - *Monitoring Software & Presentation*

Services

- *Feasibility Studies*
- *Solution Design / Engineering*
- *REC Negotiation / Agreement Mgmt*
- *Financial Modeling*
- *Permitting*
- *Electrical Commissioning*
- *Leads Analysis*

