The "greening" of Michigan begins in Greenerville

A collaboration between the City of Greenville, Greenville Public Schools, and United Solar Ovonic

Why invest in solar roofs?

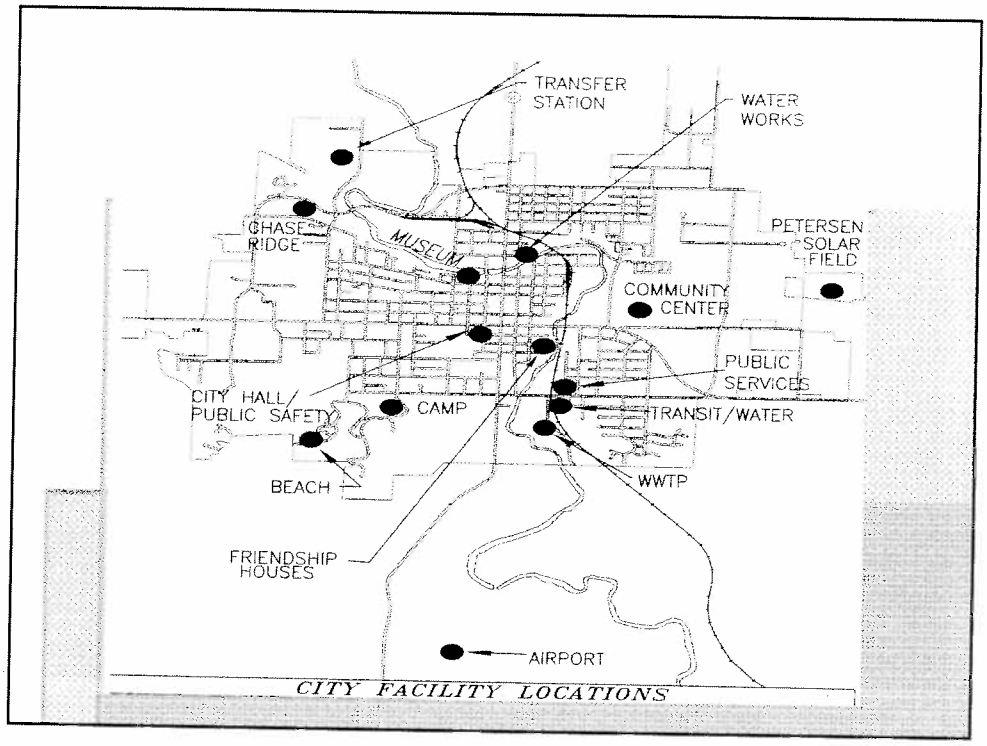
- The technology (product) is proven and available.
- Any technology needs a jump-start and a "flagship" in order to have a systemic impact. Once implemented, Greenville can share the model with all of Michigan!
- Efficiency (and eventual "grid parity") can only increase with experience.

Benefits of Using Solar for Distributed Generation

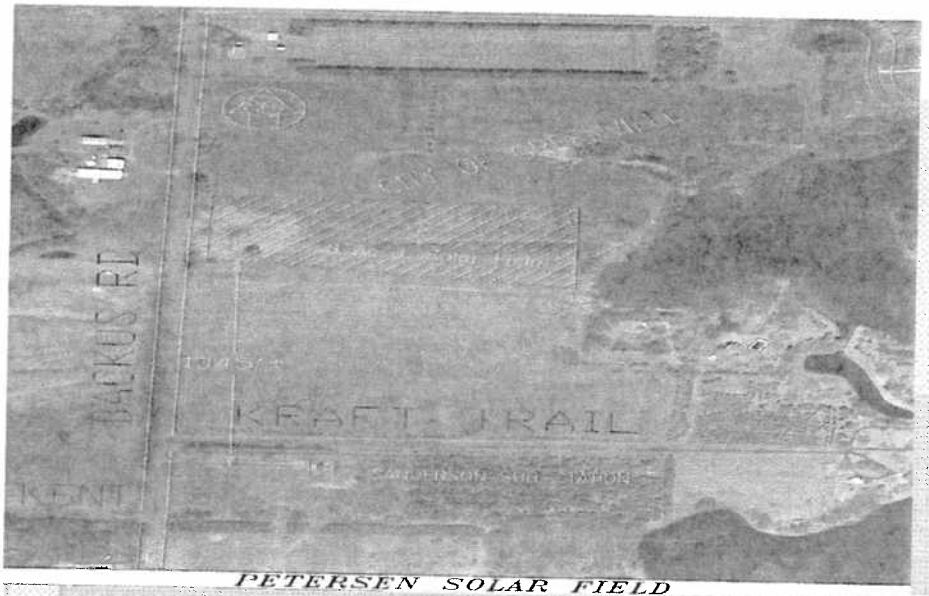
- **Is available immediately.**
  - Traditional power plants take years……Solar rooftop installations operational in a matter of months.
- **•Creates new "green" jobs across the country.**
  - Production and installation of solar energy systems creates more jobs than investment in any other energy technology.
- **•Reduces CO_2 emissions.**
  - Solar energy is clean, renewable.
- **•Optimizes land utilization.**
  - Rooftop solar takes advantage of unused space.
- **•Saves capital by avoiding infrastructure construction.**
  - Our nation's electrical grid is at the breaking point.Distributed Generation reduces the need for additional transmission.
- **•Provides strategic backup in case of grid interruption.**
  - Distributed Solar Generation is always available with the sun.
- **•Improved Air Quality.**
  - Reduce fossil fuel demand at its peak.
- **•No Water Consumption**

Why are we pursuing this project now?

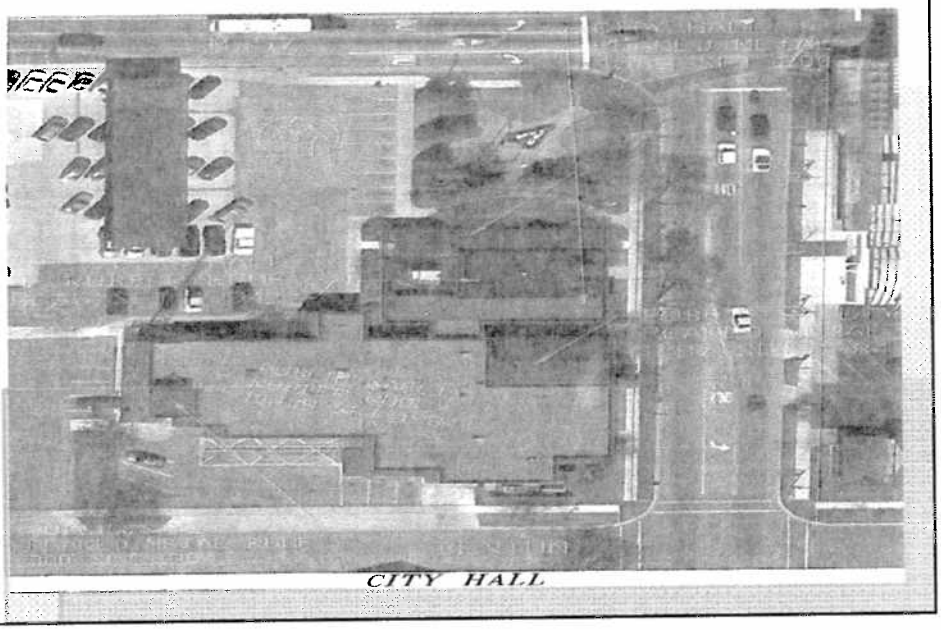
- Job creation- 120 FTE immediately, plus protection of school jobs, potential tax reductions, and commercial jobs that come with that reduction.
- The State of Michigan needs to diversify the economic paradigm in order to change the financial outlook.
- We have the space!



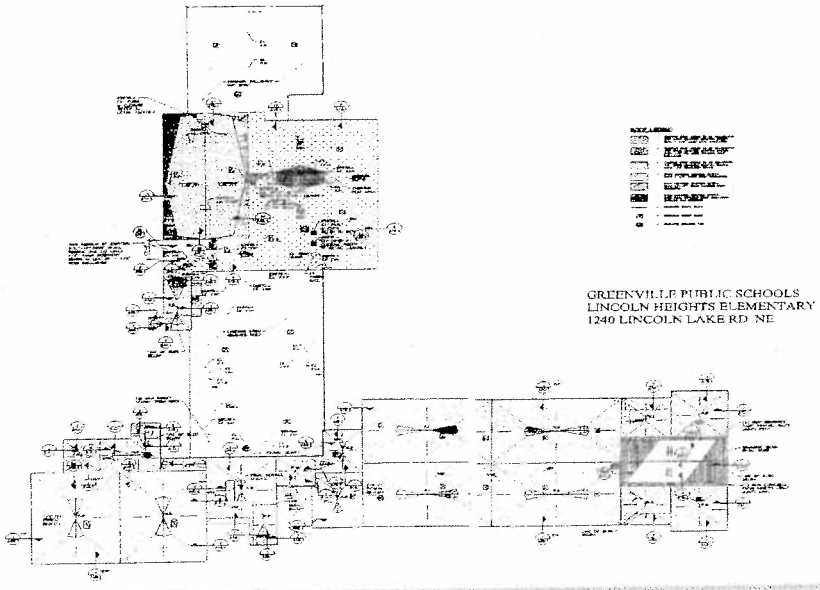
Petersen Solar Field (City of Greenville)



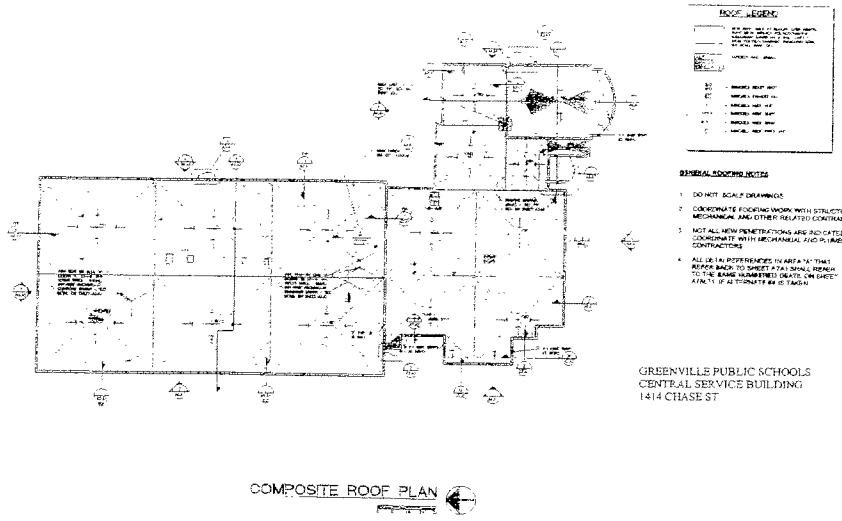
Greenville City Hall



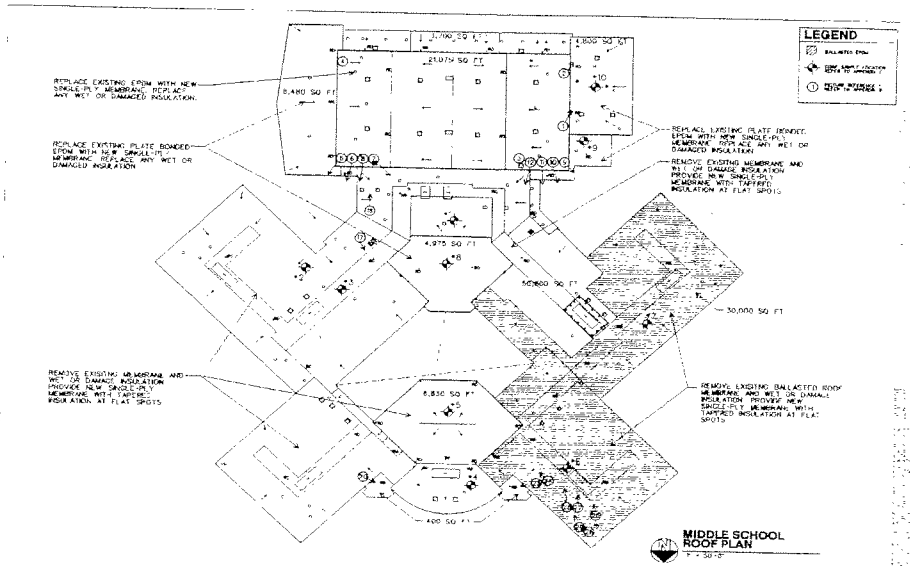
Lincoln Heights Elementary



GPS Central Services Facility



Greenville Middle School



Michigan has an opportunity to lead, but not for long…

- Kansas City – Sustainable Skylines
  - First pilot community chosen for Sustainable Skylines program
  - Locally-led, EPA supported, public-private partnership
  - Multiple projects to reduce air emissions and promote sustainability
  - Solar KC: solar demonstration projects at schools and city-owned buildings to promote renewable, clean energy
- Kansas City – Green Impact Zone - $50M ARRA funds
  - Job creation for unemployed residents
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- Nashville – Volunteer State Solar Initiative - $62.5M ARRA funds
- San Diego – $5M ARRA Funds
  - Balboa Park (3MW)
- Chicago – $48M RELG ($60M investment)
  - 10MW Solar Power Plant

Why Greenville?

- The Greenville project is small enough to accomplish, but big enough to make a difference.
- The total community is already engaged (schools, city government, and commercial entities have formed a public/private partnership) and demonstrates a ***capacity*** for accomplishment.
- The world is already watching Greenville, making this community the perfect showplace.
- By establishing Greenville as a ***training site*** where other communities can observe everything from production to implementation and monitoring, the investment impacts all of Michigan. "Phasing" may make sense, but the need is urgent.

What have we already done?

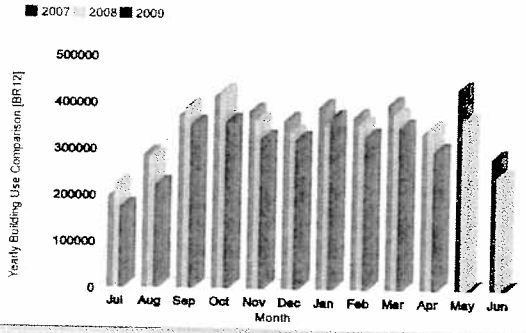
- Implemented audits, monitoring, and conservation strategies (which have reduced use and engaged the community)
- Written and implemented curriculum in our schools
- Installed the technology at our community airport

Our programs are already yielding results:

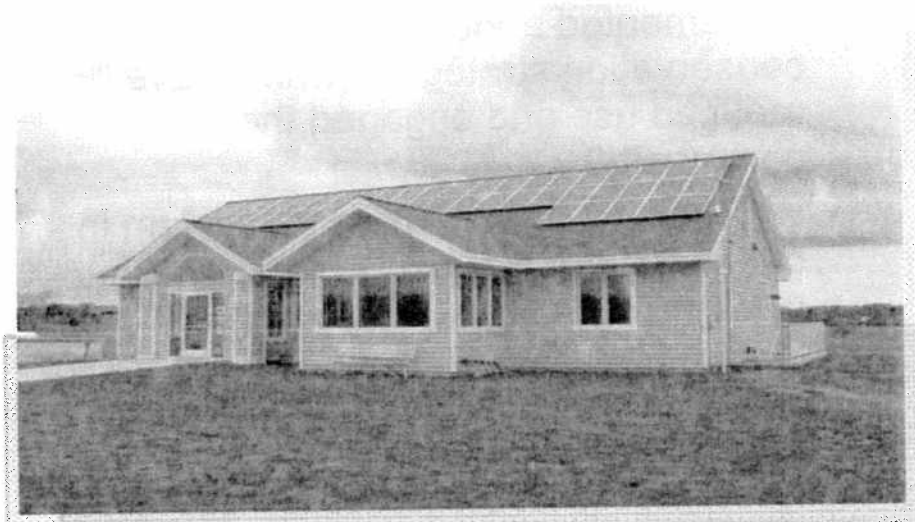
Greenville Public Schools

Yearly Building Use Comparison [BR12]

Building Types:	Administration, Academic
Unit:	KWH
Utility Types:	Electric
Buildings:	High School, Lincoln Heights Elementary, Cedar Crest Elementary, Baldwin Heights Elementary, Walnut Elementary, Central Services, Middle School



Greenville Municipal Airport Project



What else have we done?

- Applied for grants (MPSC)
- Sought funding sources:
  - Federal credits/rebates 30%
  - Potential vendor contributions/discounts (manufacturer, installer(s), Consumers Energy, etc...)
  - Considered QZABs (Qualified Zone Academy Bonds) or CREBs (Clean Renewable Energy Bonds)

What needs to be done?

- Feed-in Tariff (HR 4137 – Gonzales)
- Net Metering (still with MPSC for approval)
- Utility Programs

Thank you…

…for hearing Greenville's plan for the *next* Michigan.

ECD Has a History of Solar Innovation

UNI-SOLAR.

1981: Prototype machine

1986: 0.5 MW machine

1996: 5 MW machine

NREL

1994: NREL validation

1991: 2 MW machine

1997: Building-integrated (BIPV) product

2003: First Auburn Hills facility

2007: Greenville 1 facility

TODAY: Greenville campus expanding to 240 MW

NEXT: Battle Creek, MI 120 MW plant under construction

...based in Michigan

UNI-SOLAR.

Greenville I & II
Manufacturing

Auburn Hills I & II
Manufacturing

Corporate Headquarters
Energy Conversion Devices, Inc.
Rochester Hills, Michigan

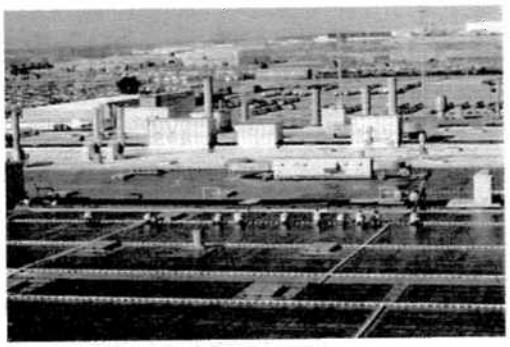
Battle Creek
Manufacturing
(Under Construction)

Troy, Michigan
Global Research & Development

Since 2006, United Solar has increased its Michigan employee base four-fold to approximately 1200

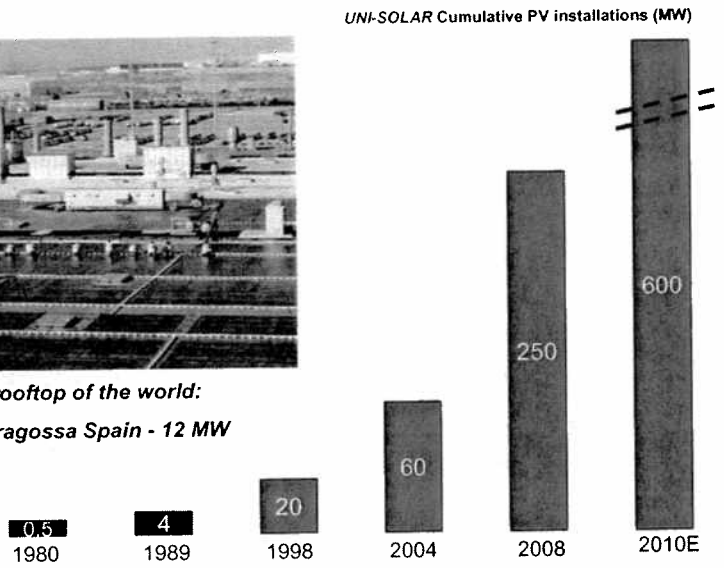
Over 30 Years of Growth on Roof Tops

UNI-SOLAR.



Largest PV rooftop of the world:

GM plant in Zaragossa Spain - 12 MW



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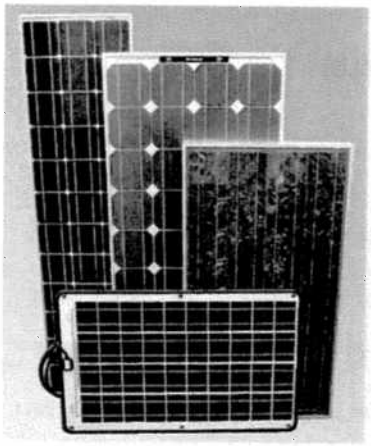
UNI-SOLAR Has Distinct Competitive Advantages

UNI-SOLAR.

Conventional Solar Cells



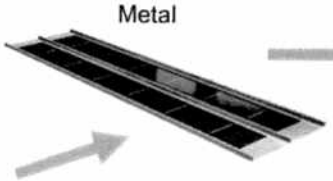
***UNI-SOLAR*® Laminates**

Cost Reductions

UNI-SOLAR.

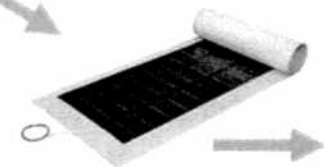
Semi-Finished

Metal



Industry largest PV roofing element (> 500 Wp)

UNI-SOLAR®
Flexible Laminates



Membranes

Prefabrication with
Standard roofing materials

Ease of installation:
Standard roof installation &
no support structures

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Legislature

UNI-SOLAR.

- Federal
  - DOE Funding to State Government through EECBG and SEP
  - Dept of Education Funding to State through State Fiscal Stabilization Funds
    - School Construction/Modernization
    - MI to receive $290M
  - Renewable Energy Loan Guarantees (RELG)
  - 30% ITC
- State of Michigan
  - Feed-In Tariff (HR 4137 – Gonzales)
  - Consumers Energy program
  - Detroit Edison program
  - Net Metering still with MPSC for approval
    - Proposal system size limited to 150 kW for renewable generators
  - RPS: 10% by 2015
    - Need for Carve-out vs. Multiplier
    - Arizona: original encouraged early solar development through double credit provision; chronic non-compliance/dissatisfaction; now 15% by 2025, 30% from distributed energy technologies
    - New Mexico: Original included 3x multiplier; switched to 1.5% DG carve-out by 2011, 3% by 2015

Leading the way...

UNI-SOLAR.

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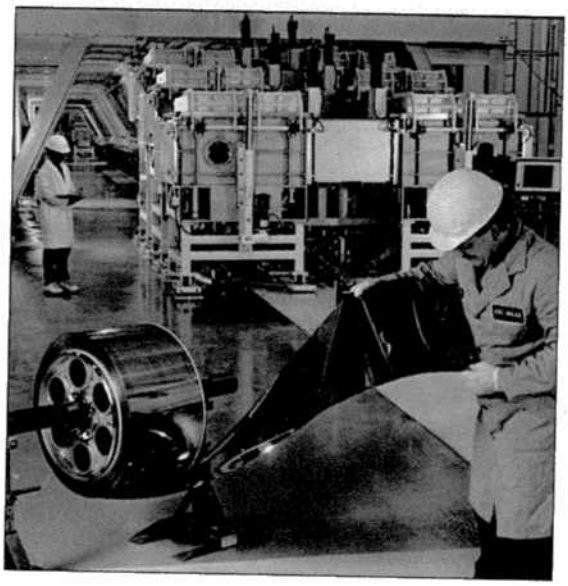
UNI-SOLAR®
A subsidiary of Energy Conversion Devices, Inc.

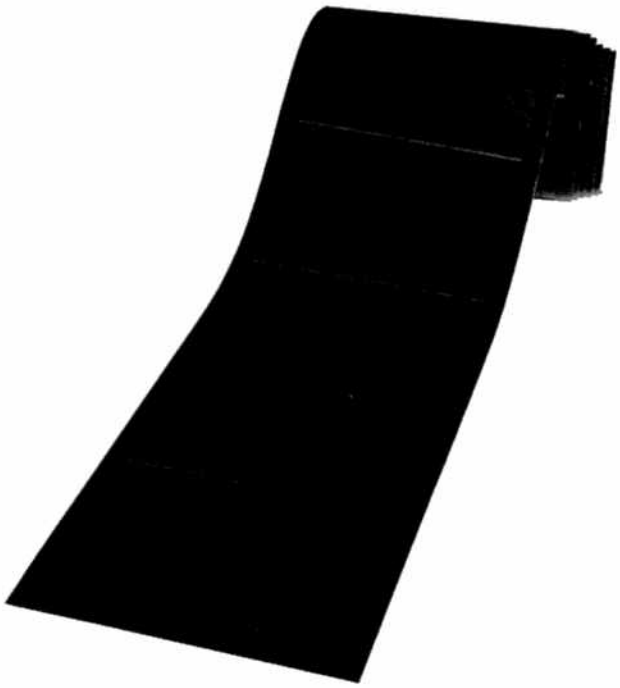
For Every Roof Under the Sun

Value Propositions

- / Requires no roof penetrations
- / Generates more electricity in real world conditions
- / Superior high temperature performance
- / Lightweight, durable, flexible – no glass (<1 lb/ft^2 vs. 5+ for glass)
- / Ideal for rooftop applications
- / Easy and less expensive to install and ship



United Solar has increased employment in Michigan 4x since 2006 to 1200 employees



For more information,
please contact
Nancy Bacon, Senior Advisor
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www.uni-solar.com

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UNI-SOLAR | **For Every Roof Under the Sun**

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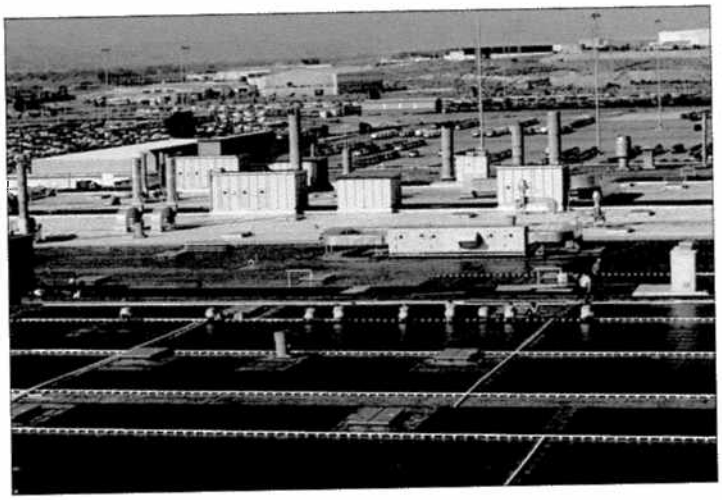
Roof tops are an ideal place to install solar PV systems

/ Roof top solar generates electricity at the point of consumption
/ Better land utilization
/ Reduced strain on our antiquated electrical grid
/ No transmission and distribution losses
/ Less reliance on foreign oil
/ A drop in carbon dioxide production



The World's Largest Rooftop Solar Installation
2 Million square feet of *UNI-SOLAR* laminates

US Army Housing, Oahu, Hawaii
Approx. 1 Million square feet of *UNI-SOLAR* laminates

Michigan Alternative and Renewable Energy Center
Grand Valley State University
2003 | Size 30 kW

Jet Aviation Hangar, Teterboro Airport
Teterboro, New Jersey
2007 | 310 kW

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