

# The Case for Milwaukee-based Solar Hot Water Manufacturing

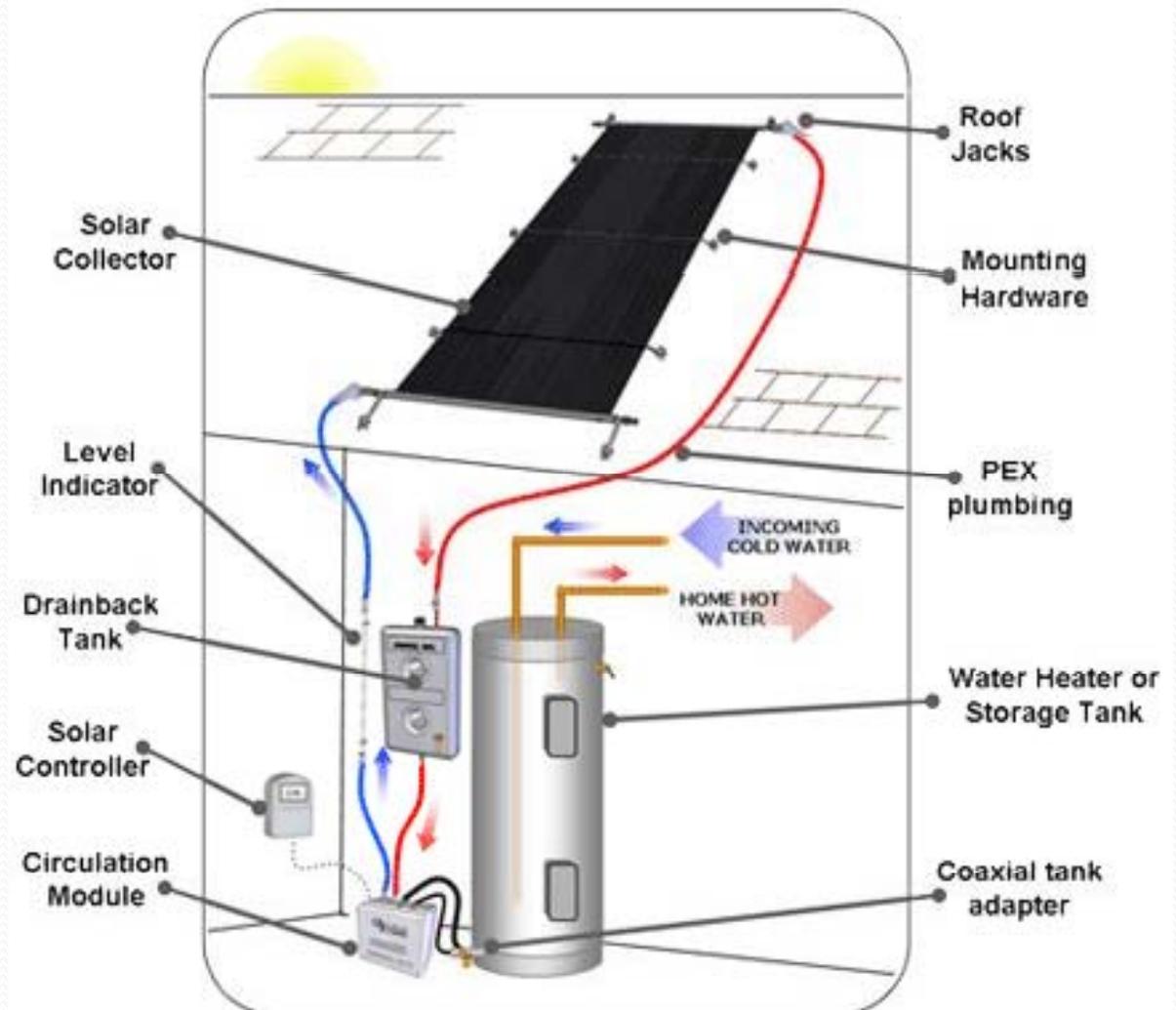
Milwaukee Shines  
Office of Environmental Sustainability  
March 2010

“We are the facilitators of our own creative evolution.” Bill Hicks

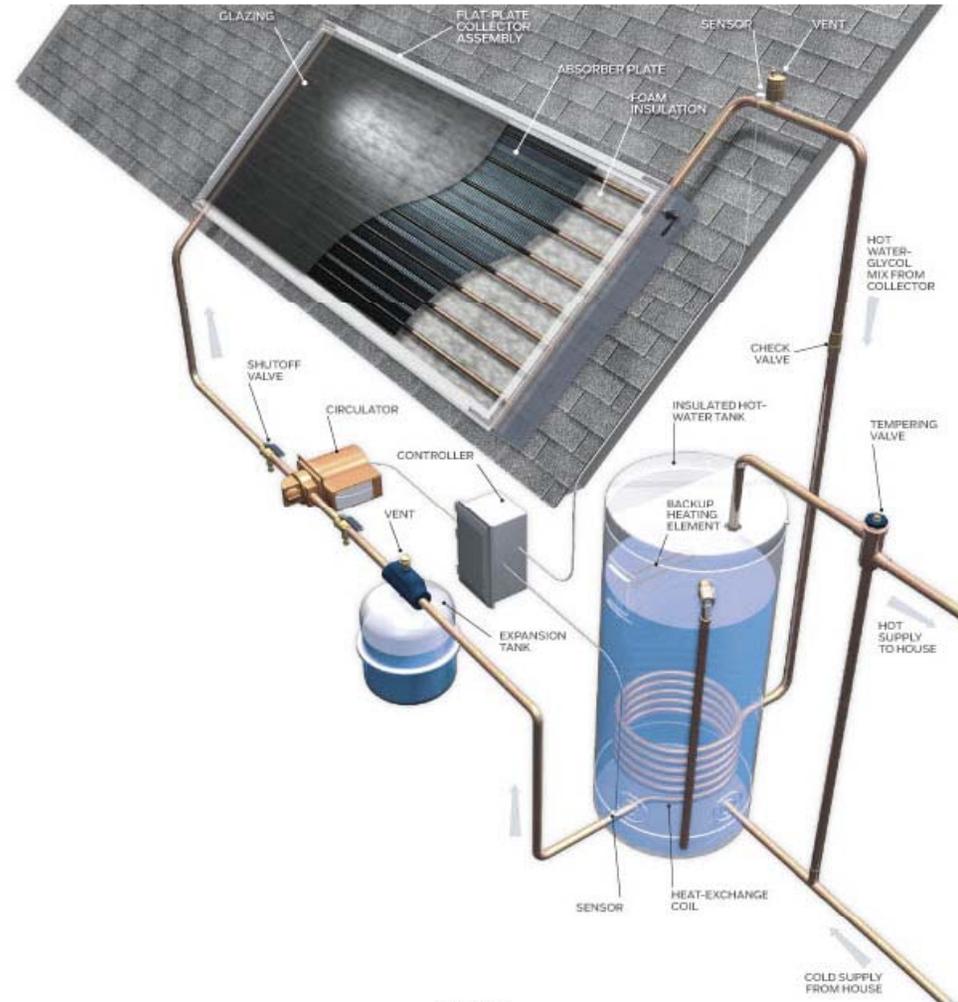
# What is a Solar Hot Water System?

Other solar hot water system components (not shown):

- Heat exchanger (copper or stainless)
- Expansion tank
- Sensors/Gauges
- Valves/Unions
- Flashing/Sealants
- Tubing



# Solar Hot Water Components



*3D View*

*A typical closed solar hot-water system, such as the one shown here, uses a water-glycol mix to transfer heat from a rooftop collector to a heat-exchange coil in a tank.*

# Detailed Components of a SHW System

Gate, globe & ball valves

Check & mixing valves

Fittings

Zone valves

Strainers

Balancing/pressure relief valves

Expansion tanks

Pumps

Rack systems for solar collectors

Air & dirt separators

Solar hot water tanks

Electronic controllers

# These SHW components can be made in Milwaukee!



Milwaukee/Wisconsin SHW

or near-market manufacturers:

Helios

Caleffi

Cardinal Glass

Badger Meter

A. O. Smith



Regional Milwaukee manufacturers  
already make...

- Tanks for hot water heating & other uses
- Heat exchangers
- Pumps

...But not for the solar hot water market

# Part 1: The Solar Hot Water Market

Looking for a market for your products that has staying power and growth potential?

“Between 2005 and 2008, the annual installed capacity of the solar hot water systems in the continental U.S. quintupled”, WSJ 1/28/2010

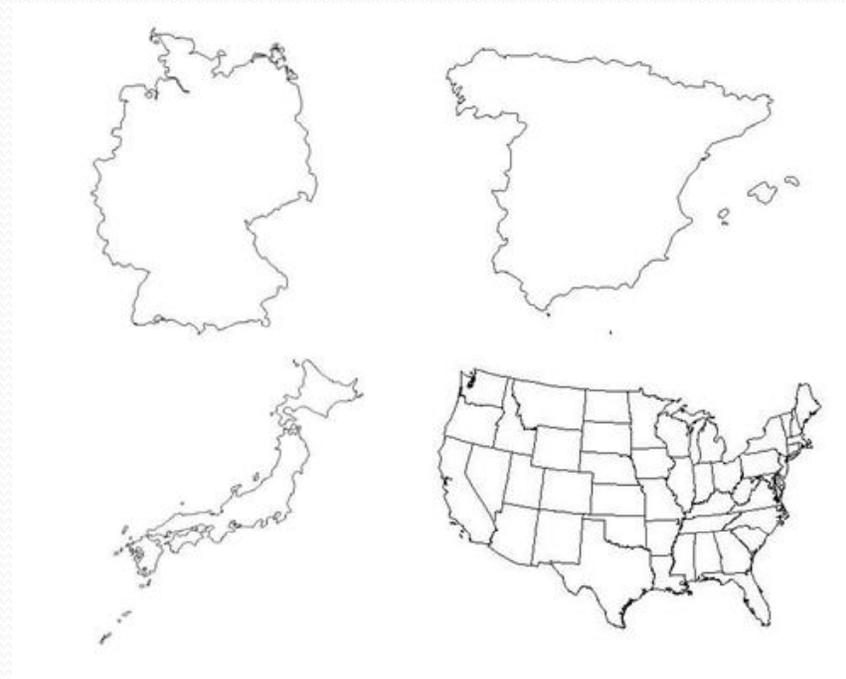
In 2008, the market grew 40%, despite the economy

1 in 10 Chinese households have solar hot water systems

# Where is the Global SHW Market?

Including PV, the top 4 global solar markets are:

- Germany
- Spain
- Japan
- United States



# Leading Export Markets for Domestic Collector Manufacturers

- |    |               |                     |
|----|---------------|---------------------|
| 1. | Canada        | 36% of 2008 exports |
| 2. | Europe        | 23%                 |
| 3. | Mexico        | 20%                 |
| 4. | South America | 17%                 |

Note: Collector shipments used as proxy for overall SHW market. Collector data is more complete & accurate compared to other components. 2008 most recent data

Source for slides 7-12: DOE Solar Thermal Collector Activities, 2008, Released January, 2010

## Leading Domestic Markets for Domestic Collector Manufacturers

1.	Florida	31%	6.	Illinois	2%
2.	California	22%	7.	New York	2%
3.	Arizona	6%	8.	Nevada	1%
4.	Hawaii	5%	9.	Pennsylvania	1%
5.	Oregon	3%	10.	Virginia	1%

**Top 5 states accounted for 65% of 2008 domestic market**

**Top 10 states accounted for 72% of 2008 domestic market**

# The Midwest SHW Market

Midwest defined as WI, IL, MN, MI, IA, IN, OH

In 2008, the Midwest comprised over 5% of domestic collector shipments.

Shipments in order: IL, MN, WI, OH, MI, IN, AI

Wisconsin includes or borders the 3 biggest Midwest markets. WI shipments nearly doubled between 2007 & 2008.

80% of the Midwest SHW market within a 5 hour drive of Milwaukee.

# Who is MY SHW Customer?

Many manufacturers are also distributors

Many wholesalers/distributors of SHW components who bundle into turnkey systems

Direct sales to solar installers

Internet sales to DIYers

## Part 2: Why should I retool to manufacture SHW components in the M7 Region?

CH2MHill July, 2009 report lists these reasons:

- Existing manufacturing and engineering base
- Skilled manufacturing work force
- Applied research focus of universities
- Engineering programs within the cities three universities
- Abundant, high quality water supply
- Competitive electricity rates
- Transportation and distribution channels and facilities
- Public /private entities enthusiastic and supportive of creating solar product
- Milwaukee area companies already involved in parts of solar product supply chains – Helios, A.O. Smith, Cardinal Glass, Caleffi
- We Energies commitment to developing solar generation
- Federal, state and city incentives

Source: Solar Products Manufacturing in Milwaukee, CH2MHill, July, 2009, slides 13-15



## Milwaukee regional workforce knows how to “bend metal”

### **Job skills required for SHW manufacturing:**

Sheet metal worker

Materials Science

Technician

Material Handler

Assembly

Factory Supervisor

Mechanical Engineer

Manufacturing Engineer

Manufacturing Manager

Distribution/Sales

### **Raw materials required:**

Copper, aluminum, steel, glass

**No exotic processes, unlike solar electric (PV)**



## Solar Product Manufacturing Opportunities in M7 region

**With the region's strength and expertise in metals manufacturing and a skilled work force, the most immediate opportunities are in:**

- Manufacturing of fittings and valves for SHW systems
- Forming and assembly of frames for SHW collectors
- Manufacturing of mounting systems for SHW collectors
- Manufacturing of tanks for SHW systems for specialty and high performance applications
- Note: no recommendation to make collectors at this time

**The region's strength and experience in electronics creates related opportunities that include:**

- Controllers for SHW systems

Source: CH2MHill, July, 2009



## Federal, state & local SHW retooling assistance

- Federal, state, local governments can offer deep financial and technical assistance... more than you can imagine
- A major component of new job growth is **green job** creation and the federal and state governments are backing green manufacturing with millions of \$\$ of grants and loans. The economic stimulus funding has a very major renewable energy component.
- The Mayor's Office of Environmental Sustainability, Milwaukee Shines and the Department of City Development want to work with your company in creating green jobs within the City. Track record: the Menominee Valley redevelopment; the potential of the 30<sup>th</sup> St. Corridor

# Milwaukee/WI SHW Financial Incentives Providers

- We Energies



- Focus on Energy



## Milwaukee/WI SHW Education Partners

- Midwest Renewable Energy Association
- Wisconsin Green Building Alliance
- Southeastern Wisconsin Energy Technology Research Center
- Milwaukee Area Technical College
- Energy Center of Wisconsin
- Big Step



*we've got your back*

# Federal Assistance

- Business Energy Investment Tax Credit (ITC)
- US DOT Renewable Energy Grants
- Advanced Energy Manufacturing Investment tax Credit
- Residential Renewable Energy Tax Credit
- DOE Recovery Act Funding:
  - \$4 billion in loan guarantees for renewable energy
  - \$16.8 billion for energy conservation and renewable energy
  - Jan. 8, 2010 – Obama awards \$2.3B in AE tax credits to 183 companies

Source: Dept. of Energy website, [energy.gov](http://energy.gov); [dsireusa.org/solar/incentives](http://dsireusa.org/solar/incentives)

# WI Promotion of Green Manufacturing

- Green to Gold Fund - \$100MM (proposed)
- Clean Energy Business Loan Fund - \$55MM
- Doyle grants \$14.5 Million in energy awards to 9 WI companies for energy efficiency
- 12/11/09: Doyle announces \$3.1M to Milwaukee companies to create green jobs
- Small Business Development Centers

Wisconsin wants to start/keep/grow your green-tech SHW business!

Sources: [JOnline.com](http://JOnline.com), [recovery.wisconsin.gov](http://recovery.wisconsin.gov), [commerce.wi.gov](http://commerce.wi.gov)

## Proposed WI Green Jobs Legislation from January, 2010 alone

- Jan 26, 2010: Doyle announces Green to Gold Fund - \$100MM revolving loan fund to help WI manufacturers reduce their energy costs
- Jan 21, 2010: WI state Senate passes CORE Jobs Act (32-1 vote) which will increase tax credits for investors in early-stage companies and provide \$2MM for incentives to re-open shuttered factories for renewable energy manufacturing
- Jan 6, 2010: Wisconsin Clean Energy Jobs Act
  - 20% state renewable portfolio by 2020, 25% by 2025

**WISCONSIN WANTS GREEN JOBS NOW!**

Sources: [jsonline.com](http://jsonline.com), Doyle [State of the state speech](#)

# City of Milwaukee Assistance

- **Office of Environmental Sustainability**
  - Solar Hot Water Business Council
  - *Milwaukee Shines*
- **Department of City Development**

can all help in their specialties of:

Business start-up, TIFs, business planning assistance, solar market research, job creation tax credits, water subsidies (due to the M7 Water Council)

# Growing your Green-Tech business – the possible steps in the process

Join Solar  
Hot Water  
Business  
Council!

Your  
Business  
Plan

SHW  
Business  
Council  
advice

Focus on  
Energy/We  
Energies  
incentives

- Commercial energy efficiency
- SHW incentives

M7 local gov't  
development  
assistance

- e. g. Milwaukee DCD
- DCD source of:
  - Grants,
  - permits,
  - loans,
  - location assistance

WI Commerce  
Dept:

- \$55MM Clean Energy Business Loan Program (“CEBLP”)



## WI Commerce Department Clean Energy Business Loan Program

\$55MM Funding for Clean Energy Business Loan  
Program (“CEBLP”)

- CEBLP targets low-interest loans (2% fixed rate) to business promoting:
- Re-tooling for the manufacture of renewable energy products
- The manufacture of clean energy products
- Terms: 5-10 years, loan up to 25% of project cost

# Resources

- Solar Hot Water Business Council Champions
  - Johnson Controls
  - A O Smith
  - Caleffi
  - Hot Water Products
  - UWM
  - And many more...
- City of Milwaukee, Office of Environmental Sustainability – Milwaukee Shines
  - Andrea Luecke [aluecke@milwaukee.gov](mailto:aluecke@milwaukee.gov) (414) 286-5593
  - [www.MilwaukeeShines.com](http://www.MilwaukeeShines.com)
- Dept. of City Development
  - Marcia Theusch [mtheus@milwaukee.gov](mailto:mtheus@milwaukee.gov) (414) 286-5839
  - [www.mkedcd.org](http://www.mkedcd.org)