



**CONERGY**

**Clean Power for Portfolios  
Upstream, Downstream, Nanostream**

**September 2009**

# Photovoltaics Case Study

| From niche applications to mainstream supplier of clean energy



## Path to success for Cleantech – Lower Cost/Lower Consumption

- | Cleantech is an attractive field for research and discovery
  - | It has an established and robust market

- | Case Study: Polysilicon Photovoltaics

- | Wafered silicon's past
  - | Continual cost reduction
- | Wafered silicon's future
  - | Continual cost reduction



- | If you can produce energy with less cost or consume energy more efficiently and achieve the same ends, you win with economics.

## Conergy's Prospective on Microsystems - Applied to Photovoltaics

| Let's look at some recent innovation that have made their way to the market

| SunPower

| FirstSolar

| Sanyo

| Enphase



SUNPOWER



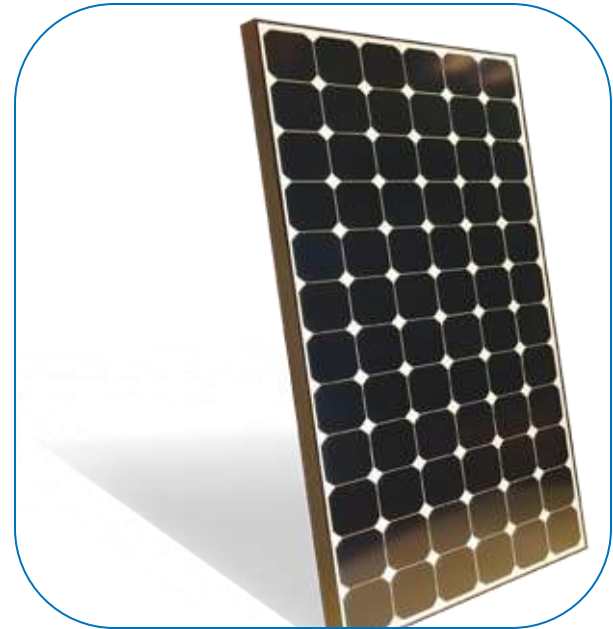
SANYO



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# SUNPOWER

- | Conductive aluminum stripping on back side of modules exposing more semi-conductor material to the sun
- | Most efficient cells available





- | Different semiconductor = CdTe (Cadmium Telluride)
- | Lower production costs
- | Less susceptible to temperature increases
- | More electricity in low and ambient light



**SANYO**

- | Combines highly efficient silicon wafer with thin film technology
- | Multiplies productive surface area 2X



- | Micro Inverter
- | Reduce adverse effects of shading
- | Simplifies installation



## Prospects for the future of Photovoltaics - Microsystems and Nanotechnology

- | Efficiency of surface area
  - | Increase light absorption
  - | Increase active surface area
  
- | Less material
  - | Light concentration
  - | 'Sliver' Cells
  
- | New materials
  
- | Flexible materials
  
- | Micro-scale power conversion



**Thank you for your attention.**

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