



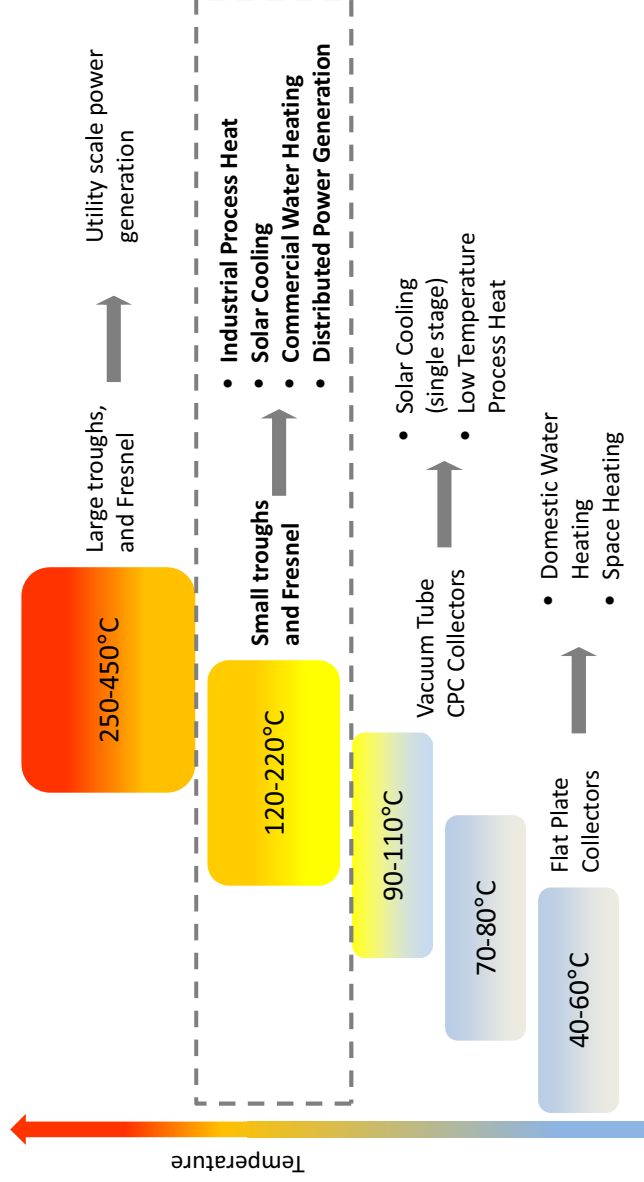
Solar process heat potentials and applications – a chance for concentrating collectors

SolarPaces 2009 Workshop on Medium Scale Solar Thermal Power

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NEP Solar focuses on process heat for industry, an emerging sector



Our current product is the result of a four year design and improvement process, rewarded by the 2009 Intersolar AWARD in category solar thermal



2005 Concept



2006 Prototype 1



2007-08 Prototype 2

Two commercial projects signed and in execution, installation for November 2009



2009 ...



2009 Commercial

NEP SOLAR's new PolyTrough 1200 and 1800 collectors innovate along a number of key design dimensions leading to lower life cycle costs



- Innovative and proprietary composite carrier reflectors
 - Object/group based design
 - Torque tube approach
- ▶
- ▶ Higher annual yields
 - ▶ Lower cost in shipping and installation
 - ▶ Ease of operations & maintenance
 - ▶ Longevity structurally and in performance
 - ▶ Scalable Design

Case Study 1 – Pharmaceutical Plant

Site	
Client	Confidential
Location	Jakarta, Indonesia
Latitude	-6.3°
Radiation (DNI)	~1300 kWh/m ²
Site Rating	
Process	
Temperature Range	150°C to 180°C
Fluid	Water
Solar field size	6912 m ²
Net Annual Efficiency	
Yield Rating	
Financial	
Total Invest	
Specific Invest	
Subvention	None
Fossil Fuel Price	n.a.
Economic Drivers	
Estimated Payback	n.a.
Other Motive	LEED Platinum Rating
Project Likelihood	

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Case Study 2 – Textile Plant

Site	
Client	Confidential
Location	Toluca, Mexico
Latitude	19.3°
Radiation (DNI)	~1500 kWh/m ²
Site Rating	
Process	
Temperature Range	150°C to 220°C
Fluid	Oil
Solar field size	2880 m ²
Net Annual Efficiency	
Yield Rating	
Financial	
Total Invest	
Specific Invest	
Subvention	None
Fossil Fuel Price	0.035 €/kWh
Economic Drivers	
Estimated Payback	> 10 years
Other Motive	
Project Likelihood	

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Case Study 3 – Chemical Salt Processing (Mining) Site

Site	
Client	Confidential
Location	Atacama, Chile
Latitude	-22.3°
Radiation (DNI)	~2800 kWh/m ²
Site Rating	
Process	
Temperature Range	100°C to 180°C
Fluid	Water
Solar field size	1150m ²
Net Annual Efficiency	
Yield Rating	

Financial	
Total Invest	
Specific Invest	
Subvention	None
Fossil Fuel Price	0.086 €/kWh
Economic Drivers	
Estimated Payback	4.4 years
Other Motive	
Project Likelihood	

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Case Study 4 – Feed Water Preheating For Biomass Power Plant

Site	
Client	Confidential
Location	Guadeloupe
Latitude	16.2°
Radiation (DNI)	~1550 kWh/m ²
Site Rating	
Process	
Temperature Range	80°C to 180°C
Fluid	Water
Solar field size	6134 m ²
Net Annual Efficiency	
Yield Rating	

Financial	
Total Invest	
Specific Invest	
Subvention	None
Fossil Fuel Price	0.07 €/kWh
Economic Drivers	
Estimated Payback	8.5 years
Other Motive	Greenpower
Project Likelihood	

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Key Learning to Date

- ▶ It's a multi-variable optimization issue – only the best combination of site parameters will be viable in the current climate
- ▶ Integration costs are high compared to field costs especially for smaller projects, often jeopardizing the viability of the projects
- ▶ Certifications like the LEED motivates clients to invest in integrated solar solutions
- ▶ Contracting will open many markets for solar process heat and cooling

Continuous mirror surface reduces gap and shading losses

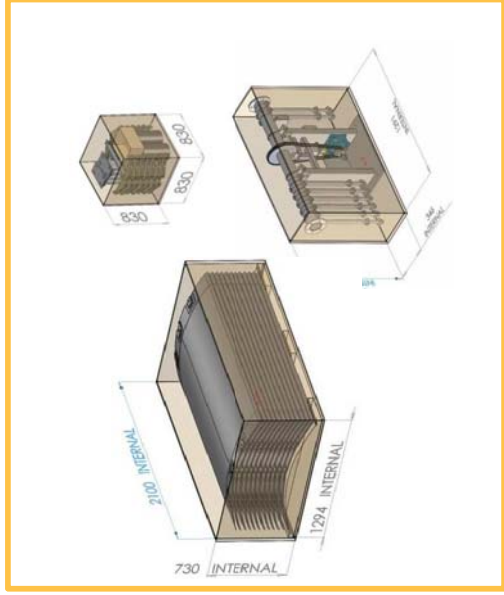


Problem with current technology:
Gap losses and shading



NEP Solar solution: continuous mirror surface

Composites allow for thin structures, greatly easing transport volume and handling

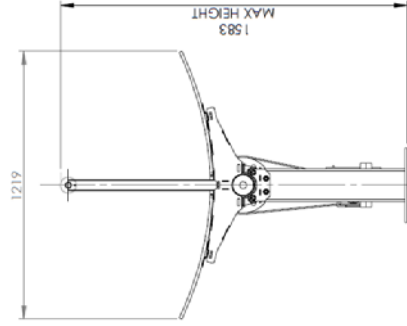


NEP Solar: Ultra-compact transport volume due to unique composite reflector design

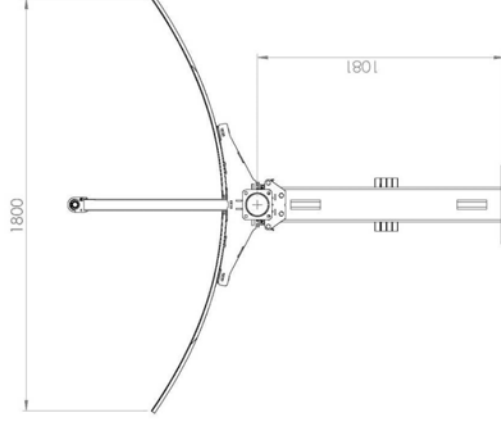


Problem with current technology: Preassembled 3D reflector structure takes up a multiple of storage and transport volume

Design is scalable – PolyTrough 1200 is on the market, the PolyTrough 1800 soon



PolyTrough 1200 for roof-mounted applications to 220°C



PolyTrough 1800 for roof- or ground-mounted applications to 250°C