



Megawatt Solutions Private Limited

Indigenous Innovations In Solar Thermal

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Managing Director and CEO

The Forgotten Solar: Solar Thermal and Its Development
Center For Science and Environment
New Delhi, February 4, 2016



About Megawatt Solutions Pvt. Ltd. (MWS)

- MWS is an Integrated Technology and Solutions Company which provides Efficient Energy Solutions for Heat & Power requirements
- Indigenously Developed and Patented Proprietary Thermal & Power Solutions Offering for commercial, industrial & institutional customers
- MWS Systems Qualify for Subsidy from MNRE*
- Turnkey Supplier of Efficient Thermal & Power Solutions providing Design, Engineering, Manufacturing and Turnkey Delivery
- A vast experience and reference base of projects across India, including India's largest Concentrated Solar Thermal Industrial Heating System in Gujarat

* Ministry of New and Renewable Energy, Government of India



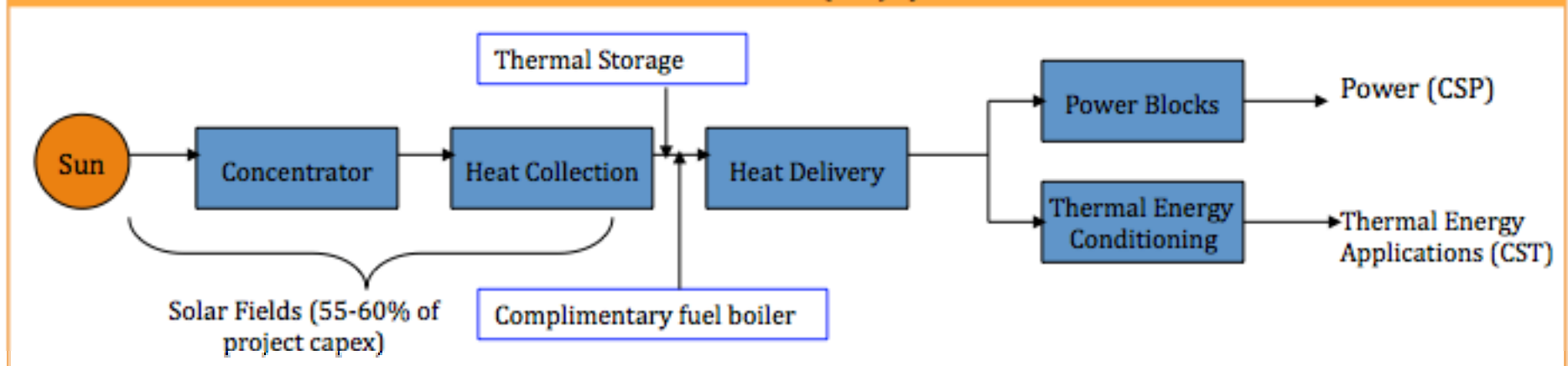
Agenda

- “Forgotten Solar Thermal”- Lets Find Out Why
- Megawatt Solutions CST Solutions
- Opportunities Ahead

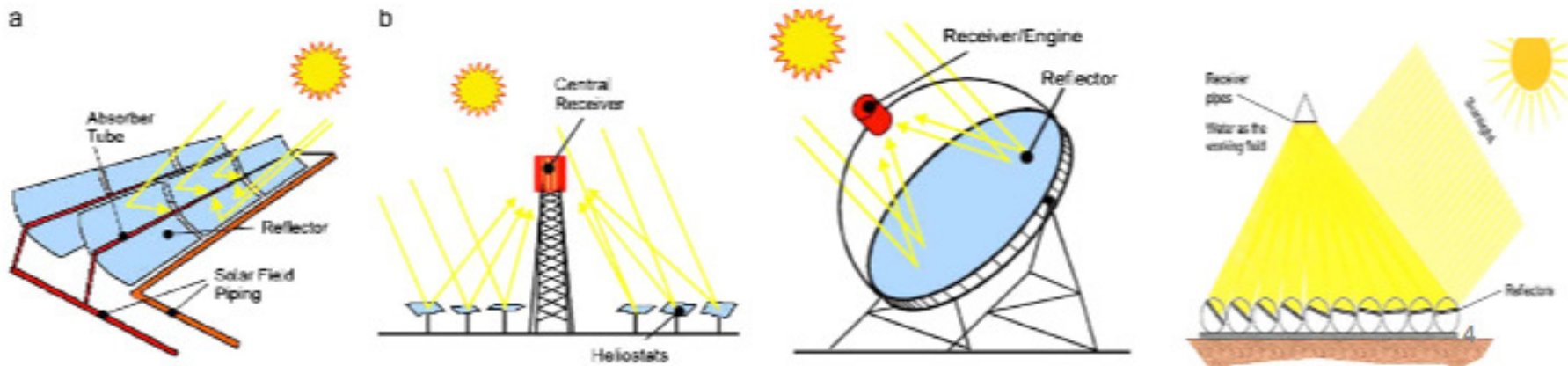


Concentrated Solar 101

Concentrated Solar Thermal (CST) System Overview

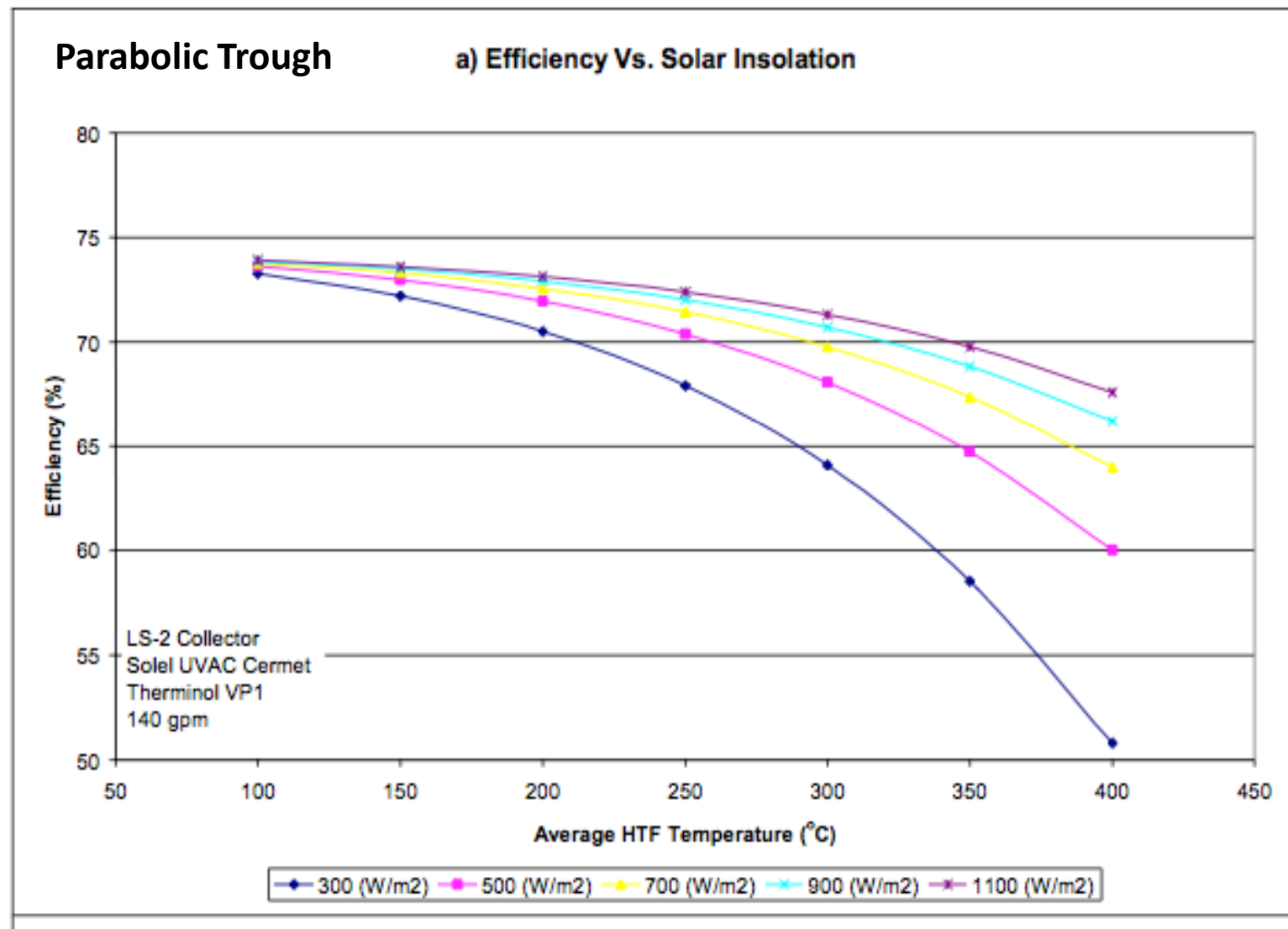


Technology Classified According to Collector and Receiver Types





CSP– Technical Missing Link Overlooked?

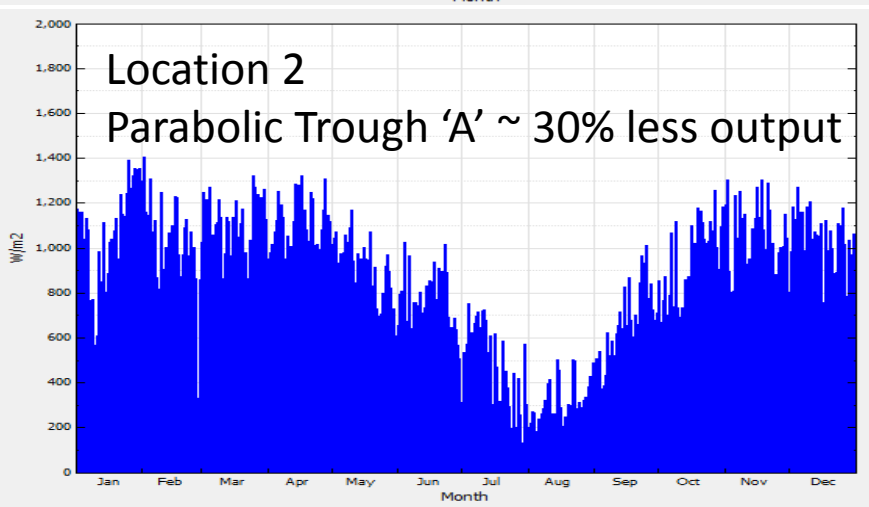
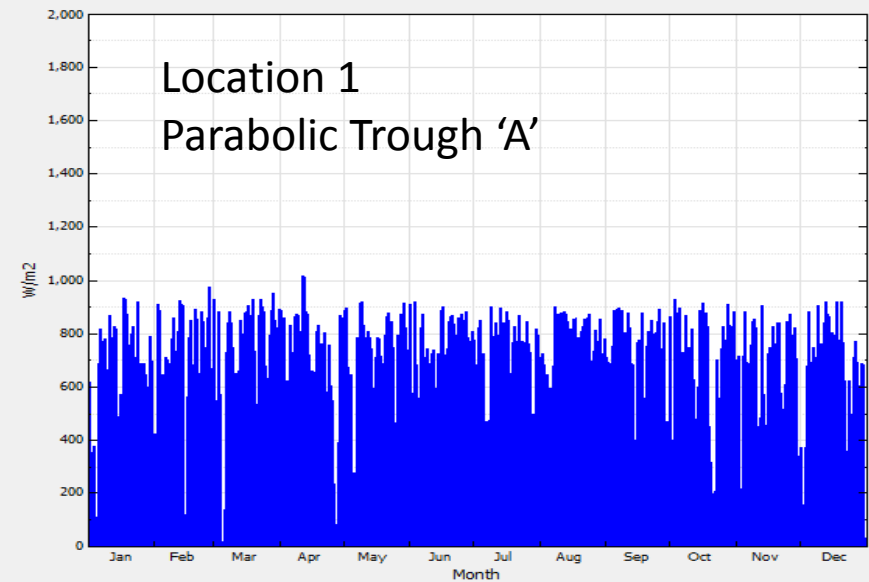
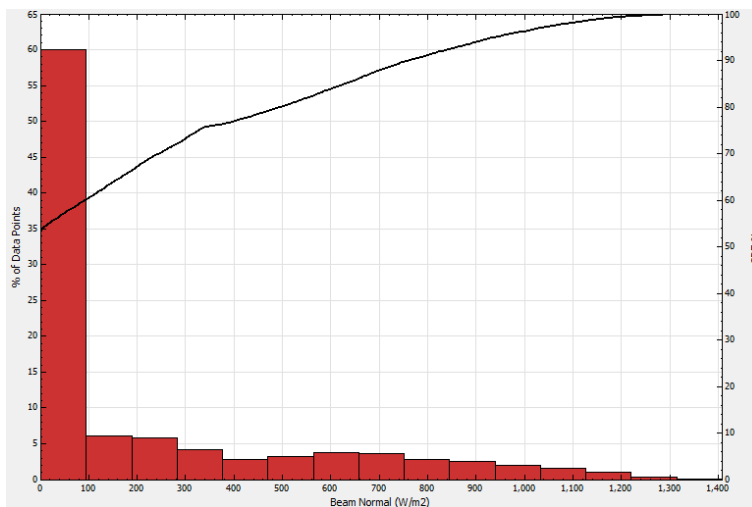
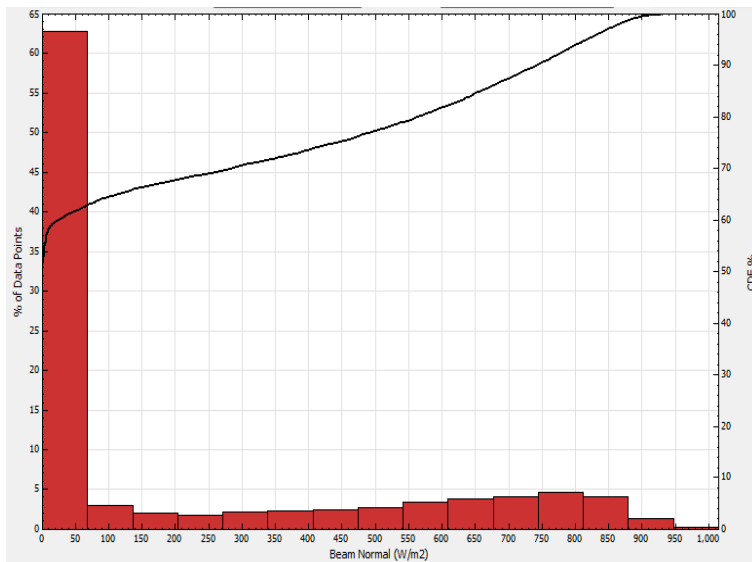


Reducing Industrial Carbon Footprint

Critical Importance Of Technology Suitability



Two Locations Across Globe May Have Similar Cumulative DNI ~ 1600 kWh/m²/yr



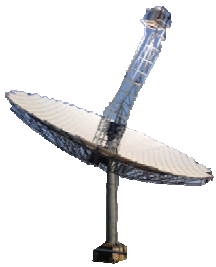
Both Quality and Quantity of DNI Are Critical For Particular CST Technology



MWS Solutions Offerings



Heat

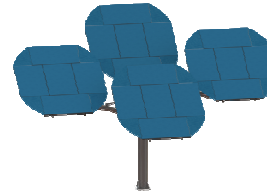


MWS Solar Field™

For Industrial Process Heating Applications



Power



MWS SmarTree™

For Smart Cities, Malls, Public Parks, Plazas, etc.



MWS Smart Kitchen™

For Industrial & Institutional kitchens



MWS SmarTrack™

For high yield offgrid & utility scale Power Plants

Smart Solutions • Smart Energy • Smart Planet

MWS Solar Dish Concentrator

For Reducing Fuel Consumption In Industries



Heating • Cooling • Cooking • Power Generation



Dishes take very small
ground space



System Cost covered in
less then 3 years



Can be retrofitted to
any existing system



Fully automated
systems



Can heat up to 400°C



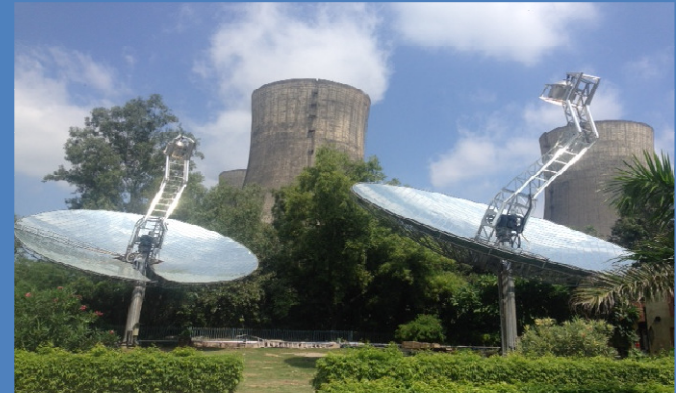
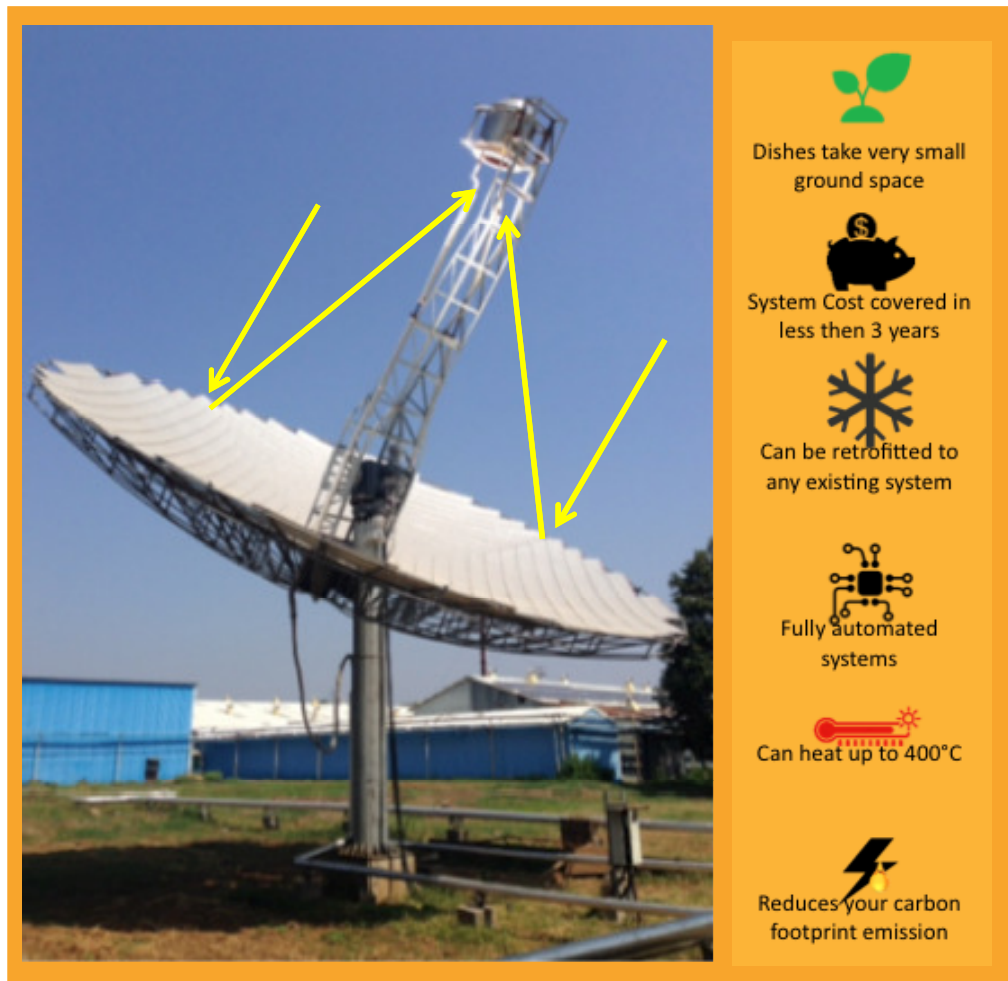
Reduces your carbon
footprint emission

Reducing Industrial Carbon Footprint



MWS Solar Dish Concentrator

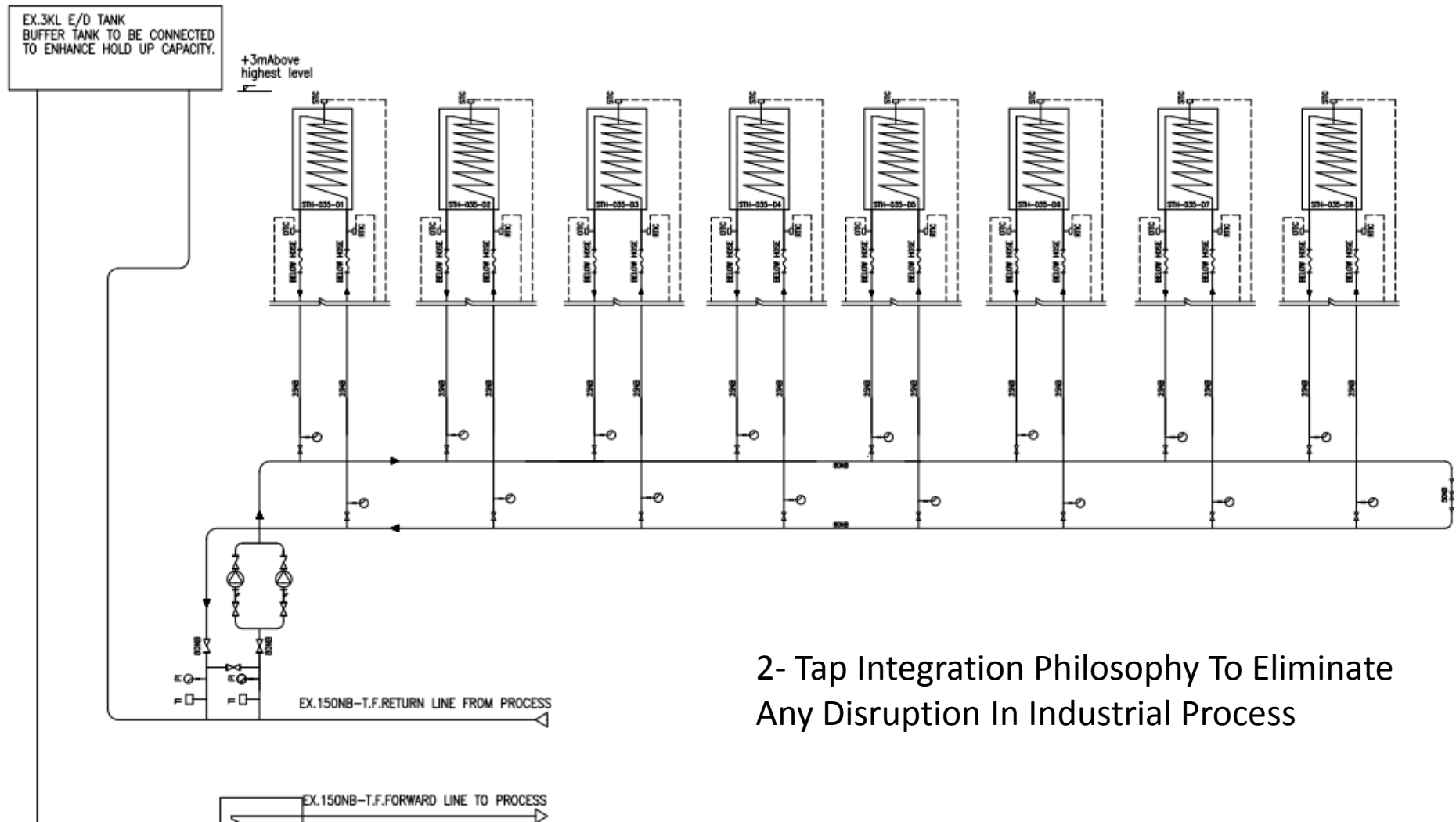
For Reducing Fuel Consumption In Industries



1. Incoming Solar Radiation gets concentrated by high efficiency MWS Paraboloid Dish Concentrator onto a cavity receiver with minimum losses
2. The concentrated energy is heat-transferred to various working fluids like hot water, Thermic Oils, etc.
3. Piping system routes energy from each receiver to end application for integration
4. Entire process is fully automated and dish tracks the Sun in two axis all year long

Reducing Industrial Carbon Footprint

MWS Solar Dish Concentrator Is Practically Feasible



2- Tap Integration Philosophy To Eliminate
Any Disruption In Industrial Process

Reducing Industrial Carbon Footprint

MWS Solar Field™



Creates Long-Term Value In Industries

Application	M95	M55
Hot Water (90°C, $\Delta T = 30^\circ\text{C}$)	10,000 liters	5,000 liters
Steam Generation	450 kg	225 kg
Cooking	1500 meals	750 meals
Hot Air (120°C)	800 cfm	400 cfm
Effluent Evaporation	500 liters	250 liters

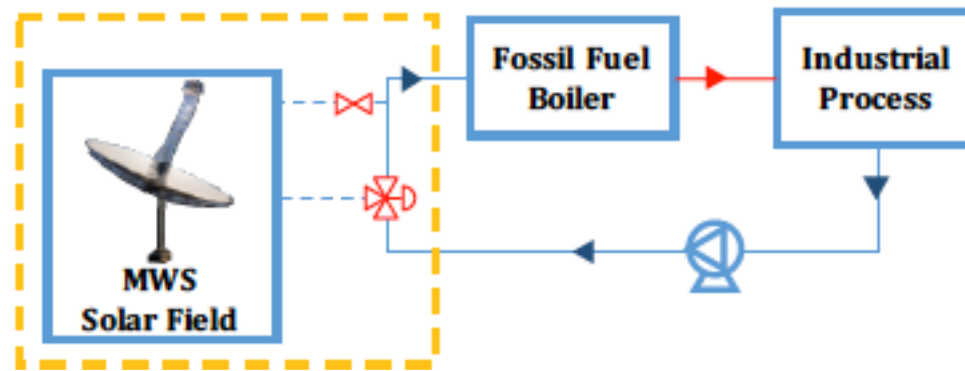
Fuel Type	Fuel Saved per day	Fuel Cost (Rs./unit)	Savings (Rs./day)
Electricity	290 kWh	8	2,326
Diesel	26 Liter	52	1,354
Furnace Oil	25 Liter	26	676
Coal	62.5 kg	8	500
LPG/Natural Gas	35 kg	60	2,100

Clean Industrial Processes for Sustainable Manufacturing

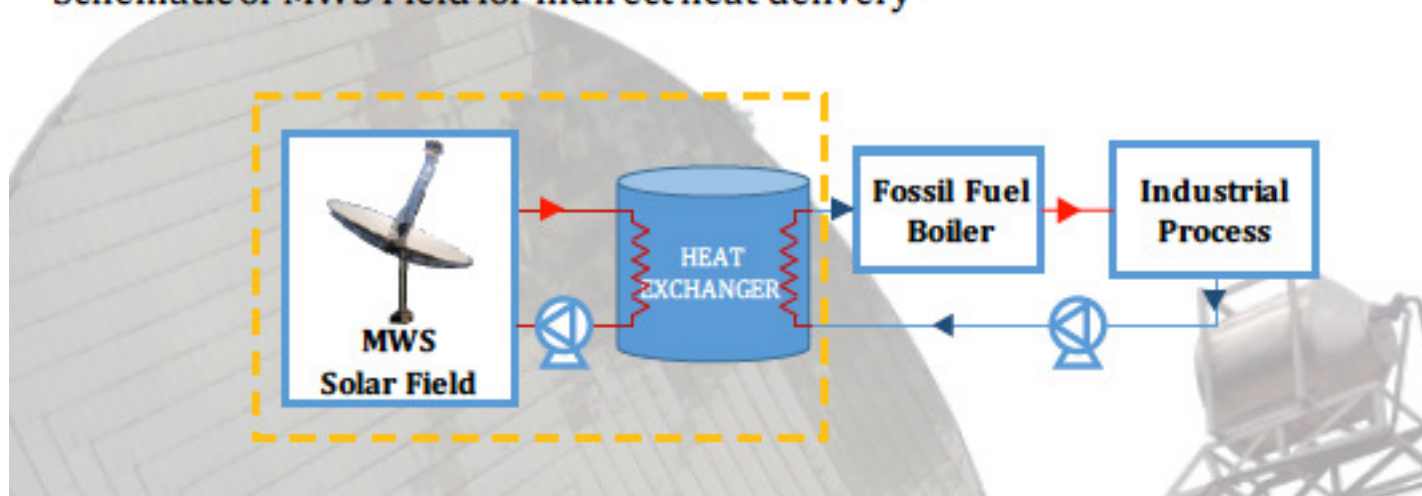


MWS Solar Field™ Integration In Industries

Schematic of MWS Solar Field for direct heat delivery



Schematic of MWS Field for indirect heat delivery



Clean Industrial Processes for Sustainable Manufacturing



Road Ahead For CST

- Proper Mapping of CST Potential Across Industrial Clusters In India
- Towards Standardization Of Applications At Industry Level (Pharma, Rubber etc.)
- Renewable Heat Certificate Mechanism for Level Playing Field for PV and CST
- Continue Great Work By MNRE and UNDP-GEF



ENERGY . RISING



SAMPLE REFERENCE PROJECT LIST OF CST HYBRID PROJECTS DESIGNED, ENGINEERED, DELIVERED AND COMMISSIONED BY MEGAWATT SOLUTIONS PRIVATE LIMITED

S No.	Project Location	Configuration	MWS Concentrator Model
1	Vadodara, Gujarat	CST + Biomass	M90
2	Waghodia Gujarat	CST + Diesel	M55
3	Medak, Telangana	CST + Coal	M90
4	Turkapalli, Telangana	CST + Furnace Oil	M90
5	Madanpalli, AP	CST + LPG	M55
6	Vijaywada, AP	CST + Biomass	M55

Model M90 Paraboloid Dish Concentrator: Rating 40,000 kcal/hr at 750W/m² DNI



THERMIC FLUID HEATING SYSTEM , SAVLI, VADODARA, GUJARAT

CAPACITY: 6 LAC KCAL/HR

CONFIGURATION: 16 nos. of M90 dishes in parallel to provide 6 lac kcal/hr of heat at 250degC of operating temperature



THERMIC FLUID HEATING SYSTEM , SAVLI, VADODARA, GUJARAT
CAPACITY: 6 LAC KCAL/HR







THERMIC FLUID HEATING SYSTEM , TELANGANA

4 nos of M90 dishes integrated to provide 1.6 lac kcal/hr at 180degC



THERMIC FLUID HEATING SYSTEM , TURKAPALLY, TELANGANA

5 nos of M90 dishes to provide 2 lac kcal/hr of energy in form of Thermic fluid at 180degC



THERMIC OIL HEATING SYSTEM, HYDERABAD

6 dishes each of 90m² to provide 2.5 lac kcal/hr of heat at 200degC



Performance Measurement System



MWS Solar Field™ consists of all required sub-systems for performance measurement to establish the daily solar energy yield. These include measuring solar radiation, fluid flow, wind, temperature etc. This is fully remotely-accessible over GPRS/GSM. This ensures complete transparency and field-data verification.





Megawatt Solutions Private Limited



Clean Energy For All

Contact us

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