



HATSUN AGRO PRODUCT LTD

**SOLAR HEAT FOR DAIRY PROCESSES –
ICECREAM & MILK POWDER PLANT**

PRESENTED BY

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HATSUN AGRO PRODUCT – RENEWABLE ENERGY

- Hatsun Agro Products (HAP) is committed to the target of sourcing 100 % renewable energy. “Our mission to make the world a better place for future generations is at the core of our business strategy.
- HAP company today meets 92 per cent of its electricity demand from renewable sources.
- The business’s efforts to introduce industrial solar steam to production in Salem. It also stated that use of “this technology will be expanded to every suitable Hatsun factory to protect the environment.”

HAP - RENEWABLE SUMMARY	
PROJECT NAME	CAPACITY
WIND POWER PLANT	24 MW - (12*2 MW)
SOLAR PV POWER PLANT	1*1700kW & 1*500 kW &1*180 kW & 1*120kW
SOLAR CPC BASED HOT WATER	25000-35000 LPD @90 Deg C
SOLAR PARABOLIC BASED STEAM GENERATION	1500-2000 kg/Day @ 18-20 Bar



HATSUN AGRO TO USE SOLAR STEAM TO MAKE ICE-CREAM & MILK POWDER

- India's First-ever Commercial Concentrating Solar Thermal Plant, Which Consists Of Parabolic Trough Collectors Made By German Supplier Protarget in partnership with Indian-based project developer Luit Renewable.
- The companies installed two 96-metre-long rows of parabolic trough with 320 kW (Solar Steam – 350-400 kg/h at 220 °C and 18-20 bars pressure) of thermal capacity. They commissioned the system on 2018 and Has Been Running.
- Protarget began developing the HTF in partnership with German-based Wacker Chemie. Traditional Mineral oil based HTF hydrogen will dissipate through the absorber tube into the vacuum of the solar receiver and lower efficiency in the process. This effect is significantly reduced when using silicon-based HTFs and Environmentally friendly and Non-Toxic.

SOLAR PARABOLIC TROUGH SYSTEM

- The Solar Parabolic trough system, works by the parabolic mirrors concentrating the sunlight onto a tube that carries a 'heat transfer fluid' which gets heated up quickly. The heat is then transferred in a heat exchanger to water, which becomes steam. The steam is piped to the ice-cream plant where it is used for Process Heat like as HTST-Pasteurising milk, CIP Systems and Tanker Washing.

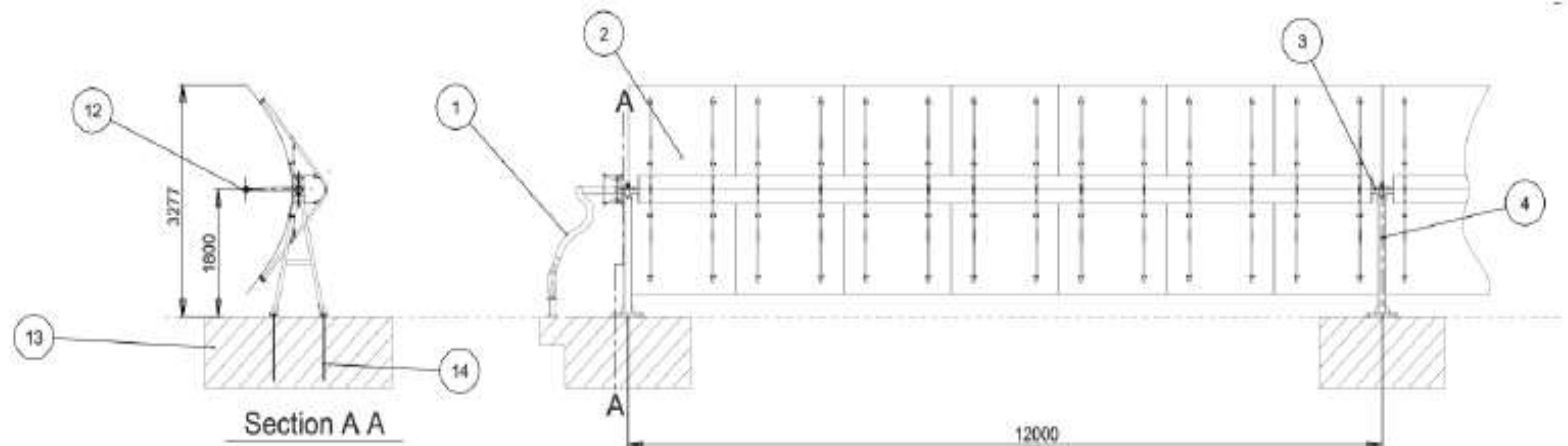


Industrial Design

Solar Module CF 100



- Special solar module, designed for industrial process heat- and steam
- Robust design for desert environments
- Developed in cooperation with the German Aerospace Centre DLR and industrial partners
- Modular concept with industrially produced components
- Optimised solar tracking system
- Length 12m, height 3.6m, weight 1.6t
- Torsion box design; easy to assemble

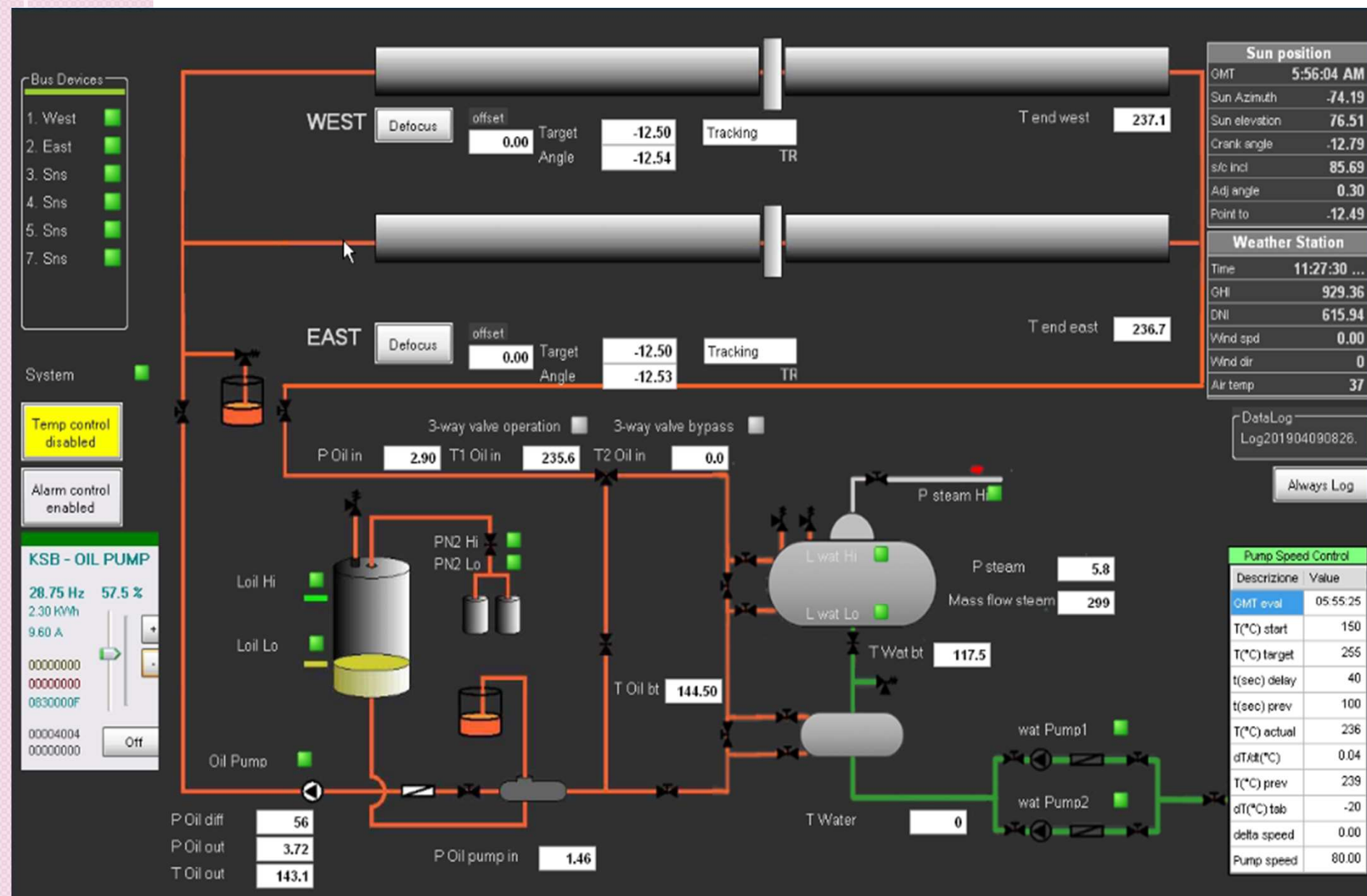


STEAM ACCUMULATOR

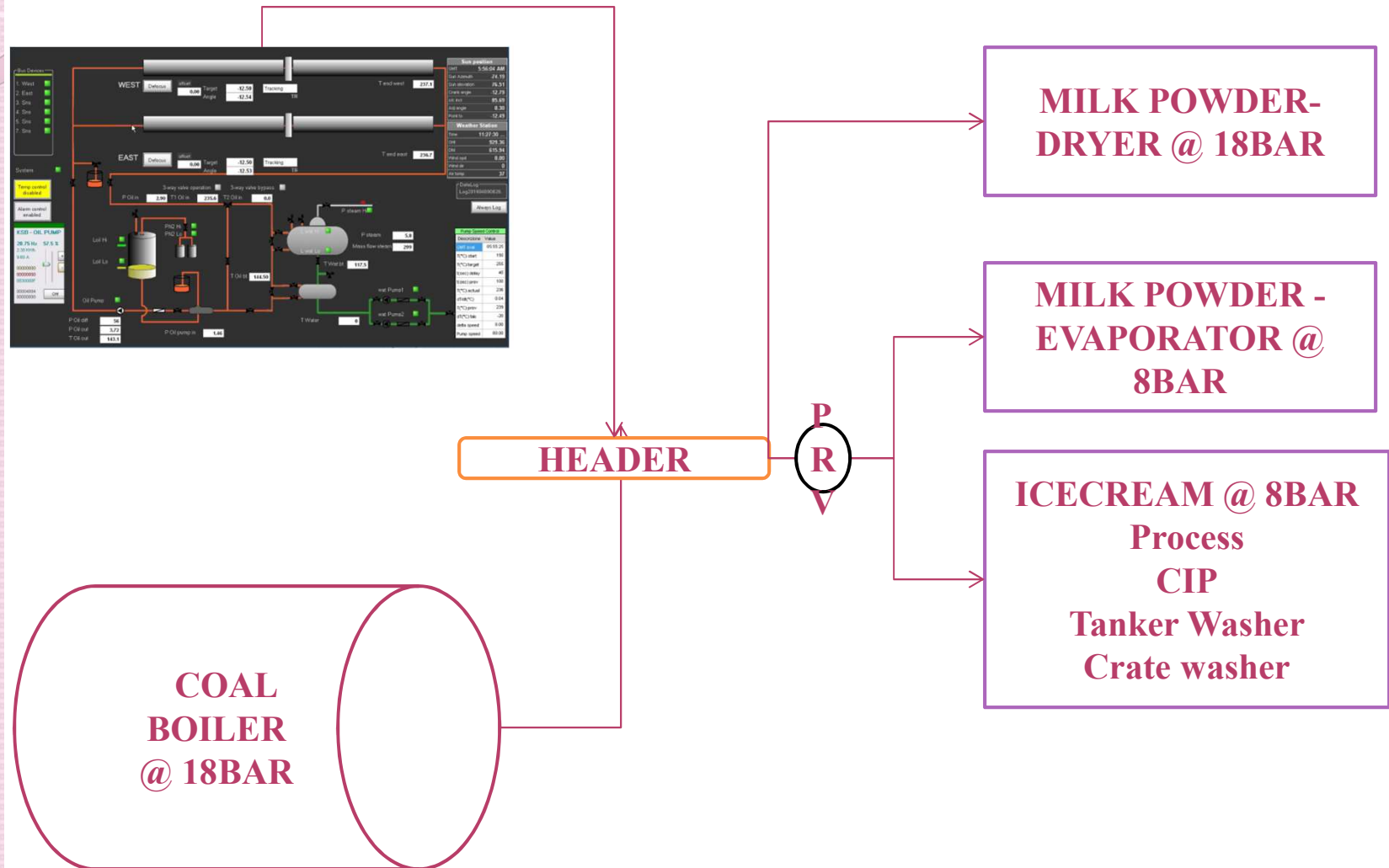
- Protarget designed the solar system with a steam accumulator, so that it could meet demand even if solar energy output was fluctuating.



SOLAR PARABOLIC TROUGH SYSTEM – WORKING LAYOUT



SOLAR PARABOLIC TROUGH SYSTEM – PROCESS WORKING LAYOUT



PERFORMANCE ANALYSIS SOLAR PARABOLIC TROUGH STEAM GENERATION SYSTEM

S.No	DESCRIPTION	Units	Values
1	INPUT ENERGY		
2	No of Rows Trough installed	Nos	2
3	Solar Parabolic Trough Collector Area	m ²	550
4	Daily Solar Irradiation	kWh/m ² day	5
5	Energy Available at Collector Area	kWh/day	2750
6	OUTPUT ENERGY		
7	Average Steam Generation rate in kg/hr	kg/h	375
8	Daily Steam Generation @ 7 Hours	kg/day	2625
9	Energy Generated through Solar Collector	kWh/day	1831
10	PERFORMANCE ANALYSIS		
11	SOLAR SYSTEM EFFICIENCY	%	67%



Hatsun's journey towards Greener Energy

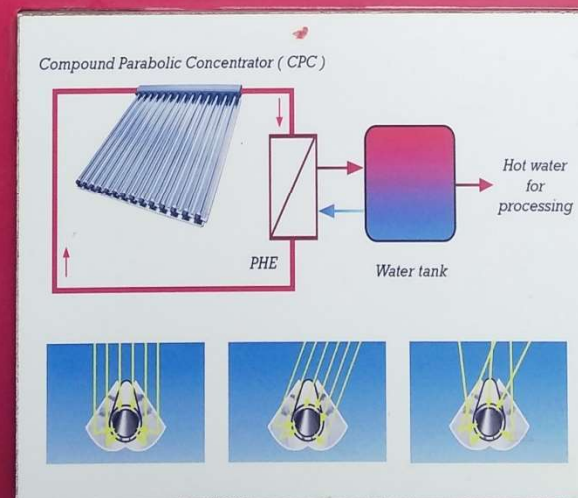
COMPOUND PARABOLIC CONCENTRATORS

Impact of 720 sq m of these

= 212 tons / annum of Coal usage reduction

= 7668 tons / 15 years of CO₂ emission reduction

SCHEMATIC REPRESENTATION OF CPC



Project design & implementation

SUN BEST

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Supported by
MNRE & UNDP



THANK YOU