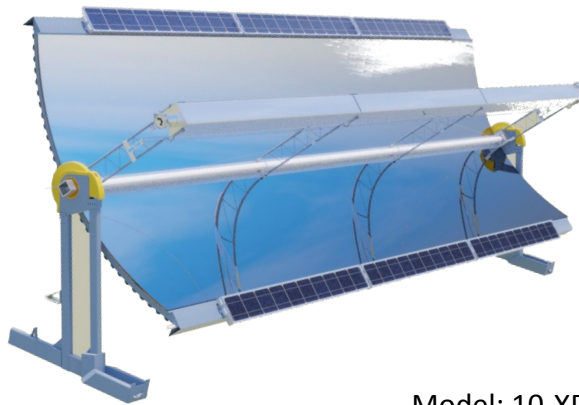


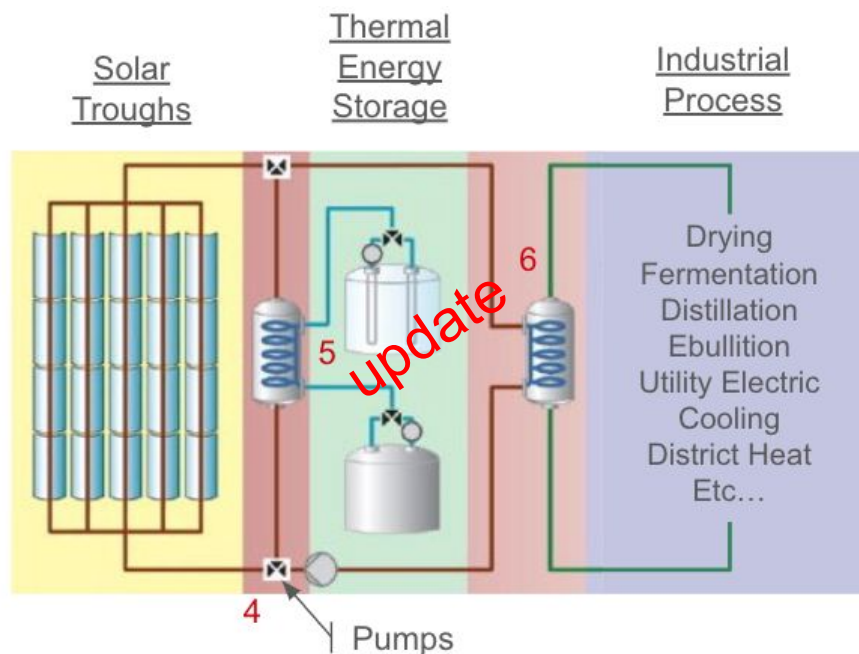
FLS has developed proprietary technology for solar troughs employed in Concentrated Solar Thermal (CST) plants to competitively generate industrial-scale heat.

## FLS Solar Trough



Model: 10-XP-CST

## CST System Schema



# FLS Energy Study of Lousado Tire Manufacturing Plant

## SHIP Study | Lousado, Portugal



### Study Conditions [DNI: TBD kW/m<sup>2</sup>/y]

|                 |             |                      |
|-----------------|-------------|----------------------|
| Installation    | Ground      |                      |
| Area            | TBD hectare |                      |
| Trough Spacing  | 200%        | 3.6m between troughs |
| Number of units | TBD         | 1.8m x 6m footprint  |

### Output/Input Temperatures

|                                                   |              |                            |
|---------------------------------------------------|--------------|----------------------------|
| $T_{\text{steam-loop}} / T_{\text{inlet, steam}}$ | 280°C / 90°C | Summer (Apr. 1 - Sept. 30) |
| $T_{\text{hvac-loop}} / T_{\text{inlet, hvac}}$   | 120°C / 80°C | Winter (Oct. 1 to Mar. 31) |

### Benefits

|                                  |                            |                    |
|----------------------------------|----------------------------|--------------------|
| Rated Power                      | <b>TBD kW<sub>th</sub></b> | Average summer day |
| Avg 24h Power [summer]           | TBD kW <sub>th</sub>       | June 21            |
| Heat (steam) Production [summer] | TBD MWh <sub>th</sub>      | Up to TBD kW       |
| Lifetime GHG Displaced           | 11,416 tonnes              | CO <sub>2</sub>    |

### Other

|                              |         |                                  |
|------------------------------|---------|----------------------------------|
| Thermal Energy Storage (TES) | TBD GWh | For buffering & improves utility |
|------------------------------|---------|----------------------------------|

#### Study Assumptions:

- Excess electricity generated by the hybrid system is supplied free to the plant
- In summer period, heat balanced to produce steam first (up to 735 kW), HVAC second (up to 600 kW)
- In winter period, heat goes only to HVAC system, with little production expected in December & January
- 2.5% increase in carbon credit per year
- Installation costs based on a socially burdened labor rate of 75 CHF/h (without profit)

# FLS Energy Study of Lousado Tire Manufacturing Plant

## SHIP Study | Lousado, Portugal

Financial metrics with carbon credits but without federal contribution below:

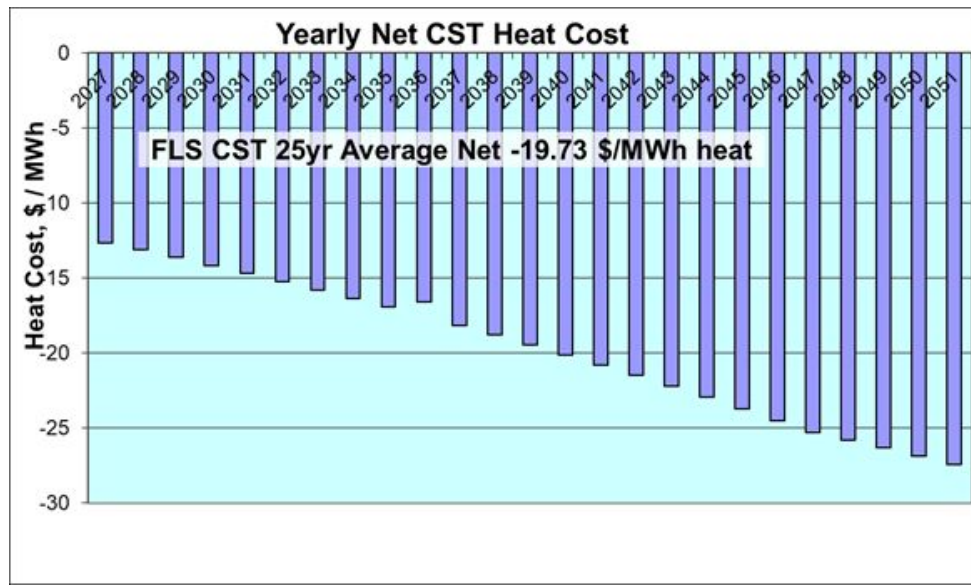


Figure 1: Annual LCoH in USD w/ Carbon Credits w/o Contribution



Figure 2: Payback Scenario w Carbon Credits w/o Contribution

# FLS Energy Study of Lousado Tire Manufacturing Plant

## SHIP Study | Lousado, Portugal

Financial metrics without carbon credits or federal contribution below:

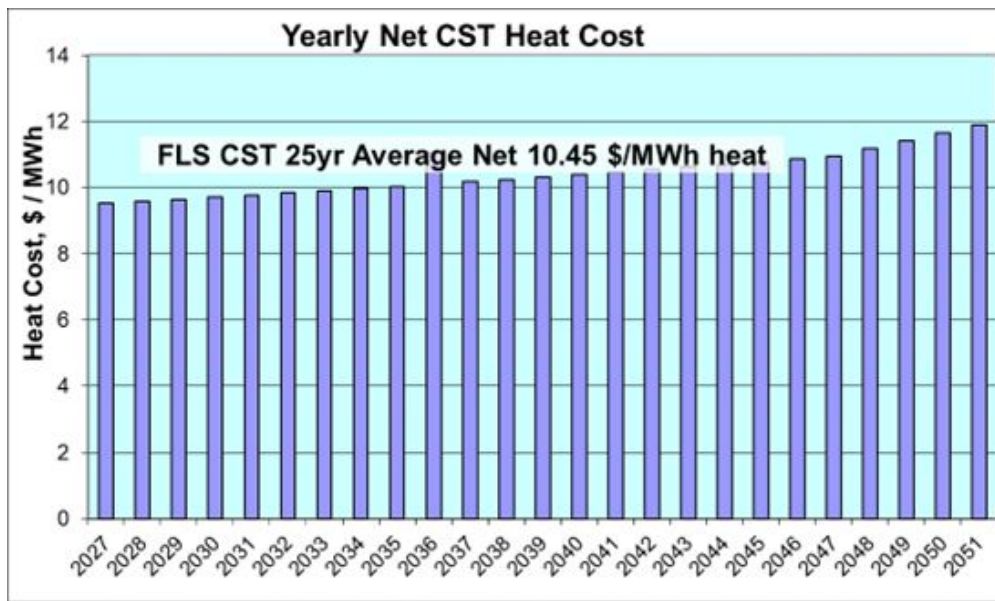


Figure 3: Annual LCoH in USD w/o Carbon Credits w/o Contribution



Figure 4: Payback Scenario w Carbon Credits w/o Contribution

# FLS Energy Study of Lousado Tire Manufacturing Plant

## SHIP Study | Lousado, Portugal

Unit production at various times during the year below:

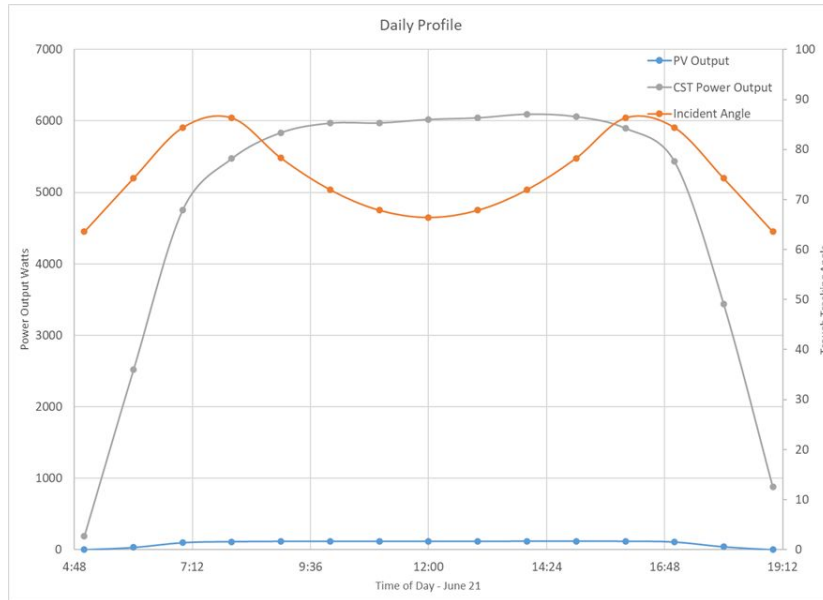


Figure 5: Average Per Unit Output Summer Solstice

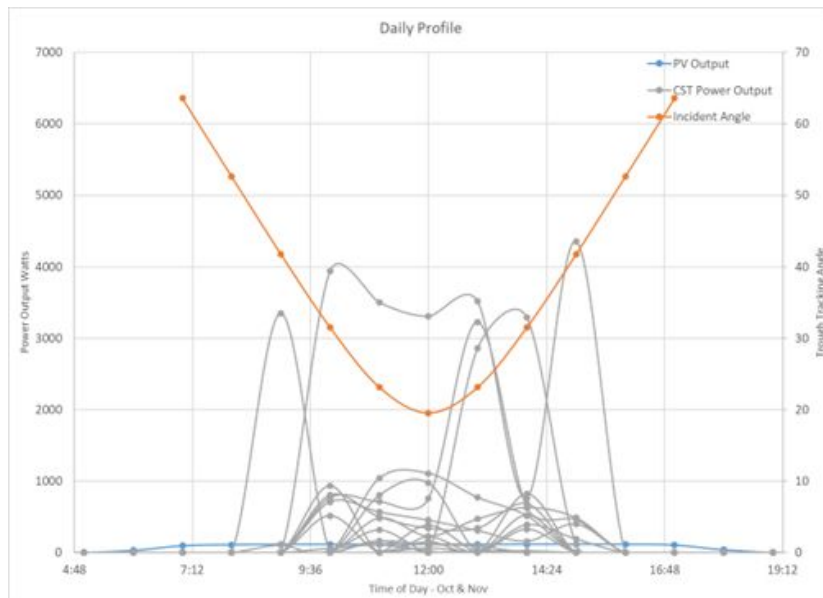


Figure 6: Typical per Unit Outputs September through December