

### Anticipated Heat delivery from various type of CST based systems in different regions of the country

| Sr. No | Region  | Indicative average DNI/ sq. m. / day* (In kWh) | Sunshine days | Fixed focus elliptical dish^ / PTC/ LFR with non evacuated heat receiver |   | Two axis tracked dishes with moving focus |   |
|--------|---|--|---------------|--|---|---|---|
|        |   |  |               | Efficiency at 150C**   | Heat delivery***/ sq. m. of aperture area / year (in lakhs of Kcal) | Efficiency at 150C**                      | Heat delivery***/ sq. m. of aperture area / year (in lakhs of Kcal) |
| 1.     | Leh Ladakh                                    | 6.5  | 320           | 40%  | 7.16  | 60%                                       | 10.73   |
| 2.     | Gujarat Rajasthan & western M.P.              | 6.0  | 300           | 45%  | 6.97  | 65%                                       | 10.07   |
| 3.     | North- West including Himalayas               | 4.5  | 250           | 40%  | 3.87  | 60%                                       | 5.81  |
| 4.     | North – East & eastern part of Orissa & A. P. | 4.0  | 250           | 40%  | 3.44  | 60%                                       | 5.17  |
| 6.     | Southern & Central                            | 5.0  | 280           | 45%  | 5.42  | 65%                                       | 7.83  |

^ Aperture area for various CSTs will be considered as per below:

- Fixed focus elliptical dish :  $3.14 \times \text{Major axis} \times \text{minor axis} / 4$
- Parabolic trough concentrator/ LFR :  $\text{Length} \times \text{Breadth}$
- Paraboloid dish (Circular) :  $3.14 \times (\text{Radius})^2$
- Paraboloid dish (Rectangular) :  $\text{Length} \times \text{Breadth}$

\* Can vary by +/- 10% at a particular location in the region

\*\* It is average annualized efficiency and is linked with ambient temperature and wind conditions of particular region. It reduces in the regions having lower ambient temperature and high wind velocity. It also reduces marginally for CSTs working at higher temperatures due to higher heat losses, thereby reducing the heat delivery

\*\*\* Heat delivery will

- i) increase if the fluid temperature goes down due to less heat losses. Likewise it will also decrease if working temperature is raised high say upto 350C or so especially in case of Paraboloid dishes which are designed for such temperatures.
- ii) decrease by 10% or more if the mirrors are not of solar grade quality.

**Note : Based on above heat delivery, payback period at utility place will be calculated by manufacturers and indicated in their proposals which will vary depending on fuel used and boiler efficiency. Non-Imaging concentrators may have an efficiency of 35- 40C with limitation of providing heat up to 120C**