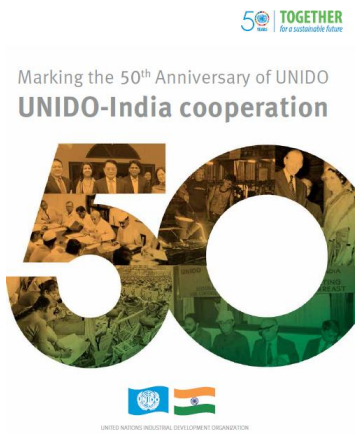
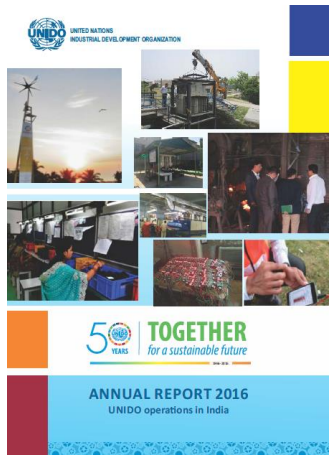
The development of solar energy will not just lead to our prosperity, but will also reduce the carbon footprint of the earth.

Hon'ble PM Sh. Narendra Modi, International Solar Alliance Conference, 11 March 2018

UNIDO in India

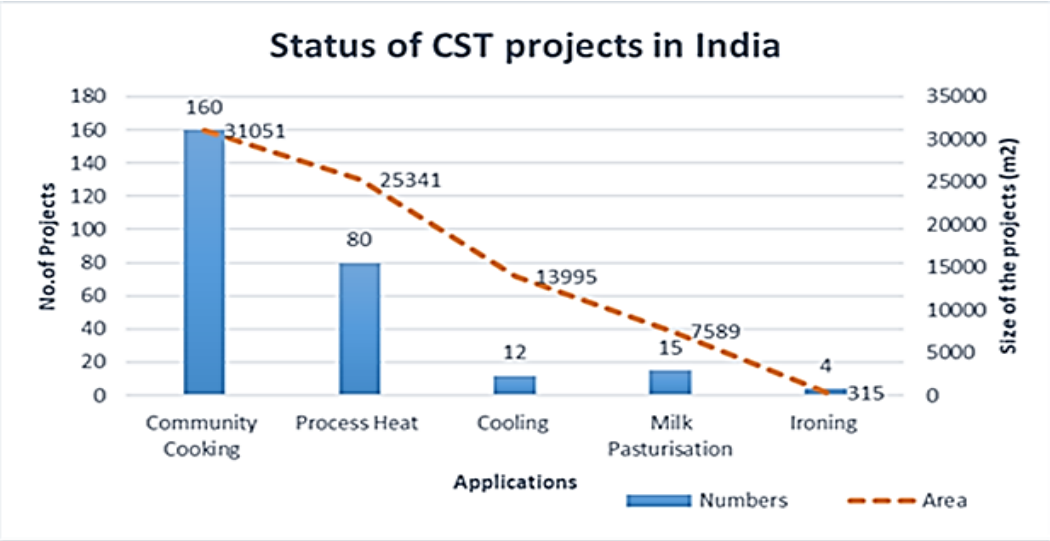


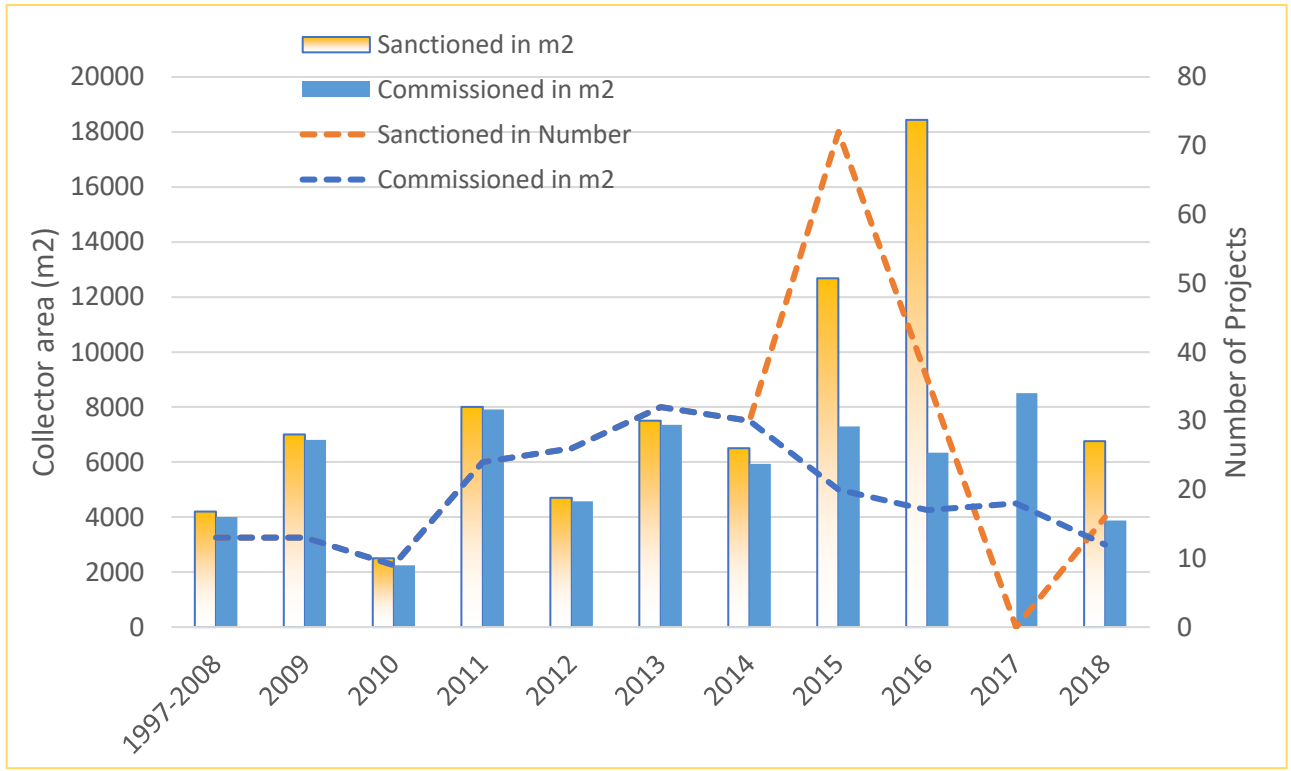


- **Technical cooperation services since 1966**
- **2013-2017 Country Programme**
  - Green industrial development
  - Inclusive economic development
  - South-South industrial cooperation
  - Operationalized 24 projects with total budget of USD 87 million
- **2018-2022 Country Programming Framework**
  - Productive and resilient MSMEs
  - Solutions for climate, resources and environment
  - Inclusive and responsible value chains and business
  - Strategic policy for industrial transformation

Status of CST projects Installed in India

Time Span	Total Collector area	Cumulative Collector area
Till March, 2015	38,835.40	-
2015-16	7,298.16	46,133.56
2016-17	6,340.36	52,473.92
2017-18	8,507.20	60,981.12
2018-19 (as on 26.07.18)	3,881.00	64,862.12





Mapping of Industrial Thermal Processes

Industrial Applications

- Drying, Washing, Pasteurizing, Boiling,Sterilizing,Cooling
- Bleaching, Dyeing , Drying, De-greasing, Washing
- Electroplating
- Process heat, Pre-heating water, Soaps, Synthetic
- Bleaching, De-linking, Paper drying, Pulp preparation
- Distillation, Separation, Extension, Drying, Blending

Types of Industry

- Food
- Dairy
- Beverage
- Textile
- Metal Surface Treatment
- Pharmaceutical
- Leather
- Chemical
- Paper & Pulp
- Plastic

Types of Applications

- Low Temperature Applications < 100°
- Low-Medium Temperature Applications 150°-350

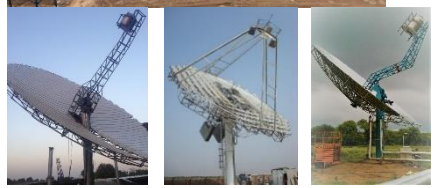
SYSTEM INTEGRATION


CPC

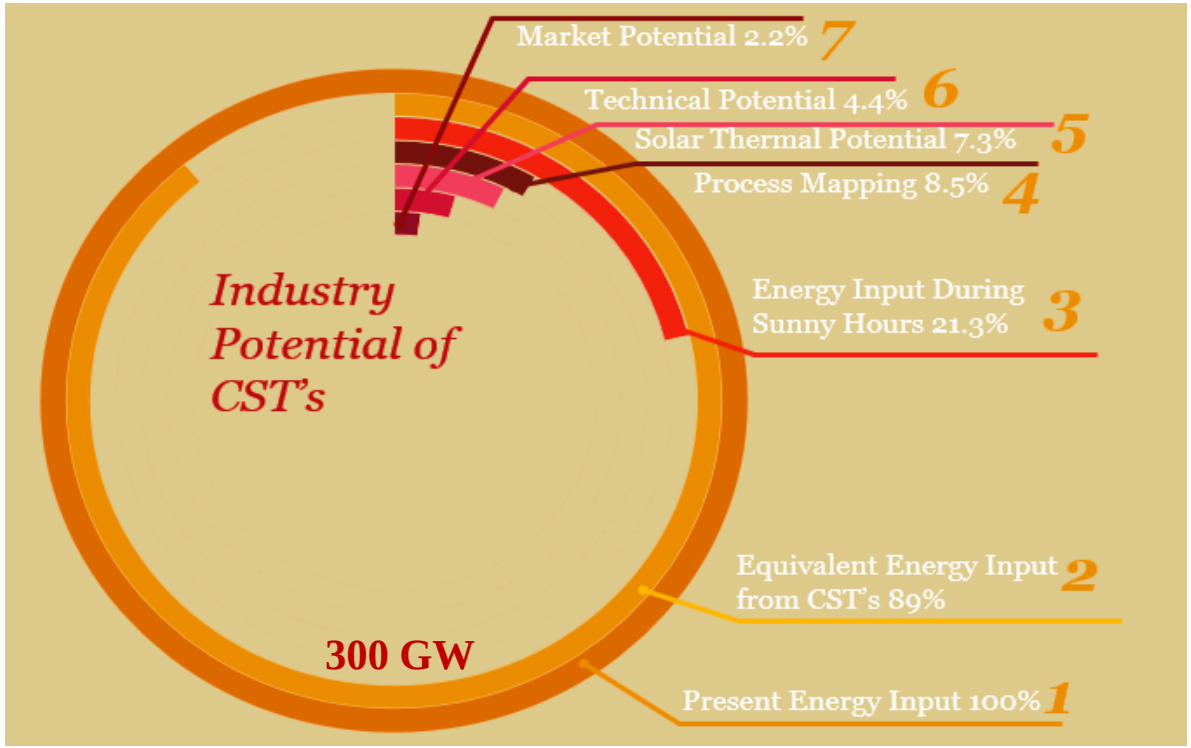

Scheffler Dish

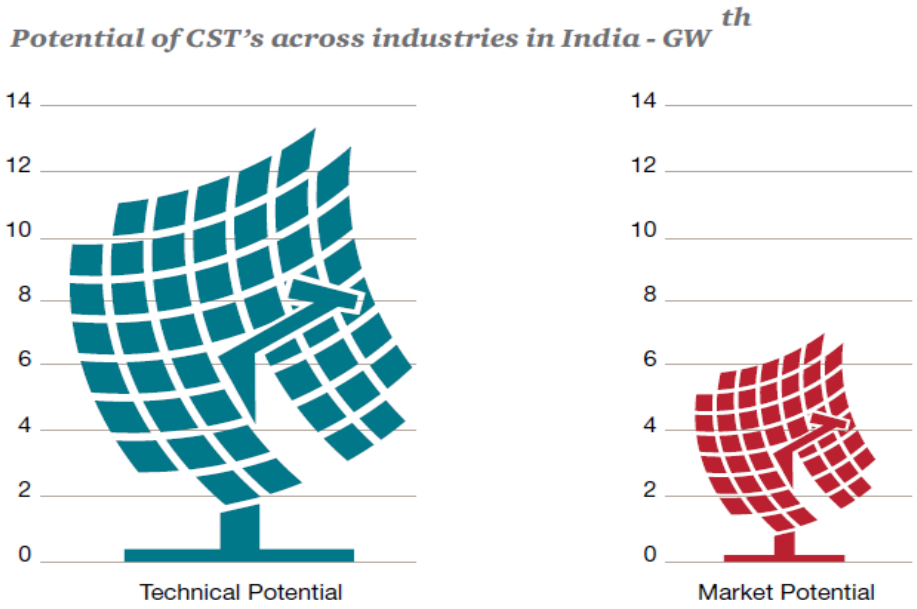

PTC


LFR


P. DISHES

Technical Potential for CST in India



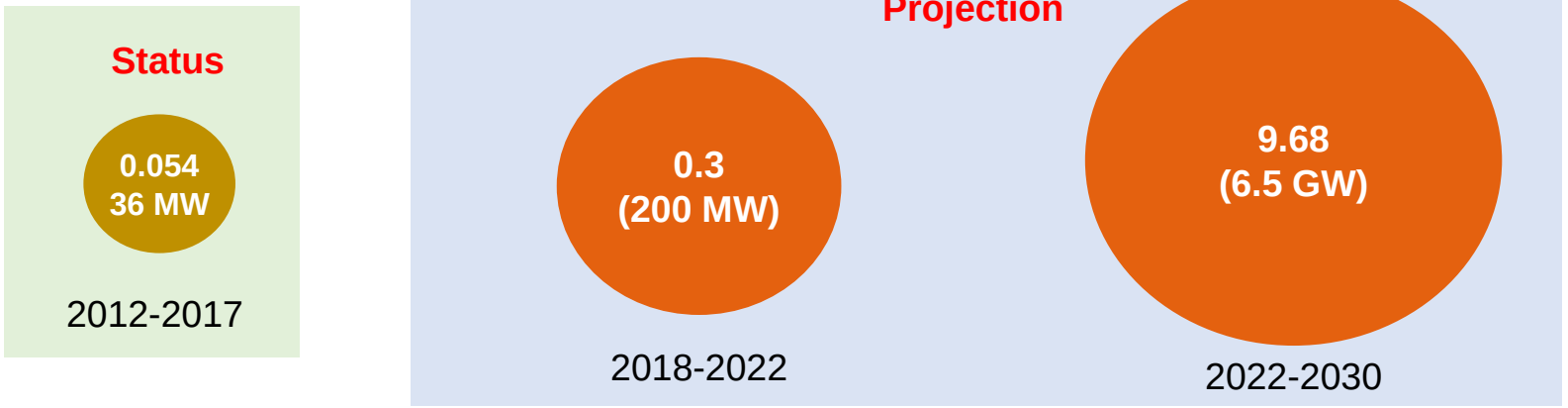


Technical potential for CST's in India are 13.18GW$_{th}$ and the market potential of 25 identified industries are 6.45 GW$_{th}$

Market Potential – Technical Potential*Market effective Multiplier

Sectors & Potential

Energy Generation from CST: Status and Potential (mil. m^2 Collector Area)



The 14 industrial sectors identified in the MNRE-GEF-UNIDO project → Food Processing, Paper & Pulp, Fertilizer, Electroplating, Pharmaceuticals, Textiles, Refineries, Desalination, Breweries & Rubber

Aim of the project → Complement MNRE's support programme by helping to remove barriers associated with Concentrating Solar Thermal (CST) technology, its awareness, capacity building, market and financial barriers

Outputs Envisaged from the Project

- Demo CST projects are installed with 45,000 m^2 of collector area (eqv. to 39,200 tonnes of CO_2 emission)
- Barriers removed for large scale deployment of CST Technologies. Knowledge documents & standardization of performance measurement

Financial Support for CST

- MNRE support for the CST projects @ 30% of the benchmark cost for profit making bodies and 60% support in hilly area for non-profit making bodies.
- Accelerated depreciation for profit making companies (40% of the balance project cost every year)
- Loan support for the CST project at an interest subvention of 5% from the current rates using funds under MNRE-IREDA-UNIDO scheme.

CFA from MNRE for CST projects ended on 31 March 2020. It may be brought back by the Ministry in some form based on the on-going evaluation of the CST scheme and performance of installed systems.

Innovations through the UNIDO Project

- ✓ UNIDO launched the first ever soft loan scheme for CST to Promotes large-scale projects for process thermal applications in the industrial sectors
- ✓ The project has promoted new CST technologies and applications
  - A CST project promoted by UNIDO in RESCO mode (being installed in Thane, cooling and other thermal applications in the Municipal Corporation Hospital)
  - A highly efficient and low weight Crossed Compound Parabolic Concentrator (xCPC) to generate steam for various applications is being considered for support by UNIDO.
  - Technical support to CEMCOT for the waste water treatment using in common effluent treatment plant (CETP) at Ranipet.
  - Promotion of **highly efficient large paraboloid dishes** and **new innovative applications**, e.g. solar based liquid effluent treatment and heat supply in industry clusters.
- ✓ UNIDO has partnered with National Institute of Solar Energy to develop and implement a CST skill development program for training for trainers and training for technician.
- ✓ Promotion of System Integrators for better system design and optimization

Contd…

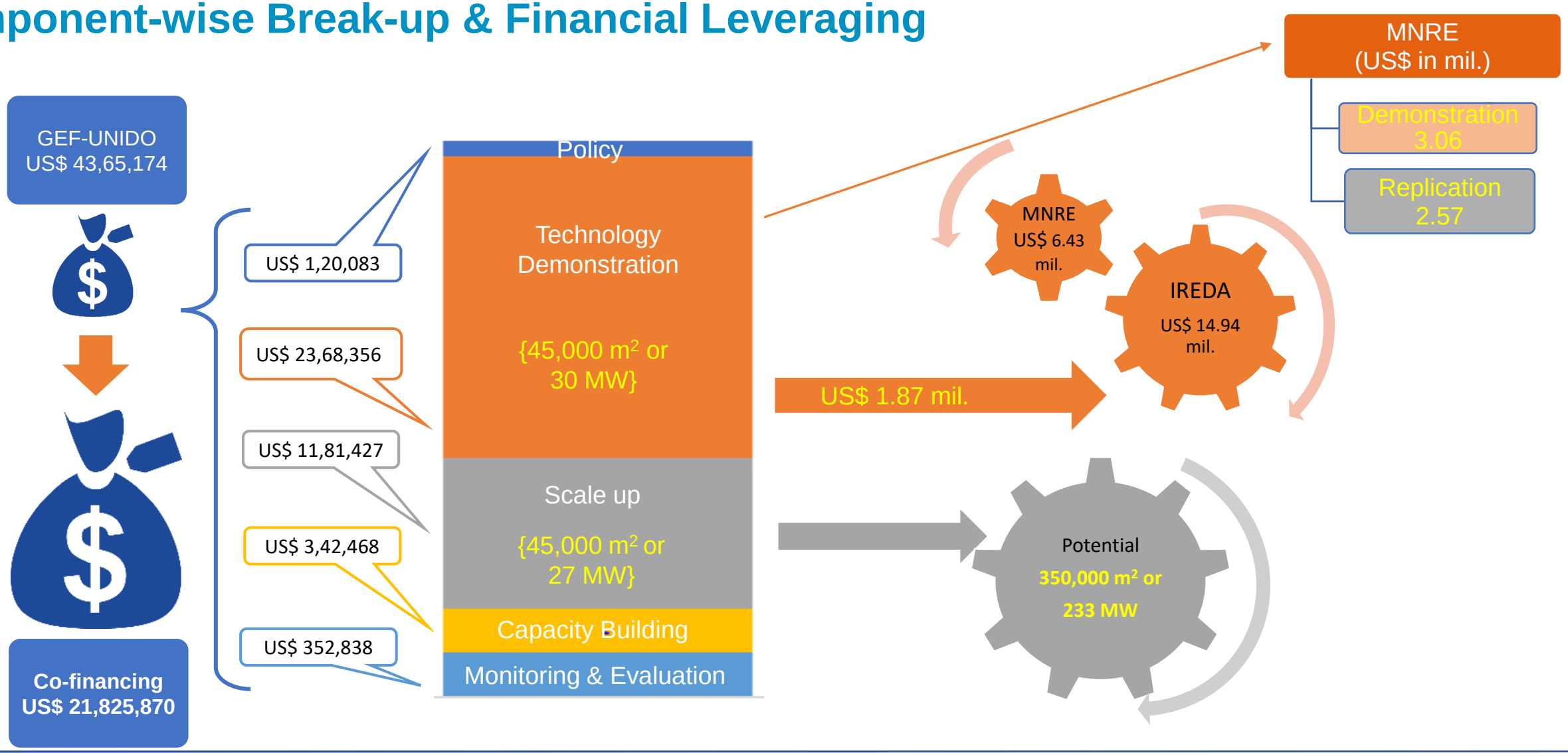
- ✓ R&D work on thermal storage solutions for CST systems.
- ✓ Use of CST for Liquid Effluent Treatment in industries
- ✓ UNIDO is promoting large CST projects such as:

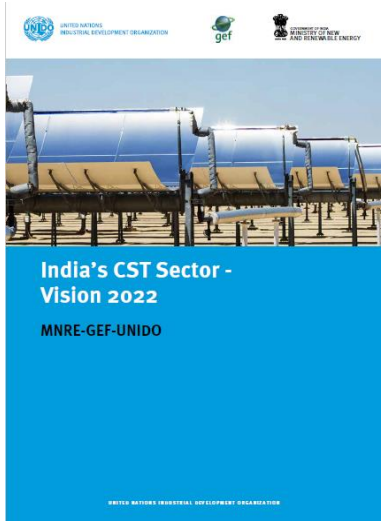
– Feasibility report and Tender document for ONGC for the CST installation at Mehsana, Gujarat (system with 9,800 m^2 collector area uses a thermocline storage for the first time in India, and it is to be integrated with a heat recovery system).
(Replication potential: 2,00,000 m^2 of collector area in 20 more oil well plants of ONGC)

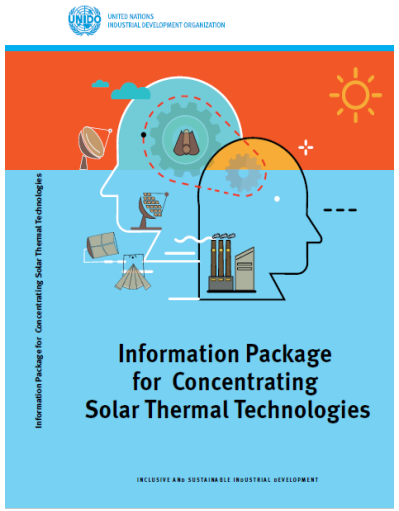
– Feasibility report to GNFC, Bharuch, Gujarat for 70,000 m^2 CST system. GNFC is preparing the detailed project report for tendering.

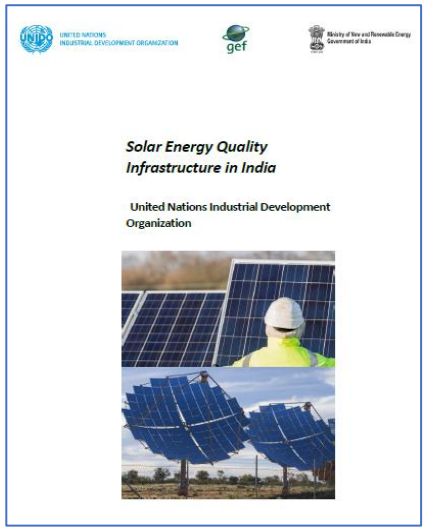
- ✓ Support for manufacturing in the CST sector.
- ✓ UNIDO prepared detailed report for refurbishment of 1 MW CST plant at NISE in March 2019 on request from NISE.

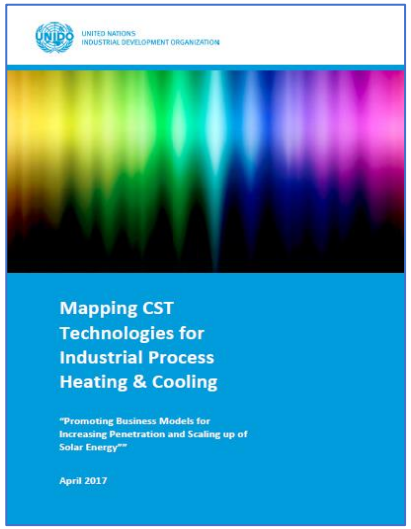
Component-wise Break-up & Financial Leveraging

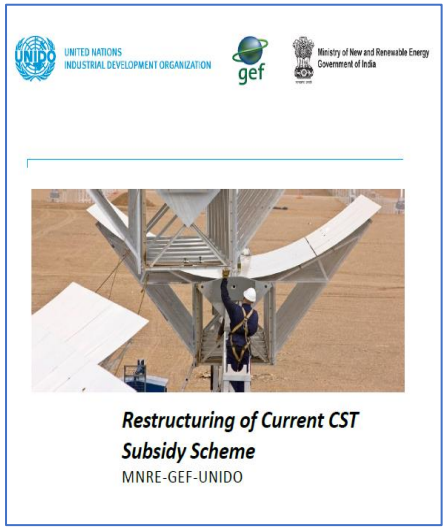



India's CST Sector -
Vision 2022
MNRE-GEF-UNIDO


Information Package for Concentrating Solar Thermal Technologies
Information Package for Concentrating Solar Thermal Technologies


Solar Energy Quality
Infrastructure in India
United Nations Industrial Development Organization


Mapping CST
Technologies for
Industrial Process
Heating & Cooling
"Promoting Business Models for Increasing Penetration and Scaling up of Solar Energy""
April 2017


Restructuring of Current CST
Subsidy Scheme
MNRE-GEF-UNIDO


UNIDO Templates
for DPR
"Promoting Business Models for Increasing Penetration and Scaling Up of Solar Energy"
April 2017

Challenges

1. Clear policy for the promotion of CST sector
2. The CST market in India is currently small to sustain growth on its own
3. Limited, practically zero track record of performance of existing solar thermal installations and hence revenue flow
4. Low awareness about the benefits of CST
5. Absence of skill development programme and technical/ financial competition
6. No best practice guidelines / standards / testing facilities
7. Labs are working on materials but consolidated efforts on technology demonstration are required

Outlook:

(1) The CST sector in the country appears to be at the tipping point and ready to be scaled up;

(2) The investment decisions for solar thermal deployment by industries are expected to slow down due to reduce the International crude oil price & COVID-19 lock down giving rise to certain degree of uncertainty; and

(3) UNIDO's project is making effort to bring confidence in industries.

Thank you ……

COVID-Corona Virus Disease