UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

SUSTAINABLE DEVELOPMENT GOALS

Project Implementation Report

(1 July 2022 – 30 June 2023)

Project Title:	**Promoting business models for increasing penetration and scaling up of solar energy**
GEF ID:	4788
UNIDO ID:	130149
GEF Replenishment Cycle:	GEF-5
Country(ies):	India
Region:	SA-Southeast Asia
GEF Focal Area:	Climate Change Mitigation (CCM)
Integrated Approach Pilot (IAP) Programs[1]:	N/A
Stand-alone / Child Project:	Stand-alone
Implementing Department/Division:	GLO/RFC/ASP/IND
Co-Implementing Agency:	N/A
Executing Agency(ies):	Ministry of New and Renewable Energy (MNRE) [2015-21] Ministry of Micro, Small and Medium Enterprises (Mo MSME) [2022-23]
Other Project Partners:	Department for Promotion of Industry and Internal Trade (DPIIT); Ministry of Environment, Forests and Climate Change (MoEFCC); Ministry of New and Renewable Energy (MNRE);
Project Type:	FSP
Project Duration (months):	60 months (at project start)
Extension(s):	2
GEF Project Financing:	USD 4,365,174
Agency Fee:	USD 436,517
Co-financing Amount:	USD 21,825,870
Date of CEO Endorsement/Approval:	23 December 2013
UNIDO Approval Date:	4 July 2013
Actual Implementation Start:	23 January 2014
Cumulative disbursement as of 30 June 2023:	USD 1,960,288.17
(Expected) Mid-term Review Date (MTR):	Completed October 2017
Original Project Completion Date:	31 January 2019

[1] Only for **GEF-6 projects**, if applicable

Project Completion Date as Reported in FY22:	31 December 2023
Current SAP completion date:	31 December 2023
Expected completion date:	30 July 2025
Terminal Evaluation Date (TE):	Already completed, published May 2022. TE Update foreseen during Q1, 2025
Expected Financial Closure Date:	31 December 2025
UNIDO Project Manager[2]:	René van Berkel

I. Brief description of project and status overview

Project brief and objective

This project "Promoting business models for increasing penetration and scaling up of solar energy" in India is aimed at promoting, demonstrating and scaling-up the application of concentrated solar thermal (CST) technologies for process heating (and possibly cooling) in the manufacturing sector in India. CST captures solar radiation and turns this into heat (hot water or air, steam, or any other heat transfer medium) which can then be used for heating or cooling of manufacturing, industrial, utility and other processes and systems.

Until 2021, with Ministry of New and Renewable Energy (MNRE) as executing agency, the Project has made valuable achievements particularly through the development and publication of knowledge products, including CST mapping against industrial processes, CST policy roadmap and CST technology packages, policy reviews covering relevant boiler regulations, building codes and domestic manufacturing awareness raising and other enabling activities (all knowledge products accessible through: https://isid4india.org/solar-energy.php). Moreover, the Project had contributed to the development and implementation of three demonstration projects, covering CST applications in silk reeling, pharmaceuticals manufacturing and leather effluent treatment.

From 2022, Ministry of Micro, Small and Medium Enterprises (MoMSME) became the national execution agency for the focus on demonstration and deployment of CST installations in MSME manufacturing units in six light industrial clusters, respectively: Ankleshwar (chemicals manufacturing in Gujarat); Jorhat (tea processing in Assam); Medak and Goa (pharmaceuticals manufacturing in Telangana and Goa); Surat (textile processing in Gujarat); and Vellore (rice milling in Tamil Nadu). MSMEs in these clusters require low to medium temperature heat, which potentially can be met through solar process heating using CST technologies. Among the five target states, Goa, Gujarat, Telangana and Tamil Nadu have favorably high direct normal irradiation (DNI) and high number of sunny days, whereas Assam has lower DNI but relatively high combined direct and diffuse solar irradiation that can be captured with non-imaging concentrator type Compound Parabolic Collectors.

UNIDO and MoMSME have been working with these target clusters since 2017 for the demonstration and scaling up of the application of and investments in replicable energy efficient technologies (see: https://www.isid4india.org/promoting-market.php). During the reporting period, the Project advanced to get industry interest and develop 13 Detailed Project Reports (feasibility studies) which have been endorsed for technical and financial support under the Project. The Project will continue to mobilize MSME units for CST implementation, and support these with technical advice, development of bankable DPRs and financial and technical support for implementation in selected demonstration and replication units.

Project Core Indicators		Expected at Endorsement/Approval stage
1	Greenhouse Gas Emissions Mitigated (metric tons of CO2e)	83,000 (direct) + 166,000 (indirect) over 20-year period.
2	Energy (heat) generation (MWhth/day)	187
3	CST installations	• 25 projects with 20,000 m^2 collector area

[2] Person responsible for report content

		(demonstration), • 50 projects with 40,000 m^2 collector area (scaling up), This is expected to include direct technical and part financial support for 6,800 m^2 collector area for demonstration and 19,200 m^2 collector area for replication under UNIDO-GEF-MSME project.

Baseline
Industry globally accounts for 32% of final energy use and 74% thereof is used for process heating and cooling, with estimated 52% of this heat required at low to medium temperatures not exceeding around 400°C – which is within achievable range for direct solar heating particularly through the use of Concentrating Solar Thermal (CST) technologies. In India, industry's share in final energy use is even higher, currently at 56%. The project in its CST Policy Roadmap 2022 estimated the market potential for CST deployment for process heating and cooling in India at 6.45 $GW_{th.}$ This compares to applications of CST in 2018 of approximately 50 MW_{th} or less than 1% of this market potential. The heating and cooling demands can be successfully met through CST technologies, in particular in a dozen predominantly light sectors, such as food processing, textile processing, metal products, chemicals and pharmaceuticals manufacturing. This CST Road map was aimed at guiding stakeholders and project developers to consider and invest in large scale deployment of CST technologies in India. The project aims to promote implementation and investments in CST applications in industry through technology demonstration and investment, scaling up, capacity building and knowledge management.

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e., FY23. Please also provide a short justification for the selected ratings for FY23.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management[3], Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY22, in the last column.

Overall Ratings[4]	**FY22**	**FY23**
Global Environmental Objectives **(GEOs)** / Development Objectives **(DOs)** Rating	*MS*	*MS*
The Project over the reporting period has readied ten MSME units to install suitable CST systems with technical and financial support of the Projects. The system sizes are though small relative to stated GEOs. Only through large scale replication beyond project closure full scale GEOs may be realized.		

[3] Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently

[4] Please refer to the explanatory note at the end of the document and assure that the indicated ratings correspond to the narrative of the report

Implementation Progress **(IP)** Rating	*MS*	*MS*
The change to MoMSME as national execution agency has benefitted implementation progress due to greater focus and more realistic CST installation sizes. Progress has also been made in involving national and international technology suppliers and knowledge partners.		
Overall **Risk** Rating	*M*	*M*
The earlier significant risk of declining government support has been effectively mitigated with the change of national execution agency and the synergistic alignment with the ongoing GEF energy efficiency project with the same national execution agency. The remaining project risks are predominantly technology performance risks, which are being addressed by engaging leading national and international CST technology and application experts and suppliers, and project timing, given the highly condensed planning for completion of the restarted project with the new execution agency.		

II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
Component 1 – Strengthening of policy and Institutional framework				
Outcome 1: Favourable policy and regulatory environment created for solar energy applications in industry				
Output 1.1: Set of recommendations and guidelines for policy makers developed	Solar heating and cooling policy and roadmap	No specific policy for CST for industrial purposes	Clear solar heating and cooling policy and roadmap published	Completed and reported in PIR 2021, no further specific activity required.
	State specific policy to incentivize CST manufacturing	No incentives for CST manufacturers	Clear manufacturing policy for CST	Completed and reported in PIR 2021, no further specific activity required.
	Due diligence guidelines for project approval	No due diligence guidelines for MNRE project approval Limited number of projects approved and no clear criteria for approval	Due diligence guidelines published	Completed and reported in PIR 2021, no further specific activity required.
	Proposal to modify boiler regulations and acts to consider the use of CST	No regulations to consider CST integration in steam and boiler systems	Clear modifications to boiler regulations incorporating CST	Completed and reported in PIR 2021, no further specific activity required.
	Proposal to modify building regulations to consider the use of CST	No regulations to consider CST integration in industrial and commercial buildings	Proposal for consideration of CST for new industrial buildings	Completed and reported in PIR2021, no further specific activity required.
Note : The reports developed under the Component 1 are accessible from https://isid4india.org/solar-energy.php				
Component 2 – Technology and Demonstration				
Outcome 2: • Technical and financial viability of projects confirmed • Local manufacturing capability for solar energy systems in industrial applications enhanced • Investment in solar energy applciations in in industtry increased				

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
Output 2.1: Detailed technology application tools developed: integrated CST with storage; detailed project reports (DPR); CST demonstration projects selected; qualified consultants selected; 25 demonstation projects installed; performance monitoring and analysis of projects; and case studies prepared	Number of industry specific reporting parameters for CST systems	No performance standards for CST	Standards developed for all 5 CST technologies from all channel partners	Reported in PIR2021 that CST technology guidelines, including design and application opportunities and technical performance prepared and published for 6 different types of CST technologies. Report finalized, published and promoted for application (*) No further specific activity required.
	Number of performance benchmarks	No benchmarks	Benchmarks developed for 10 zones	Focused on five most promising DNI zones viz. Jaipur, Bhopal, Pune, Madurai and Kolkata for which specific performance benchmarks have been developed and submitted to MNRE in November 2019 and have since been promoted for adoption and implementation ([5]). No further specific activity planned.
	Number of standardised financial models for CST	No standard model	Standard financial model developed	Suggestions for re-structuring of CST subsidy scheme submitted to MNRE for changing of incentive schemes based on thermal performance instead of collector area. However, MNRE discontinued incentive scheme for CST, leaving the recommendations unutilized. No further specific activity planned
	Number of CST packages developed	No of CST packages and guidelines	10 CST packages and guidelines	CST information packages (manuals) developed for six key CST technologies. Guidelines completed and published (*). No further specific activity planned.
	Number of process information booklets	No of process information booklets	11 process information booklets	Completed and published (*). No further specific activity planned.
	Number of CST projects implemented with support from GEF	91 systems installed	25 additional projects implemented with direct support from GEF	• Total 13 Detailed Project Reports (DPRs) for the MSME industries prepared during the PIR period, and 10 DPRs reviewed by the UNIDO project team and further proposed in TWG meetings which was held on 2nd February 2023 and 12th May 2023, The TWG members approved 10 DPRs and recommended in PSC meeting for approval. • The 3 more DPRs were reviewed by the UNIDO project team, and it is under process for finalisation of DPRs.
	Installed capacitiy of new CST projects (kW and collector area)	0 installed	Installed capacity of more than 12.5 MW and 20,000m^2	
	Performance monitoring, evaluation reports and case studies on each GEF supported project	No dissemination material on CST	25 case studies	
Output 2.2: Investment in solar energy applications in industry increases	Number of pilot systems of solar technologies installed Investment mobilized (USD)	Limited pilots and investment on solar themal applications in industry	Up to 25 pilot systems	• Case studies prepared for two completed CST demonstration projects in 2021 and reported in last PIR meeting, both the case studies available on project website. •
Component 3 – Scale up				
Outcome 3: • Investment in solar energy applications in industry multiplied • Quality of solar energy components assured				
Output 3.1: Business models for CST leading to sustained	Business models in place Number of MNRE standards developed	No business business models 5 standards developed	Up to 3 models developed Up to 8 standards developed	RESCO financing model developed and operationalized for one CST pilot project (which had to be abandoned due to COVID restrictions at the respective hospital site).

[5] Published on project's website under isid4india.org, see: https://www.isid4india.org/pdf/Performance%20of%20CST%20technologies%20at%20five%20different%20latitudes%20in%20India.pdf

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
replication of solar thermal applications in industry Quality assurance and certification framework in place	Number of recommended certification schemes	None	Certification schemes recommended	Report on "Solar energy quality infrastructure in India" prepared and published ([6]), no further specific activities foreseen.
Output 3.3: Financing facility for scale up established	Financing facility established	No financing facility available for CST	50 projects with 25 MW_{th} installed and approximately 40,000m^2 124 MW_{th} energy daily from projects A financing facility established	Under umbrella of National Dairy Development Board (NBRD) encouraged the development of 26 CST projects in dairy sector of which 13 have been realised with cumulative collector area of 7,809 m^2 and capacity of 5.2MW_{th}. This figure was reported in the PIR2021. Now, the 13 DPRs prepared for the MSME industries and total 10 DPRs reviewed and recommended for implementation during the PIR period by the Project's TWG.
				The CST financing scheme developed by the project which had been tailored to MNRE's financial support, has been discontinued, due to discontinuation of MNRE schemes. No new specific efforts have been made on financing facility for scaling up in view of delayed progress on financial package for demonstration plants. For the remaining project period it is foreseen to provide direct financial support as capital subsidy for MSME units that invest in CST installations.
Component 4 – Awareness raising and capacity building				
Outcome 4: • Capacity of key players in target industries enhanced • Technology transfer and information sharing tools established				
Output 4.1: Trained manufacturers, suppliers and installers	No of installation, operation, maintenance and trouble-shooting manuals for CST	No manuals	11 manuals	• ToRs developed for hiring national & international agency. • All the ToRs reported in PSC meeting and awarded two contracts to the national agencies on 16th November and 22nd December 2022. • Draft ToR for the hiring of international agency was discussed in PSC meeting and suggested to revise the scope of work and focus more on capacity building, peer review of DPRs and preparation and delivery of training for trainers.
	No of training sessions targeted at manufacturers, suppliers, installers and academics on CST	0	6	
	No of trained manufacturers, suppliers and installers	0	120	
	No of trainig sessions for ITIs and maintenance staff	0	10	
	No of trained ITI students and maintenance staff	0	200	

[6] Published on project's website under isid4india.org, see: https://www.isid4india.org/pdf/Solar%20Energy%20Quality%20Infrastructure%20in%20India.pdf

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
Output 4.2: Awareness raised among the business community	No of workshops and field visits targeted at industry	None	20	• The project has conducted 21 workshops and 19 site visits in association with MNRE, during 2014-2020. The workshops were organised in 13 states viz Uttarakhand, Himachal Pradesh, Gujarat, Karnataka, Madhya Pradesh, Tamil Nadu, Maharashtra, West Bengal, Uttar Pradesh, Rajasthan, Telangana, Punjab and Pondicherry. • The report of 11 state level workshops is available online ([7]). • The project organised a workshop in association with MoMSME on 22nd March 2023 in Guwahati for the tea industries under the Jorhat Tea Cluster and contributed to industry workshop in Tamil Nadu on 31st May 2023.
	Number of organisations attending awareness raising sessions	None	1000	During the PIR period, total 35 participants attained in the workshop organised in Guwahati under the Jorhat tea cluster.
Ouput 4.3: Technical capacity built through promotion of industry-academic partnerships	No of field fisits for academics	None	20	Field visits for academics combined with other earlier PIRs (up to 2021).
	No of academic institutions attending field visits	0	200	
	No of guest lectures given on CST	0	20	During the PIR period, 4 guest lecture provided in academic and technical institutions.
	Knowledge platform establishment	No	Knowledge platform establsihed	Project website created with knowledge products, see: https://isid4india.org/solar-energy.php
	Number of users of knowledge platform	None	200	
	Number of joint industry-academic applied research projects initiated	None	5	One research project on solar thermal storage had been contracted to IIT Mumbai, however, not started by January 2021 and hence contract had to be cancelled in view of operational halt. No further specific activities foreseen.
Output: 4.4 CST and project information shared	CST webportal established	None	1	https://isid4india.org/solar-energy.php
	Number of users of website per year	0	1000	
Ouput 4.5: Documented project outputs, case studies, best practices and lessons learned	Number of newsletters produced	0	20	• 6 newsletters published and circulated until 2021 and reported in earlier PIRs. • One article published in 1st International Conference on Environment and Sustainability Summit Goa (IESSG) on 4 February 2023 at Dr. Shyama Prasad Mukherjee Stadium, Bambolim-Goa through GEDA.
	Number of recipients of newsletters	0	2000	
	Nuber of brochures developed	0	20	4 Sunfocus magazines published until 2021 and reported in earlier PIRs. One CST project brochure developed during the PIR period.
	Number of industrial clusters advertising CST	0	15	Four industry clusters had by end of reporting period agreed to partner with the implementation of CST projects.
	Number of adverts in national press	0	10	Two national press adverts published in February 2020.

[7] Published on project's website under isid4india.org, see: https://www.isid4india.org/pdf/Statelevel_CST%20Workshops%20Report.pdf

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
	National workshop	0	1	Completed in August 2019 and reported in respective PIR.
Component 5: Monitoring and evaluation				
Outcome 5: Project's progress towards goals confirmed and/or necessary adjustments made				
Output 5.1 Effective monitoring and evaluation	Mid Term Review	0	1	Completed in October 2017
	Terminal Evaluation	0	1	Completed in September 2021 which recommended an extension of project on no cost basis with a (re)focused project strategy and change to different Ministry as execution agency.

(*) The findings and recommendations under the outputs "performance benchmarks for CST technology" and "CST packages", have been merged into extended CST technology packages/guidelines, which have been finalized and published and are promoted for consideration and use by CST proponents, industry end users, policy makers and other stakeholders ([8]).

III. Project Risk Management

1. Please indicate the overall risk management: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

	(i) Risks at CEO state	Risk Level FY 22	Risk Level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk[9]
1	Lack of interest from Indian and foreign manufacturers of solar concentrator technologies.	L	L	- Throughout the project, there will be regular and continued contact with manufacturers which should lead to their interest and participation. - the project design also motivates and creates interest of manufacturers	The project organised meeting with various industrial associations in identified Micro, Small and Medium Enterprise (MSME) clusters i.e South Gujarat Textile Processor Association (SGTPA), North Eastern Tea Association, Surat (NETA),Golaghat, Bhartiya Chaya Parishad Guwahati, India Chamber of Commerce, Guwahati and outcome of the meeting to generate Expression of Interest for the promotion of CST project. These EOIs will help to create demand for CST manufacturing and installation.	☐
2	Lack of interest from existing and prospective users	L	L	-Most existing (pre-Project) users have received support from MNRE for project implementation. Hence, informal influence can be exercised - All existing (pre-Project) CST projects have only been possible with support from MNRE, and prospective users will be aware of their need to also secure support from MNRE.	Promotion and awareness events on Concentrating Solar Thermal (CST) project have created renewed interest among MSME and other industry users, in particular in the MSME clusters that are now specifically targeted and have experience in working on GEF project on energy efficiency.	☐

[8] Published on project's website under isid4india.org, see: https://isid4india.org/pdf/Technology%20Information%20package.pdf.
[9] New risk added in reporting period. Check only if applicable.

	(i) Risks at CEO state	Risk Level FY 22	Risk Level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk[9]
3	Professional capacity to develop standards is limited and/ or unavailable. Also, work on development of standards is initiated in parallel or is already underway in national/ international standards bodies.	L	M	- Qualified consultants will be contracted to assist in the work. the national standards body, BIS, is an important stakeholder and can be approached to be a member of the project Advisory Committee. This will ensure the necessary coordination of actions. - Through BIS, contact and follow-up with the relevant international standards body (ISO) will be maintained.	The project had earlier engaged an international specialized CST consultancy to provide the technical advisory for projects to ensure that installation conducted under the project are state of the art for international standards. The project has circulated the RFQs for hiring National and International expert agencies. The project has process for the selection of international expert agency. The project support will be reduced once the demand and quality of CST projects will increase. Financing scheme (incl. grants schemes) will need to sufficiently distinguish between the performances of the different CST technologies and, therefore, require the market to supply only qualitative systems. The project will promote new entrepreneurs to acquire the capabilities to offer technical advice on system integration and engineering for solar systems.	☐
4	Persons trained for testing are transferred or assigned other responsibilities	L	M	Since many people will be trained, if some of them are transferred it may lead to a temporary slowdown but should not lead to a complete stoppage of testing.	Implementation of the first two demonstration projects has been completed and company staff have been trained for continued operation and maintenance. The project has also validated the innovative type of CST technology using for the wastewater treatment and the same technology will transfer to use in the identified MSME clusters. The project team including the state nodal agency visited demonstration sites to see the installed project and observed that the systems are maintained by the trained operator at the project site.	☐

	(i) Risks at CEO state	Risk Level FY 22	Risk Level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk[9]
5	Failure to trigger positive responses from energy efficiency / renewable energy consultants and other such service providers for their involvement and development of capabilities in CST area.	L	L	The response will depend on industry growth and their perception of business opportunities in CST. The promotion and development activities of MNRE under the Jawaharlal Nehru National Solar Mission and of this project should lead to improved perception.	The project's targeted increasing reliability and performance of CST technology along with the awareness generation activities across the country to promote the CST market, project has also recognized CST system integrators for successful project implementation. Currently, most consultation is being provided by manufacturers themselves. The training activities being planned under the project would be enabling this. Also, there is a limited number of CST manufacturers/suppliers in the country (only 10-12 major players) and there is limited interactions with academia and research institutions. A CST knowledge platform / relevant documents for the industries is to be established to increase confidence among different stakeholders and provide opportunities to exchange ideas, experiences and new technology developments.	☐
6	Feasibility studies and Detailed Project Reports do not get converted into prospective projects.	L	L	By defining suitable selection criteria for providing support for these studies, projects will be scrutinized and those having greater likelihood of implementation will be adequately supported.	Identified MSME clusters having heat demand profiles that match CST capability, rising energy prices and involvement of MSME ministry this is expected to easy for remainder of the project period. The project finalised 10 DPRs during the period and it expected to convert into the prospective projects.	☐
7	Delay in commissioning of demonstration and replication projects and availability of results	M	M	The status of projects will be regularly reviewed, and any necessary corrective steps will be promptly taken.	Since the funding mechanism has changed in January 2022 and it directly provided through UNIDO to the beneficiaries and the financial implications would also be borne by the agency. However, since the project is yet to implement CST installations, the risk has not been experienced and no action has been taken. .	☐
8	After the project is commissioned, demonstration and replication project participants do not comply fully with the stipulated terms and conditions.	L	L	Support will be terminated to projects which are not in compliance, and there will be provisions for cost recovery in such cases. Other projects will then be considered for support.	This risk has not materialized in the project's execution.	☐

	(i) Risks at CEO state	Risk Level FY 22	Risk Level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk[9]
9	Sustainable funding mechanism cannot be established	M	M	The project as of PPG phase will initiate the design and setup of a financing mechanism for sustainable replication. The process will be regularly reviewed, and identified barriers addressed.	UNIDO along with MNRE and IREDA had developed a single window financial support system for the CST demonstrations under the project. The termination of the grant funding, included in the single window funding system, has rendered it ineffective, and hence this scheme was terminated. In addition to the GEF grant, the discussions are ongoing to make CST investments eligible for existing MSME incentive schemes and/or initiate and launch specific additional energy efficiency and renewable energy schemes customized to MSME segment.	☐
10	Reduction in prices of fossil fuels or electricity	L	L	A reduction in the international price of oil, gas, coal and/or biomass will have a marginal effect in undermining the economics of CST in India for future installations. The existing installations will continue to operate since after the upfront investment, operating costs are very low. Moreover, with improved efficiency of systems and with economies of scale, the cost of CST is also going to go down, hence improving project economics.	The low-cost fuel prices (e.g Coal, PNG, diesel etc) have increased since early 2023, indeed improving the techno-economic feasibility for CST applications.	☐
11	Failure in obtaining performance data from pilot and demonstration projects	L	L	Before the grant disbursement, the potential beneficiaries will be asked to provide an undertaking that performance data will be provided to the Project management unit and if required, representative from the project management unit will be allowed to visit the installations and prepare case studies.	The performance data for supported CST demonstrations have been obtained by the industries and prepared few case studies of the CST project	☐
12	Non availability of reliable DNI data for developing reporting parameters and for performance assessment of CST systems	L	L	MNRE has installed monitoring stations to address this risk and under the SRRA initiative, 51 weather stations have already been established, DNI data from which would be obtained before the project kicks off. In case of non-availability of this data, other reliable data sources like NREL, NASA SSE, IMD would be provided.	The report prepared under the project for the 5 different locations in India helped to the industries to design the appropriate system.	☐
13	Climate change risk	L	L	CST technologies harnessing solar power are very little impacted by climate change.	Focus on smaller size of the CST installations that are less vulnerable to extreme weather events (in particular storms and strong winds)	☐

	(i) Risks at CEO state	Risk Level FY 22	Risk Level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk[9]
14	Failure to secure the ongoing support in form of capital subsidy from MNRE	H	L	MNRE is the most important stakeholder in the program and MNRE's presence in the project management cell and the steering committee will ensure better coordination and implementation of pilot projects and other project components. Large number of projects and preparation of DPRs and PFRs will also result in effective streamlining and improved accessibility of MNRE subsidy program.	No risk experienced so far, Ministry of Micro, Small and Medium Enterprises (Mo MSME) as the executing agency for the CST project is constantly updated on the progress made under the project. Mo MSME has been also closely involved in developing the financial loan instrument with SIDBI to be support under the financial package. The direct GEF grant for the CST project under the UNIDO-GEF-MSME help to secure the project in identified MSME clusters.	☐

2. If the project received a sub-optimal risk rating (H, S) in the previous reporting period, please state the actions taken since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this

Not applicable.

3. Please indicate any implication of the **COVID-19** pandemic on the progress of the project.

The project effect during the COVID-19 pandemic period and reported PIRs21 and 22 but the current PIR period it is not affect the implementation of the project.

4. Please clarify if the project is facing delays and is expected to request an **extension**.

The actual project implementation plan was interim reviewed by the Ministry of Micro, Small and Medium Enterprises on 2nd May 2023 and it was suggested by the Chairman, PSC in the 1st meeting of PSC held on 3rd Feb 2023. The project plan for execution of ongoing activities was also discussed in the 3rd TWG meeting held on 12th May 2023 and ratified by the TWG committee members and recommended for approval in PSC meeting. The 2nd PSC meeting may plan on 3rd August 2023.

The TWG committee members understood that in order to achieve the desired target set in the project for the demonstration and replications of CST projects, the identified MSME clusters and industries may take additional time and therefore the TWG committee members agreed in the meeting for the extension of GEF-5 funded UNIDO's solar project. The committee approved on Concentrated Solar Thermal project on "No-Cost Extension of Project" up to July 2025. UNIDO project team should focus more on the implementation of demonstration and replication projects so that it may be completed as per the timelines. .

At the end of the current reporting period, therefore, further extension appears necessary.

5. Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

The overview of key conclusion and recommendations were reported in the earlier PIR.

Due to operational halt of project activities in 2021, an independent terminal evaluation was conducted in 2021, and its conclusions and recommendations published in early 2022[10]. As detailed below, the TE found the project to be moderately unsatisfactory, particularly as project interventions had at the time not yet resulted in significant uptake of and investments in CST installations in the manufacturing sector.

#	Evaluation criteria	Rating
A	**Progress to impact**	**3 (Moderately Unsatisfactory)**
B	**Project design**	**4 (Moderately Satisfactory)**
1	• Overall design	4 (Moderately Satisfactory)
2	• Logframe	4 (Moderately Satisfactory)
C	**Project performance**	**4 (Moderately Satisfactory)**
1	• Relevance	5 (Satisfactory)
2	• Effectiveness	3 (Moderately Unsatisfactory)
3	• Efficiency	3 (Moderately Unsatisfactory)
4	• Sustainability of benefits	4 (Moderately Likely)
5	• Coherence	4 (Moderately Satisfactory)
D	**Cross-cutting performance criteria**	**3 (Moderately Unsatisfactory)**
1	• Gender mainstreaming	3 (Moderately Unsatisfactory)
2	• M&E: ✓ M&E design ✓ M&E implementation	3 (Moderately Unsatisfactory)
3	• Results-based Management (RBM)	3 (Moderately Unsatisfactory)
E	**Performance of partners**	**3 (Moderately Unsatisfactory)**
1	• UNIDO	3 (Moderately Unsatisfactory)
2	• National counterparts	2 (Unsatisfactory)
3	• Donor	4 (Moderately Satisfactory)
F	**Overall assessment**	**3 (Moderately Unsatisfactory)**

Summary conclusion. There is ongoing interest in CST technologies demonstrated through a growing pipeline of proposals stimulated by the project. Yet, assumptions made at design regarding national government and industry commitment and resources available to support project initiatives have not eventuated, constraining project progress. Commitment at State level appears to be a critical success factor that could be given stronger attention.

Recommendation 1: UNIDO to extent the project duration at no-cost for about two years. The revised action plan for the extension period should include:
1. Alternative government partnerships to ensure active implementation, and improved access to resources (expertise and finance) capable of supporting viable proposals in the pipeline.

2. Allow sufficient time to pursue the substantial demand in the current pipeline for effective national procurement, installation, and commissioning of the CST systems.

3. Ensure the availability of technical support to develop modular approaches to several key focus industries.

4. Strengthened capacity development approaches for local service providers.

[10] Accessible from: https://downloads.unido.org/ot/30/50/30509403/Evaluation%20report%20on%20Promoting%20business%20models%20for%20increasing%20penetration%20and%20scaling-up%20of%20solar%20energy%20in%20India%20(2022).pdf

Recommendation 2: UNIDO should ensure improved project management and communications support to address current implementation weaknesses. The project management unit should:
5. Establish demonstration sites and respective skills transfer processes for scale up relevant to current and prospective industries where installations are available (not only project-supported sites).

6. Establish sustainability mechanisms for operation beyond the project.

The two main recommendations were in full incorporated in the revised project completion plan, approved in December 2021, including the change of national execution agency. Implementation efficiencies are now being observed from close alignment and synergies between implementation of the current project and the parallel project on energy efficient technologies in MSME clusters, in terms of utilization of existing industry platforms and networks, close alignment with MoMSME and its related initiatives on energy and manufacturing competitiveness (including the Zero Effects Zero Defects Scheme, ZED). This has also streamlined project management and communications and is expected to pave the way for accessing MSME focused financing for implementation of CST technology in manufacturing MSMEs.

IV. Environmental and Social Safeguards (ESS)

1. As part of the requirements for **projects from GEF-6 onwards**, and based on the screening as per the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the project?

☐ Category A project

☐ Category B project

☐ Category C project

(By selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

	E&S risk	Mitigation measures undertaken during the reporting period	Monitoring methods and procedures used in the reporting period
(i) Risks identified in ESMP at time of CEO Endorsement	N/A	N/A	N/A
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)	N/A	N/A	N/A

V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

UNIDO implements with funding support from the Global Environment Facility (GEF) the project on *"Promoting business models for increasing penetration and scaling up of solar energy"* which is aimed at promoting, demonstrating and scaling up the application of concentrated solar thermal (CST) technologies for process heating (and possibly cooling) in manufacturing sector in India. CST captures solar radiation and turns this into heat (hot water or air, steam, or any other heat transfer medium) which can then be used

for heating or cooling of manufacturing, industrial, utility and other processes and systems. This Project has already made valuable achievements particularly through the development and publication of knowledge products, including CST mapping against industrial processes, CST roadmap and CST technology packages, policy reviews covering relevant boiler regulations, building codes and domestic manufacturing, awareness raising and other enabling activities and the development and promotion of CST demonstration projects.

1. The project during 2015-2021 was executed through the Ministry of New and Renewable Energy (MNRE) with the India Renewable Energy Development Agency (IREDA) acting as the promotor and administrator of its then financial support package.
2. From January 2022, the project is executed through the Ministry of Micro, Small and Medium Enterprises (MoMSME) to focus specifically on CST applications in MSME manufacturing units in at least five following clusters, respectively: Ankleshwar (chemicals manufacturing in Gujarat); Jorhat (tea processing in Assam); Medak (pharmaceuticals manufacturing in Telangana); Surat (textile processing in Gujarat); and Vellore (rice milling in Tamil Nadu).
3. MSMEs in these clusters require low to medium temperature heat, which potentially can be met through solar process heating using CST technologies. Among these five target states, Gujarat, Telangana, Karnataka, Goa and Tamil Nadu have favourably high direct normal irradiation (DNI) and high number of sunny days, whereas Assam has lower DNI but relatively high combined direct and diffuse solar irradiation that can be captured with Compound Parabolic Collectors.
4. In 2023, the project expanded to include Goa for pharmaceutical and Bidar pharmaceutical manufacturing in Karnataka) with total seven identified MSME clusters.

UNIDO and MoMSME have been working with these six target clusters (excluding Goa) since 2017 for the demonstration and scaling up of the application of and investments in replicable energy efficient technologies (see: https://www.isid4india.org/promoting-market.php).

The following are the major progress under the project during the PIR period.

1. The Second meeting of Technical Working Group (TWG) Committee was held on 1st February 2023 which was reviewed 2 Nos of Detailed Project Reports (DPRs) for the Surat Textile Cluster and 9 Nos of preliminary feasibility analysis for CST applications in Vellore and Jorhat Clusters.
2. The first Project Steering Committee (PSC) meeting on the solar project under the UNIDO-GEF-MSME project was held on 3rd February 2023. The committee approved the technical and financial support of 2 textile industries based on the DPR reviewed and recommend by the TWG committee members. The committee also approved the procurement of services for the following two assignments assigned to the National Consultants which were awarded in November & December 2022.
    - National solar expert for providing technical due diligence & preparation of DPRs on concentrated solar thermal technology for industrial process heating.
    - National CST support agency for providing technical due-diligence, capacity building and communication over-sight on concentrated solar thermal technology for industrial process heating.
3. The project organised business meets on 22 March 2023 under the Jorhat Tea cluster for the awareness of CST programme and generate Expression of Interest, also undertook engagement activities in all other clusters and another business meet on CST was organized on 10th April 2023 in association with Bidar Pharma Cluster. The pharmaceutical industries have submitted an Expression of Interest for the preparation of a Pre-feasibility report under the UNIDO-GEF-MSME project.
4. TWG committee members have already approved a total of 10 DPRs in the TWG meetings held on 1st Feb 2023 and 12th May 2023 and it ratified for the approval in next PSC meeting scheduled to take place on 3rd August 2023.
5. The RFQ on International Expert agency for the provision of technical due-diligence, capacity building, and communication and oversight on CST for industrial process heating was floated in September 2022 and received two bids but since the quote was beyond the budget limit, UNIDO has revised the TOR and is ready to refloat the procurement process.
6. Organised an interactive meeting with the members of North East Tea Association (NETA), Golaghat and the tea industries expressed interest to consider and implement concentrating solar thermal project, as reflected in submission of expression of interest for the preparation of Pre-feasibility reports.

7. Goa Energy Development Agency (GEDA) has requested MoMSME and UNIDO to consider Goa for Pharmaceutical industry under the purview of the UNIDO-GEF MSME project and it approved in the 1st PSC meeting held on 3rd Feb 2023.

Outcomes:

- Total 10 DPRs prepared and approved by the TWG committee members and recommended for approval in 2nd Project Steering Committee meeting.
- The project awarded a contract to the National Consultants under the UNIDO-GEF-MSME project to support MSME industries for the preparation of 15 DPRs and preparation for procurement of CST installations.

Challenges:

The MSME industries are using low-cost fuel and the major challenges for the adoption of CST project is the initial investment cost and the higher payback period of the project. The space availability is also the major challenge as they have a Corrugated roof top and strengthening of the roof top for the security purpose is major concerned.

2. Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other Partners/Stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

UNIDO prepared and submitted a project completion proposal (aligned with GEF5 energy efficiency project) to the Ministry of MSME (on 2 November 2021). Ministry of MSME confirmed its agreement and commitment to act as execution agency to UNIDO and GEF OFP (on 30 November 2021), upon which GEF OFP officially requested UNIDO (on 10 December 2021) to restart the project activities with the Ministry of MSME.

The project organised 3 Technical Working Group (TWG) committee meetings with two are conducted on 1st February 2023 and 12th May 2023 and one Project Steering Committee (PSC) meeting on 3rd February 2023. The committees are closely monitored the project and appreciated for the progress of project activities.

3. Please provide any **relevant stakeholder consultation** documents.

UNIDO organized and hosted information and awareness meetings on application of CST in two clusters (Jorhat, and Vellore). These resulted in initial expressions of interest of industries to be considered for potential pilot projects. The information and awareness meetings though have not been documented in separate consultation documents.

VI. Gender Mainstreaming

1. Please provide information on **progress on gender-responsive measures** and **gender-sensitive indicators** as documented at CEO Endorsement/Approval (in the project results framework or gender action plan or equivalent).

The CEO Endorsement Document recognised the limited specific contributions of the present project to gender mainstreaming, save for fostering and enabling participation of women in project activities, particularly its training and capacity building. However, no training activities could be realized during the reporting period.

The 2021 Terminal Evaluation noted following on gender mainstreaming.

“Gender was not significantly considered at design. Project design identified women as indirect beneficiaries resulting from broader change envisioned under the Project. However, the limited effectiveness of the Project undermines the potential for these flow-on benefits. Nonetheless, there are some isolated examples of benefits for women such as in the Uttarakhand Cooperative Resham Federation Case Study. However, the Project did not integrate gender considerations at design or during implementation”.

VII. Knowledge Management

1. Please elaborate on any **knowledge activities / products** (when applicable), as outlined in knowledge management approved at CEO Endorsement / Approval.

The project has produced various knowledge products/technical reports in regard to review of state specific CST manufacturing policies, review and recommendations for CST integration in boiler regulations and review and recommendations for CST integration in building standards. The reports have been completed and published on the project's website under the isid4india.org domain, accessible through https://isid4india.org/solar-energy.php.

2. Please provide any **relevant knowledge management mechanisms** / **tools** that the project has generated.

The above referred knowledge products are accessible through the project's website under the umbrella website on inclusive and sustainable industrial development for India, see: https://www.isid4india.org/solar-energy.php.

VIII. Implementation progress

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

1. The Second & Third meeting of Technical Working Group (TWG) Committee was held on 1st February 2023 & 12th May 2023 under the chairmanship of Director, MoMSME and also the first Project Steering Committee (PSC) meeting under the UNIDO-GEF-MSME of solar project was held on 3rd February 2023 under the chairmanship of Additional Secretary & Development Commissioner, MoMSME cum PSC chairman and approved for the implementation of two projects, Contract services of two assignments and included Goa for pharmaceutical as a new cluster under the UNIDO-GEF-MSME project
2. Procurement of two following services under the UNIDO-GEF-MSME Solar project has been awarded:
   2.1 RFQ on National solar expert for providing technical due diligence & preparation of Detailed Project Reports (DPRs) on concentrated solar thermal technology for industrial process heating.
   Status: Assignment on preparation of DPRs awarded to Global Sustainable Energy Solutions India Pvt. Ltd. (GSES), New Delhi on 11th November 2022 and it based on the RFQ floated and circulated in September 2022. UNIDO consultant "GSES" team prepared 13 DPRs and 10 are already reviewed and recommended for approval in TWG meeting.
   2.2 RFQ on National CST support agency for providing technical due-diligence, capacity building and communication over-sight on concentrated solar thermal technology for industrial process heating.
   Status: Assignment on National CST support agency for providing technical due-diligence, capacity building and communication over-sight on concentrated solar thermal technology for industrial process heating. Awarded to National agency M/s APITCO Ltd, Hyderabad on 22nd December 2022 and it is based on the RFQ floated in October 2022. The project team reported the progress of APITCO in 3rd TWG meeting for the cancellation of contract due to lack of interest, therefore the project restarted the planning for hiring a consulting assignment on National CST support agency for providing technical due-diligence, capacity building and communication over-sight on concentrated solar thermal technology for industrial process heating.
3. RFQ for International Expert agency for the provision of technical due-diligence, capacity building, and communication and oversight on CST for industrial process heating was floated in September 2022.UNIDO PMU received two bids but neither reflected properly on specific project requirements and both exceeded the foreseen budget allocation. UNIDO is working on revision of TOR and is ready to refloat the procurement process.

4. An interactive meeting was held with the members of North East Tea Association (NETA), Golaghat (Assam) on 6th July 2022 in presence of tea industries. They submitted expressed interest to consider and implement of concentrating solar thermal project.

5. The materialization of additional solar projects may require TWG members to consider for approval and suggestion of project propose to Rallis India Ltd (subsidiary of Tata Chemical) & Goa Medical Collage under the UNIDO-GEF-MSME project in 1st PSC meeting but the committee suggested to focus more in MSME clusters, so they considered only Goa Medical Collage for the technical and financial support for the CST project.
6. Total 10 DPRs of the concerned industries under the MSME clusters (viz Surat textile cluster, Ankleshwar chemical cluster, Vellore rice mill and Jorhat tea cluster) have been prepared and reviewed by the TWG members under the UNIDO-GEF-MSME project. A listing of all DPRs with location and system sizes is enclosed as **annexure.**
7. The PSC has agreed and approved the technical and financial supports for the implementation of CST project activities in Goa under the UNIDO-GEF-MSME project. The committee also agreed to support Goa Energy Development Agency in organising business meet/ workshops on CST including training programme.
8. The tender documents of the approved two CST projects under the Surat Textile cluster were reviewed by the concerned industries. The project team organised pre-bid meeting with CST manufactures in presence of industries on 9th & 10th May 2023.

Outcomes:

Based on the suggestions and decisions taken during a meeting organized under the Mo MSME, the UNIDO team prepared 25 Pre-feasibility reports (PFRs) for Concentrating Solar Thermal Project and submitted them to the concerned industries.

With a continuous follow-up by the UNIDO's National technical expert with the industries and also review of the PFRs (Pre-feasibility reports), a total 10 DPRs were prepared and approved by TWG members and also recommended for approval in the upcoming 2nd Project Steering Committee meeting.

The project awarded two assignments to the National Consultants under the UNIDO-GEF-MSME project to support MSME industries.

Challenges:

The major challenges for the adoption of CST project are the initial investment cost for the CST project as the DPRs prepared under the project reflects the higher payback period of the project.

2. Please briefly elaborate on any **minor amendments**[11] to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

☒	Results Framework	The results framework has been maintained, yet its application has been refocused on Six selected clusters with high potential for CST application, to substitute for the sector- and location-agnostic approach adopted at CEO approval stage.
☐	Components and Cost	N/A
☒	Institutional and Implementation Arrangements	Project coordination arrangements have been updated and streamlined to achieve synergies with the implementation of the parallel GEF project on Market Transformation for Energy Efficient Technologies in MSMEs.

[11] As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

		Project Steering Committee has been re-established and Working Technical Group (for experts' inputs and reviews)
☒	Financial Management	The Project's financial support for investment in CST projects availed from the UNIDO to beneficiary companies on the basis of partial reimbursement of actual costs. The change to reimbursement of actual costs, rather than benchmark costs per square meter of collector area, will encourage innovation and use of advanced components, which typically have higher per unit costs, but do improve system performance, fuel savings and co-benefits. The financial assistance will be conditional on inclusion of either an Annual Maintenance Contract for a minimum of 5 years or operation based on a renewable energy service contracting model. UNIDO's financial assistance in terms of direct grant sanction by the Project Steering Committee (PSC) at the recommendation of Technical Working Group, the financial support extended equally between demonstrations (first time applications in terms of technology or application) and replication/scale up (repeat of applications already demonstrated in comparable setting). The maximum financial support would be 30% for demonstration projects with a maximum of 150 lakhs rupees per project and 15% for replication projects, with maximum financial support of I00 lakhs rupees INR per CST project (solar parts only). Eligible project costs are limited to solar thermal system with adequate thermal monitoring, yet excluding auxiliary costs, such as site preparation, boiler, absorption chiller. The project's financial contribution will be equally split, i.e., 1 MUSD each for demonstration and replication projects. Assuming a slightly higher unit price per square meter for demonstration (INR35,000) than for replication projects (INR25,000), the project could then notionally provide financial support for some 26,000m^2 of collector area.
☒	Implementation Schedule	With the change of execution agency and adoption of a refocused strategy for project completion to project has been extended until 31 December 2023. The project proposed in TWG and ratified for the PSC approval for the extension of project on no-cost extension of solar project to complete the ongoing activities by 31st July 2025.
☒	Executing Entity	National execution agency was changed to Ministry of MSME, with effect of 1 January 2022
☐	Executing Entity Category	N/a
☐	Minor Project Objective Change	N/a
☐	Safeguards	N/a
☐	Risk Analysis	N/a
☐	Increase of GEF Project Financing Up to 5%	N/a
☐	Co-Financing	N/a
☒	Location of Project Activities	Priority locations for implementation and investment in CST were confirmed with the selection of high potential clusters, respectively in Assam (Jorhat), Gujarat (Ankleshwar and Surat), Telangana (Medak), Tamil Nadu (Vellore) and Goa
☐	Others	n/a

3. Please provide progress related to the **financial implementation** of the project.

The project expenditures up to 30 June 2023 amounted to USD 1,960,288.17 with a remaining available funds of USD 2,404,885.82, amounting to 45% implementation.

The breakdown by project input or budget line is summarized in the table below.

PARTICULARS		Total Budget	Obligation	Payments	Expenditure	Funds Available
Budget Line		USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	137,525.33	0.01	94,966.51	94,966.52	42,558.81
1500	Local Travel	117,589.15	7,346.70	117,159.65	124,506.35	-6,917.20
1700	Nat.Consult./Staff	880,590.28	17,265.72	805,648.70	822,914.42	57,675.86
2100	Contractual Services	2,915,600.79	99,430.63	511,778.71	611,209.34	2,304,391.45
3000	Train/Fellowship/Stu	99,028.61	547.97	87,058.39	87,606.36	11,422.25
3500	International Meetings	4,620.86	0.00	4,620.86	4,620.86	0.00
4300	Premises	121,670.27	228.28	139,712.24	139,940.52	-18,270.26
4500	Equipment	24,657.24	-0.03	21,153.12	21,153.09	3,504.15
5100	Other Direct Costs	63,891.47	2,295.21	51,075.50	53,370.71	10,520.76
TOTAL		4,365,174.00	127,114.49	1,833,173.68	1,960,288.17	2,404,885.82

Project expenditure by project output is included in following table.

Components	Project WBS	Total Budget	Obligation	Payments	Expenditure	Funds Available
		USD	USD	USD	USD	USD
1. Policy & Strategy	130149-1-01-01	124,746.34	3,844.04	108,229.76	112,073.80	12,672.54
2. Technology Demonstration	130149-1-01-02	2,603,459.72	109,127.84	782,600.56	891,728.40	1,711,731.32
3. Scale Up	130149-1-01-03	693,476.26	5,946.28	246,510.31	252,456.59	441,019.66
4. Capacity Building	130149-1-01-04	456,333.14	5,461.37	307,621.91	313,083.28	143,249.86
Project Management	130149-1-51-01	442,158.54	293.54	363,731.73	364,025.27	78,133.27
Independent Evaluation	130149-1-53-01	45,000.00	2,441.42	24,479.41	26,920.83	18,079.17
Project Total		4,365,174.00	127,114.49	1,833,173.68	1,960,288.17	2,404,885.82

IX. Work Plan and Budget

VII.1 Please provide **an updated project work plan and budget** for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

Project output (*)	Activities	Specific Deliverables (KPIs)	Budget Allocation (USD)	Time Line							
				2023		2024				2025	
				Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Component 2: Technology investment and application											
2.1.6 Investment level DPRs prepared for CST demonstration plants	Identification of potential CST projects in collaboration with SNAs	20+ DPRs prepared and promoted	1,088,756			Project prosed for extension until 30 June 2025 on No-Cost Extension approved by TWG members and proposed in approval by PSC members.					
	Preparation of initial and detailed project reports (**)										

2.1.7 Case study reports on GEF supported CST demonstration plants based on their performance (**)	Drafting and publication of case studies	25+ case study reports										
2.2.1 25 CST demonstration plants installed 2.2.2 CST capacity increased by 20,000 m^2 panel area with 12.5 MW_{th} capacity	Identification and promotion of standardized CST applications for five target MSME clusters and other industries	Target the installation of further 17,350 m^2 of CST demonstration projects Provide Project's financial assistance towards CST projects with some 6,850 m^2										
	Ongoing promotion of already completed and new DPRs for investment											
	Selection of demonstration projects for financial support through TWG/PSC											
	Facilitate and support installation and commissioning of demonstration projects											
	Oversee performance monitoring of commissioned CST demonstration projects											
Component 3: Scaling up												
3.2.2.2 50 CST projects with cumulative collector area of 40,000 m^2 and 124 MW_{th} and financing facility established	Preparation of initial and detailed project reports in particular for standardized CST applications in target MSME clusters and other industrial sectors (**)	Target the installation of further 32,200 m^2 of CST demonstration projects Provide Project's financial assistance towards CST projects with some 19,200 m^2	1,057,129									
	Ongoing promotion of already completed and new DPRs for investment											
	Selection of replication projects for financial support through TWG/PSC											
	Facilitate and support installation and commissioning of replication projects											

	Oversee performance monitoring of commissioned CST replication projects					[redacted]
	Develop proposal(s) for CST financing and appropriate business models, through document and case study review and industry and finance stakeholders	Proposals for CST financing, based on best practices and stakeholders' inputs				[redacted]
	Liaise with relevant government and financial institution and promote appropriate financing for CST	Improved availability of appropriate financing for CST				[redacted]
Component 4: Awareness raising and capacity building						
4.1.1 Installation, operations, maintenance and troubleshooting manuals for CST 4.1.2 Training of manufacturers, suppliers and installers of CST 4.1.3 Training of IITs and CST maintenance staff	Develop modular integrated application focused technical training programme on CST with virtual and face-to-face versions and technical support manuals	One integrated CST training programme with dual delivery mode	147,751			[redacted]
	Delivery of technical training to manufacturers, suppliers and installers	120 trainees completed training				[redacted]
	Delivery of training to IITs and CST maintenance staff	200 trainees complete training				[redacted]
	Set up of small scale CST system to support practical training at CETEE	CST instructional facility operational				[redacted]
4.1.5 Compiling and sharing CST and project information	Establishment of CST microsite under FIC-ISID knowledge portal	Microsite on CST operational		Completed		
	Continued operation and update of CST micro-site	Usage of CST microsite				[redacted]
	Compilation of final report documenting project achievements	Final report published and promoted				[redacted]

	and lessons learned									
Project coordination and monitoring										
Project coordination	Project oversight and steering through PSC	Meetings of PSC (4)	91,249.73							
	Project management, including support for PSC and TWG	Efficient and effective project execution								
Independent evaluation										
Terminal evaluation	Review and update of Project's independent Terminal Evaluation	Updated terminal evaluation report	20,000.00							

X. Synergies

1. **Synergies** achieved:

Since restart of the project activities from January 2022, the project is benefitting from synergies with the parallel implemented GEF5 project on energy efficiency in MSMEs which has already been supporting the same MSME clusters that the Project is now focussing on.

Stories to be shared (Optional)

During the PIR FY 23:

Story 1: Participate 1st International Conference on Sustainability organised by Goa State Pollution Control Board (GSPCB) and Goa Energy Development Agency (GEDA)

Dr. Rene Van Berkel, UNIDO Representative and Head, Regional Office India in his address at the 1st IESSG conference in Goa mentioned that the Triple Planetary Crisis of climate change, loss of nature & biodiversity, accumulation of waste & pollution is manmade and has one common principal course – the escalating resource use - and one solution - circular, net zero and nature positive economy.

He placed a great emphasis on the fact that decarbonizing manufacturing involves multipronged strategies including resource and energy efficiency, material and fuel substitutions, innovation, sectoral transformation, and carbon capture, use and storage.

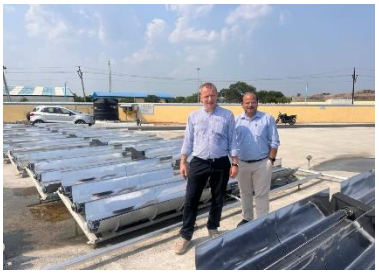
UNIDO Representative also mentioned in the conference that light industry sectors have good potential to implement Concentrating Solar Thermal (CST) technologies for process heating and cooling, including in Goa pharmaceutical sector, to contribute significantly to helping to achieve the national renewable energy targets.

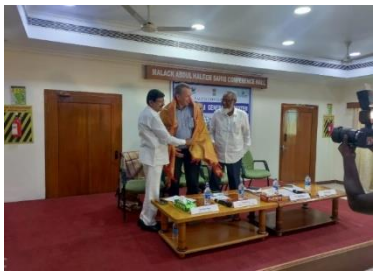
The theme of the conference to build a sustainable future and it is help full for our project as a part of knowledge sharing and understand the potential to interact more under the UNIDO's prospects, the summit aimed to present sustainability solutions and best practices, build, network and enhance learning experiences and provide a platform for sharing of experiences, success stories and innovative ideas.

The brief of the dialogue was also uploaded on twitter:
https://twitter.com/UNIDO_India/status/1622443553480740872

Story 2 : Validation function of CST technology in Ranipet Tannery Effluent Treatment Co. Pvt Ltd (RANITEC) at Ranipet(https://www.ranitec.com/)

The validation function on Concentrating Solar Thermal system using for the process heat application organised on 1st June at RANITEC in RANIPET. The installed CST project as a showcase achievement to promote xCPC (Cross Compound Parabolic Concentrator) technology in identified MSME clusters under the UNIDO-GEF-MSME project.





Following are the key observation points;

- Chennai Environmental Management Company of Tanners (CEMCOT) installed Concentrating Solar Thermal (CST) system which is used for steam generation for use as its Ranipet Efficient Treatment Company (Ranitec).
- The system installed 1710 m^2 of collector area using cross Compound Parabolic Concentrator with guaranteed steam generation capacity of 1.0 ton/hr on daily. The CST plant is integrated with its existing boiler which serves the Zero Liquid Discharge (ZLD) section within the plant.
- The project installed with the objective to reduce coal and wood use in the boiler and the associated operational expenses and Go Green by reducing the carbon footprint of the plant in line with the vison of the RANITEC to go natural and self-sustain.
- The installed CST was commissioned and inaugurated in February 2023 at RANITEC to generate steam for the operation of ZLD system. The system was designed, supplied, and installed by EMSOL Innovation Pvt Ltd, with funding support from central and state government within the framework of upgradation of ZLD systems.
- The United Nations Industrial Development Organization (UNIDO) promotes and facilitates the use of CST technologies for process heating in light industrial MSME clusters, such as Vellore rice milling cluster, in cooperation with the Ministry of MSME. At a validation function on 1 June 2023 at Ranipet, Rene Van Berkel, UNIDO Representative for India, applauded CEMCOT, Ranipet and EMSOL on successful completion of the project and said that the project is a leading example of use of solar technology to green the thermal energy requirements of industries.

In short, UNIDO representative has informed that the UNIDO has been working with the Ranipet Common Effluent Treatment Plant (RANITEC) to demonstrate clean leather production techniques and practices, including through provision of mechanical screen, decanter centrifuge, floating aerators for degassifier etc.
RANITEC was part of the UNIDO Regional Leather Programme for South-East Asia and was considered as a model CETP.
UNIDO project team has also informed in the event that the solar thermal technology using for the wastewater treatment is highly efficient and the project may consider promoting the same technology to identified MSME clusters under the UNIDO-GEF-MSME project.

'ராணிடெக்' சுத்திகரிப்பு நிலையத்தில் சூரிய ஒளி நீராவி உற்பத்திப் பயன்பாடு

ஐக்கிய நாடுகள் தொழில் வளர்ச்சி அமைப்பின் இந்தியப் பிரதிநிதி பாராட்டு

ராணிப்பேட்டை ஜூன் 1: 'ராணிடெக்' பொது தோல் கழிவுநீர் சுத்திகரிப்பு நிலையத்தில் சூரிய ஒளி அமைப்பின் மூலம் நீராவி உற்பத்தி செய்யப்பட்டு பயன்படுத்தும் திட்டத்துக்கு ஐக்கியநாடுகள் தொழில் வளர்ச்சி அமைப்பின் இந்திய பிரதிநிதி ரெனேவான் பெர்கல் பாராட்டுத் தெரிவித்தார்.

ராணிப்பேட்டை சுற்றுவட்டாரப் பகுதிகளில் இயங்கி வரும் 92 தோல் தொழிற்சாலைகளில் இருந்து வெளியேற்றப்படும் கழிவுநீரை சுத்திகரிக்க 'ராணிடெக்' என்று அழைக்கப்படும் பொது கழிவுநீர் சுத்திகரிப்பு நிலையம் கடந்த 1995 -ஆம் ஆண்டு தொடங்கப்பட்டு சிறப்பாகச் செயல்பட்டு வருகிறது.

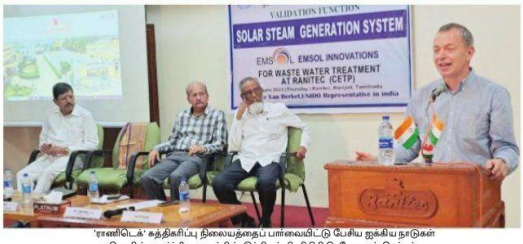
இந்த நிலையம் தோல்தொழிற்சாலைகளில் கழிவுநீரை சுத்திகரித்து நன்னீராக மாற்றி, மீண்டும் தொழிற்சாலைகளின் மற்ற பயன்பாட்டுக்கு வழங்கி சுற்றுச் சூழலையும், நிலத்தடி நீரையும் பாதுகாக்கும் பணியில் ஈடுபட்டு வருகிறது.

இந்த நிலையத்தில் தோல் கழிவுநீர் சுத்திகரிப்பு பணிக்காக ரூ.3.54 கோடி செலவில் நாட்டிலேயே முதல் முறையாக அமைக்க தொழில்நுட்பத்தில் சூரிய ஒளி அமைப்பின் மூலம் நீராவி உற்பத்தி செய்யப்பட்டு பயன்படுத்தும் திட்டம் கடந்த 2 மாதங்களுக்கு முன்பு நிறுவப்பட்டு பயன்பாட்டுக்கு வந்துள்ளது.

இதன் மூலம் நாளொன்றுக்கு சுமார் 2.3 டன் விறகு எரிப்பு நிறுத்தப்பட்டதன் மூலம் ஆண்டுக்கு ரூ.30 லட்சம் மதிப்பிலான விறகு கொள்முதல் தவிர்க்கப்பட்டு பண விரயம் குறைக்கப்பட்டும். மேலும், சுற்றுச்சூழல் மாசு பிரச்னையும் தடுக்கப்பட்டுள்ளது.

இந்த நிலையில், 'ராணிடெக்' பொது தோல் கழிவுநீர் சுத்திகரிப்பு நிலையத்தில் சூரிய ஒளி அமைப்பின் மூலம் நீராவி உற்பத்தி செய்யப்பட்டு பயன்படுத்துவதை ஐக்கிய நாடுகள் தொழில் வளர்ச்சி அமைப்பின் இந்தியப் பிரதிநிதி ரெனேவான் பெர்கல் வியாழக்கிழமை நேரில் பார்வையிட்டு உறுதி செய்தார். தொடர்ந்து நடைபெற்ற கூட்டத்தில் இந்தத் திட்டத்துக்கு அவர் பாராட்டு தெரிவித்தார்.

நிகழ்வில் தேசிய திட்ட ஒருங்கிணைப்பாளர் தேஜஸ்ரீ தால்ம், ராணிடெக் தலைவர் ஆர்.ரமேஷ் பிரசாத், நிர்வாக இயக்குநர் சி.எம்.அபருல்லா, செம்கார் நிர்வாக இயக்குநர் எஸ். சந்திரமோகன், எம்சோல் நிர்வாகிகள் ஜெய் பிரகாஷ் கர்னா, ஏ.ஸ்ராஜ், ராணிடெக் பொது மேலாளர் டி.சிவக்குமார் மற்றும் தோல் தொழில் நிறுவன உரிமையாளர்கள் உள்ளிட்டோர் கலந்து கொண்டனர்.



'ராணிடெக்' சுத்திகரிப்பு நிலையத்தைப் பார்வையிட்டு பேசிய ஐக்கிய நாடுகள் தொழில் வளர்ச்சி அமைப்பின் இந்தியப் பிரதிநிதி ரெனேவான் பெர்கல்.

தினமணி Fri, 02 June 2023
https://epaper.dinamani.com/c/72576894

XI. GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate.

Web mapping applications such as OpenStreetMap or GeoNames use this format. Consider using a conversion tool as needed, such as: https://coordinates-converter.com

Please see the Geocoding User Guide by clicking here

Location Name	Latitude	Longitude	Geo Name ID	Location and Activity Description
India, Assam	26.1852	91.7874	1278253	Awareness generation program with Tea association on 22nd March 2023 at Guwahati.
India, Karnataka	17.9366	77.4780	1267701	Awareness generation program with Tea association on 10th April 2023 at Bidar.
India, Goa	15.4580	73.8410	1271157	UNIDO project team participate 1st International Conference on Sustainability organized by GSPCB and GEDA and address by the UNIDO Representative and Head, Regional Office India. Another meeting in presence of UNIDO organised with GEDA to discuss on UNIDO-GEF-MSME project with technical and financial support for Goa Pharmaceutical industries at Taleigao.
India, Tamil Nadu	12.9203	79.3486	1255053	The project promotes and facilitates the use of CST technologies for process heating in light industrial MSME clusters, such as Vellore rice milling cluster. At a validation function on 1 June 2023 at Ranipet, UNIDO Representative for India, applauded CEMCOT, Ranipet and EMSOL on successful completion of the project and said that the project is a leading example of use of solar technology to green the thermal energy requirements of industries.

Please provide any further geo-referenced information and map where the project interventions is taking place as appropriate.

EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2022 – 30 June 2023.

2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.

3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.

4. **Results-based management**: The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings	
Highly Satisfactory (HS)	Project is expected to achieve or exceed all its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as "good practice".
Satisfactory (S)	Project is expected to achieve most of its major global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings.
Moderately Satisfactory (MS)	Project is expected to achieve most of its major relevant objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits.
Moderately Unsatisfactory (MU)	Project is expected to achieve some of its major global environmental objectives with major shortcomings or is expected to achieve only some of its major global environmental objectives.
Unsatisfactory (U)	Project is expected not to achieve most of its major global environmental objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU)	The project has failed to achieve, and is not expected to achieve, any of its major global environmental objectives with no worthwhile benefits.

Implementation Progress (IP)	
Highly Satisfactory (HS)	Implementation of all components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as "good practice".
Satisfactory (S)	Implementation of most components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.
Moderately Satisfactory (MS)	Implementation of some components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
Moderately Unsatisfactory (MU)	Implementation of some components is not in substantial compliance with the original/formally revised plan with most components requiring remedial action.
Unsatisfactory (U)	Implementation of most components in not in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU)	Implementation of none of the components is in substantial compliance with the original/formally revised plan.

Risk ratings	
Risk ratings will access the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale:	
High Risk (H)	There is a probability of greater than **75%** that assumptions may fail to hold or materialize, and/or the project may face high risks.
Substantial Risk (S)	There is a probability of between **51%** and **75%** that assumptions may fail to hold or materialize, and/or the project may face substantial risks.
Moderate Risk (M)	There is a probability of between **26%** and **50%** that assumptions may fail to hold or materialize, and/or the project may face only moderate risk.
Low Risk (L)	There is a probability of up to **25%** that assumptions may fail to hold or materialize, and/or the project may face only low risks.