**Disclaimer**

The Annual Report aims to provide an overview of the activities and achievements of UNIDO’s activities in India during 2017, covering ongoing technical cooperation projects, new project developments and engagement with government, business and other stakeholders. It aims to provide the reader with an overview of UNIDO activities in India and areas of collaboration between UNIDO and different stakeholders in India. However, it does not intend to provide any official data or comprehensive information on each individual project or activity.

The views expressed in this publication are those of the contributors and do not necessarily reflect the views of UNIDO or Govt. of India or its funding agencies. UNIDO or Govt. of India or its funding agencies do not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information contained in this publication.

© Copyright: UNIDO, 2018

Annual Report 2017: UNIDO Operations in India
Foreword

During 2017 UNIDO succeeded to consolidate and grow its portfolio and footprint in India with project activities covering the main topics of (industrial) energy efficiency, renewable energy, cleantech innovation, environmentally sound management of chemicals and waste, transfer of appropriate technology and introduction of modern and lean manufacturing practices, reaching record level of USD 10.45million on the ground implementation. UNIDO also reached out extensively to government, business and industry sectors, and civil society on the opportunities and challenges for inclusive and sustainable industrial development.

2017 marked the conclusion of the UNIDO India Country Programme (CP) 2013-2017, which had as its priority areas greening of industrial development, advancing economic competitiveness, and facilitating South-South Industrial Cooperation. A total of 24 integrated projects with a total budget of USD96 million was realized in India under this Country Programme, from the wider range of scoped potential project activities which had an indicative budget of USD170 million. Sixteen of these projects continued implementation at the start of 2018.

UNIDO started the development of the 2018-2022 UNIDO India Country Programming Framework (CPF) which aims to contribute to initiating and facilitating the transition towards inclusive and sustainable industrial development. Key Results Areas have been confirmed in regard to: productive and resilient micro, small and medium enterprises (MSMEs); solutions for climate, resources and environment; inclusive and responsible value chains and businesses; and strategic policy for industrial transformation. The CPF is expected to be finalized in mid-2018, taking further inputs from an independent country evaluation, to be conducted in the first quarter of 2018.

UNIDO is determined to continue, expand and diversify from 2018 its activities and operations in India in knowledge- and action-based partnerships geared towards industrialization for greater inclusiveness and enhanced sustainability.

René Van Berkel
UNIDO Representative
Regional Office in India
Contents

List of Abbreviations 5
1. Advocacy highlights 7
2. India country programme 11
3. Project summaries 2017 14
   Environmentally sound management and final disposal of PCBs in India 16
   Environmentally sound management of medical wastes in India 18
   Development and promotion of non-POP alternatives to DDT 20
   Promoting energy efficiency and renewable energy in selected micro, small and medium enterprises (MSMEs) clusters 22
   Promoting market transformations for energy efficiency in Micro, Small and Medium Enterprises 24
   Promoting innovative energy solutions with Ultra Low Head Micro-Hydro Power technology in India 26
   Promoting business models for increasing penetration and scaling up of solar energy 28
   Organic waste streams for industrial renewable energy applications in India 30
   Cleantech programme for SMEs in India (Global Cleantech Innovation Programme) 31
   Facility for low carbon technology deployment 33
   Sustainable cities integrated approach pilot in India (SC-IAP Climate Change) 35
   Supporting small and medium-sized manufacturers in the automotive component industry in India: Deepening and widening the services provided within the framework of the UNIDO-ACMA-DHI Partnership Programme 38
   International Centre for Inclusive and Sustainable Industrial Development (IC-ISID) 40
   Kanpur leather development project 41
   Development and adoption of appropriate technologies for enhancing productivity in the cement sector 43
   Development and adoption of appropriate technologies for enhancing productivity in the paper and pulp sector 44
   Development and adoption of appropriate technologies for enhancing productivity in the bicycle and bicycle parts sector 46
   Promotion of neem derived bio-pesticides in west Africa (Ghana, Nigeria, Sierra Leone): 47
   Strengthening the technical service capabilities of the Kenya Industrial Research and Development Institute (KIRDI) in collaboration with the Kenya Subcontracting and Partnership Exchange Programme 49
4. Outlook 2018 50
5. UNIDO Regional Office in India 54
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACMA</td>
<td>Automotive Component Manufacturers Association</td>
</tr>
<tr>
<td>BAT</td>
<td>Best Available Techniques</td>
</tr>
<tr>
<td>BEE</td>
<td>Bureau of Energy Efficiency</td>
</tr>
<tr>
<td>BEP</td>
<td>Best Environmental Practices</td>
</tr>
<tr>
<td>BSP</td>
<td>Bhilai Steel Plant</td>
</tr>
<tr>
<td>CBWTF</td>
<td>Common Biomedical Waste Treatment Facilities</td>
</tr>
<tr>
<td>CII</td>
<td>Confederation of Indian Industries</td>
</tr>
<tr>
<td>CLRI</td>
<td>Central Leather Research Institute</td>
</tr>
<tr>
<td>CP</td>
<td>Country Programme</td>
</tr>
<tr>
<td>CPPRI</td>
<td>Central Pulp &amp; Paper Research Institute</td>
</tr>
<tr>
<td>CPRI</td>
<td>Central Power Research Institute</td>
</tr>
<tr>
<td>CST</td>
<td>Concentrating Solar Thermal</td>
</tr>
<tr>
<td>DDT</td>
<td>Dichloro Diphenyl Trichloroethane</td>
</tr>
<tr>
<td>DG</td>
<td>Director General</td>
</tr>
<tr>
<td>DHI</td>
<td>Department of Heavy Industry, Ministry of Heavy Industry and Public Enterprises, Government of India</td>
</tr>
<tr>
<td>DIPP</td>
<td>Department of Industrial Policy and Promotion, Ministry of Commerce and Industry Government of India</td>
</tr>
<tr>
<td>EESL</td>
<td>Energy Efficiency Services Limited</td>
</tr>
<tr>
<td>ESCAP</td>
<td>Economic and Social Commission for Asia and the Pacific</td>
</tr>
<tr>
<td>FICCI</td>
<td>Federation of Indian Chambers of Commerce and Industry</td>
</tr>
<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
<tr>
<td>GoI</td>
<td>Government of India</td>
</tr>
<tr>
<td>IARPMA</td>
<td>Indian Agro and Recycled Paper Mills Association</td>
</tr>
<tr>
<td>IC-ISID</td>
<td>International Centre for Inclusive and Sustainable Development</td>
</tr>
<tr>
<td>IIT</td>
<td>Indian Institute of Technology</td>
</tr>
<tr>
<td>INMA</td>
<td>International Newsmedia Marketing Association</td>
</tr>
<tr>
<td>IPMA</td>
<td>Indian Paper Manufacturers Association</td>
</tr>
<tr>
<td>IPRs</td>
<td>Intellectual Property Rights</td>
</tr>
<tr>
<td>IREDA</td>
<td>Indian Renewable Energy Development Agency</td>
</tr>
<tr>
<td>ISA</td>
<td>International Solar Alliance</td>
</tr>
<tr>
<td>JNNSM</td>
<td>Jawaharlal Nehru National Solar Mission</td>
</tr>
<tr>
<td>KIRDI</td>
<td>Kenya Industrial Research and Development Institute</td>
</tr>
<tr>
<td>LDCs</td>
<td>Least Developed Countries</td>
</tr>
<tr>
<td>LLIN</td>
<td>Long Lasting Insecticidal Nets</td>
</tr>
<tr>
<td>MDONER</td>
<td>Ministry of Development of North Eastern Region, Government of India</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MNRE</td>
<td>Ministry of New and Renewable Energy, Government of India</td>
</tr>
<tr>
<td>MoEFCC</td>
<td>Ministry of Environment, Forests and Climate Change, Government of India</td>
</tr>
<tr>
<td>MoES</td>
<td>Ministry of Earth Science, Government of India</td>
</tr>
<tr>
<td>MoHUA</td>
<td>Ministry of Housing and Urban Affairs, Government of India</td>
</tr>
<tr>
<td>MoMSME</td>
<td>Ministry for Micro-, Small- and Medium Enterprises, Government of India</td>
</tr>
<tr>
<td>MSMEs</td>
<td>Micro, Small and Medium Enterprises</td>
</tr>
<tr>
<td>NAPCC</td>
<td>National Action Plan on Climate Change</td>
</tr>
<tr>
<td>NCCBM</td>
<td>National Council for Cement and Building Materials</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Government Organisation</td>
</tr>
<tr>
<td>NIP</td>
<td>National Implementation Plan</td>
</tr>
<tr>
<td>NNCC</td>
<td>National Neem Coordinating Cell</td>
</tr>
<tr>
<td>NRDC</td>
<td>National Research Development Corporation</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>PA</td>
<td>Preparatory Assistance</td>
</tr>
<tr>
<td>PCB</td>
<td>Poly Chlorinated Biphenyls</td>
</tr>
<tr>
<td>PMU</td>
<td>Project Management Unit</td>
</tr>
<tr>
<td>POPs</td>
<td>Persistent Organic Pollutants</td>
</tr>
<tr>
<td>PPG</td>
<td>Project Preparation Grant</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>PSAC</td>
<td>Project Steering &amp; Advisory Committee</td>
</tr>
<tr>
<td>PSC</td>
<td>Project Steering Committee</td>
</tr>
<tr>
<td>PTC</td>
<td>Directorate for Programme Development and Technical Cooperation, UNIDO</td>
</tr>
<tr>
<td>RDCBSM</td>
<td>Research and Development Centre for Bicycles and Sewing Machines</td>
</tr>
<tr>
<td>RECP</td>
<td>Resource Efficient and Cleaner Production</td>
</tr>
<tr>
<td>RENPAP</td>
<td>Regional Network on Pesticides for Asia and the Pacific</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SE4ALL</td>
<td>Sustainable Energy for All</td>
</tr>
<tr>
<td>SIDBI</td>
<td>Small Industries Development Bank of India</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and Medium Enterprises</td>
</tr>
<tr>
<td>TC</td>
<td>Technical Cooperation</td>
</tr>
<tr>
<td>TERI</td>
<td>The Energy and Resources Institute</td>
</tr>
<tr>
<td>ULH-MHP</td>
<td>Ultra-Low Head – Micro Hydro Power</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNDAF</td>
<td>United Nations Development Assistance Framework</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
</tr>
<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organization</td>
</tr>
<tr>
<td>UPLIA</td>
<td>Uttar Pradesh Leather Industries Association</td>
</tr>
<tr>
<td>UREDA</td>
<td>Uttarakhand Renewable Energy Development Agency</td>
</tr>
<tr>
<td>UNSDF</td>
<td>United Nations Sustainable Development Framework</td>
</tr>
<tr>
<td>VEF</td>
<td>Vienna Energy Forum</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
1. Advocacy highlights

In 2017 UNIDO achieved steady progress in the implementation of its ongoing projects covering the pillars of greening of industry and advancing economic competitiveness in India and support for South-South Industrial Cooperation with Africa. Moreover, UNIDO intensified and strengthened its engagement with the business and industry sector, in its role as advocate and knowledge partner for inclusive and sustainable industrialization, in particular in accordance with Sustainable Development Goal 9 (SDG9). The following summarizes the main UNIDO engagements in the country with government, business and industry and civil society during the year. This is complemented by project specific activity summaries in Section 3 of this Annual Report.

INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

Inclusive and Sustainable Industrial Development (ISID) is aimed at enhancing the contribution of industries to the creation of shared prosperity, to the enhancement of economic competitiveness and to the safeguarding of the environment, facilitated by strategic policies, implemented by strong and knowledgeable institutions. It requires an industrial transformation to ‘factories fit for the future that were basically already urgently needed yesterday’. Such factories produce quality products that are sought after by markets in competitive manner, provide a decent reward to all involved in and/or affected by industrial production and have conservation of environment, resources and climate engrained in their business DNA.

February

Mr S.N. Tripathi, Additional Secretary and Development Commissioner (Ministry of MSME), joined Indian clean tech start-ups that had benefitted from UNIDO assistance for the finale of the Cleantech Open Global Competition held in Silicon Valley on 10 February 2017. Mumbai’s Atomberg Technologies won the energy efficiency category for its efficient ceiling fans, and Bengaluru’s GIBSS received the top innovation award for its ground-breaking work on developing geothermal energy for building AC systems.

On February 27, 2017, Mr René Van Berkel assumed the position as UNIDO Representative for the Regional Office in India.
March

UNIDO contributed to the launch of the India UN Business Forum in Mumbai on 22-23 March 2017. The Forum fosters partnerships between business sector and UN agencies to scale up practical solutions towards the Sustainable Development Goals (SDGs), in particular in the areas of: affordable housing and urbanization; affordable access to clean energy; health and nutrition; economic empowerment of women; access to quality education; and water and sanitation.

April

On 20 April 2017, Mr René Van Berkel spoke at the Resource Efficiency Policy Dialogue, organized for the Indian Resources Panel (InRP) on opportunities and constraints for scaling up industrial resource efficiency, in particular in small and medium industries. At the launch of the 2017 Manufacturing Barometer, on 25 April 2017, by the Federation of Indian Chambers of Commerce and Industry (FICCI), he spoke on opportunities and challenges of the fourth industrial revolution.

May

UNIDO partnered with the Confederation of Indian Industries (CII) Centre of Excellence in SME Competitiveness for the first Energy Efficiency Circle on 18-19 May, 2017. The participating companies competed for awards based on their energy efficiency initiatives and achievements.

June

Mr René Van Berkel, UNIDO Representative, delivered an inaugural address for the 6th GreenCo Summit on 22-23 June 2017 in Pune, organized by the CII-Godrej Green Business Centre. GreenCo is the leading international example of an industry-led environmental rating scheme that encourages and supports enterprises to implement Resource Efficient and Cleaner Production (RECP) practices and technologies for competitive advantage.

He also spoke on the theme of productivity, innovation and sustainability during the MSME Summit organized by the Government of Andhra Pradesh on World SME Day (27 June 2017) in Vijayawada.
July

On 1 July 2017, Mr Van Berkel delivered a keynote presentation on water-efficiency and innovation for waterless textile processing during Textile 2017 in Gandhinagar, organized by the Ministry of Textiles. He joined Hon Smriti Zubin Irani, Minister of Textiles, to launch the publication of “Textile Parks of India: creating sustainable value chains”.

On 14 July 2017, he spoke on the business agenda for SDG9, during the State SDG Consultation in Hyderabad, organized by the Government of Telangana and the United Nations Country Team.

August

UNIDO joined the United Nations Country team to support the India ASEAN Youth Summit, on 15-16 August 2017 in Bhopal, during which the UNIDO Representative moderated sessions on SDGs in action.

September

During the Agriculture Leadership Summit, organized by the Indian Council on Agriculture and Food (ICAF) in New Delhi on 5-6 September 2017, Mr Van Berkel joined the panel on international cooperation for agriculture development.

At the Energy Efficiency, Environment and Technology Conference organized by CII - Centre of Excellence in SME Competitiveness on 14-15 September 2017, he moderated the plenary session on Energy Efficiency in Buildings.


He also provided plenary address to the 12th National Quality Conclave, organized by Quality Council of India on 21 September 2017 in New Delhi, during which he linked the concept of quality with the aims and objectives of inclusive and sustainable industrial development.

At the 2017 Stakeholders’ Forum of the Sustainable Cement Initiative, hosted by the Business Council for Sustainable Development India, on 26 September 2017 in Gurgaon, he provided a keynote presentation “SDGs: setting the challenge for business”.

Mr Van Berkel at the 6th GreenCo Summit

At the Stakeholders’ Forum of Cement Sustainability Initiative
He also contributed as panelist on secondary use of resources in industry, during the workshop organized by the European India Resources Initiative (EIRI) at the IFAT Industry Exhibition on Water and Sanitation in Mumbai on 28 September 2017.

**October**

UNIDO contributed to India’s 5th Water Week organized by the Ministry of Water Resources during 11-14 October 2017 in New Delhi, where Mr Van Berkel shared UNIDO experiences and perspectives during the thematic panels on: industrial water use and reuse; and smart cities.

During 31 October – 1 November, 2017, UNIDO contributed in parallel to the National Energy Efficiency Summit for Micro, Small and Medium Enterprises (organized with the Bureau of Energy Efficiency (BEE), The Energy and Resources Institute (TERI) and Swiss Development Cooperation (SDC) and 2nd Meeting of the Global Platform for Sustainable Cities (organized with the World Bank and Global Environment Facility).

**November**

UNIDO organized and hosted three consultations of stakeholders and government for the formulation of 2018-2022 UNIDO-India Country Programming Framework (7, 9 and 14 November).

Moreover, Mr Van Berkel presented keynote addresses during the Eastern Region Green Industry Conclave (organized by Confederation of Indian Industries in Kolkata on 8 November, 2017), during the 4th India Sustainability Standards Forum (organized by the Centre for Responsible Business in Delhi on 15-17 November 2017) and during the Resource Resilience Conference (organized by the India National Association for the Club of Rome in Mumbai on 17 November 2017).

**December**

UNIDO contributed to the 3rd Technology Summit (on 8-9 December 2017 in Pune) of the Automotive Components Manufacturing Association (ACMA) during which Mr Rene Van Berkel served as panelist in session on preparedness and roadmap for Industry 4.0.
2. India country programme

The present annual report is limited to activities and achievements of UNIDO projects and engagements in India. These are part of the UNIDO India Country Programme 2013-2017. After the 2015 amendment of the CP, the CP comprised of 48 project concepts with an indicative budget of USD170 million. Twenty-four projects (including several with subsequent stages and/or combining earlier separate project concepts) were operationalized in India, with a total budget of USD96 million (including Programme Support Cost, PSC), provided by the Global Environment Facility (GEF) (80.2%), the Government of India (GoI) (15.6%), the Government of Japan (GoJ) (3.0%) and UN resources (0.3%). Over the 5-year period the total UNIDO expenditures mounted up to USD 35,271,692 (incl. PSC). The three projects dealing with Persistent Organic Pollutants (POPs) accounted for 49% of expenditures during 2013-2017 (respectively PCB, DDT and medical waste projects). On the ground implementation peaked in 2017 at USD10.45 million.

Under promotion of green industrial development, UNIDO has been working on industrial energy efficiency, application of renewable energy in industry, clean technology innovation, and environmentally sound management of chemicals and wastes, with a total budget of USD83.234 million (inc. PSC). Under inclusive economic development, UNIDO has been working on productivity, lean manufacturing and appropriate technologies, with a total budget of USD12.766 million (inc. PSC), including through the activities of the joint UNIDO-DIPP International Centre for Inclusive and Sustainable Industrial Development (IC-ISID).

<table>
<thead>
<tr>
<th>Year</th>
<th>Inclusive Economic Development</th>
<th>Green Industrial Development</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>$15,47,949</td>
<td>$3702941</td>
<td>$52,90,387</td>
</tr>
<tr>
<td>2014</td>
<td>$5,72,465</td>
<td>$38,97,429</td>
<td>$44,70,429</td>
</tr>
<tr>
<td>2015</td>
<td>$3,85,156</td>
<td>$69,80,573</td>
<td>$73,65,729</td>
</tr>
<tr>
<td>2016</td>
<td>$16,23,172</td>
<td>$61,21,337</td>
<td>$77,44,509</td>
</tr>
<tr>
<td>2017</td>
<td>$23,23,102</td>
<td>$81,17,569</td>
<td>$104,40,671</td>
</tr>
</tbody>
</table>

Annual expenditures by UNIDO in India (inclusive of Project Support Costs)
<table>
<thead>
<tr>
<th>Title</th>
<th>Project Origin (***)</th>
<th>Component (****)</th>
<th>Total (incl PSC)</th>
<th>Implementation during 2013-2017</th>
<th>Remaining Implementation (2018 onward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmentally sound management and final disposal of PCBs in India</td>
<td>08-12</td>
<td>1</td>
<td>$15,510,000</td>
<td>$8,373,477</td>
<td>$1,784,525</td>
</tr>
<tr>
<td>Environmentally sound management of medical wastes in India</td>
<td>08-12</td>
<td>1</td>
<td>$11,000,000</td>
<td>$7,495,378</td>
<td>$3,371,785</td>
</tr>
<tr>
<td>Development and promotion of non-POP alternatives to DDT</td>
<td>08-12</td>
<td>1</td>
<td>$9,364,850</td>
<td>$1,537,271</td>
<td>$7,827,579</td>
</tr>
<tr>
<td>Promoting energy efficiency and renewable energy in selected micro, small and medium enterprises (MSME) clusters in India</td>
<td>08-12</td>
<td>1</td>
<td>$8,018,289</td>
<td>$2,116,350</td>
<td>$897,361</td>
</tr>
<tr>
<td>Promoting market transformation for energy efficiency in Micro, Small and Medium Enterprises</td>
<td>08-12</td>
<td>1</td>
<td>$4,992,001</td>
<td>$1,745,610</td>
<td>$3,246,391</td>
</tr>
<tr>
<td>Promoting business models for increasing penetration and scaling up of solar energy in India</td>
<td>08-12</td>
<td>1</td>
<td>$4,889,691</td>
<td>$3,255,479</td>
<td>$1,581,833</td>
</tr>
<tr>
<td>Organic waste streams for industrial renewable energy applications in India</td>
<td>08-12</td>
<td>1</td>
<td>$3,754,264</td>
<td>$447,157</td>
<td>$3,307,107</td>
</tr>
<tr>
<td>Promoting ultra low-head micro hydropower technology to increase access to renewable energy for productive uses in rural India</td>
<td>08-12</td>
<td>1</td>
<td>$1,397,945</td>
<td>$1,396,954</td>
<td>n/a</td>
</tr>
<tr>
<td>GEF UNIDO Cleantech programme for SMEs in India</td>
<td>08-12</td>
<td>1</td>
<td>$1,100,000</td>
<td>$1,052,323</td>
<td>$47,677</td>
</tr>
<tr>
<td>Sustainable cities, integrated approach pilot in India</td>
<td>13-17</td>
<td>1</td>
<td>$13,623,853</td>
<td>$718,108</td>
<td>$12,905,745</td>
</tr>
<tr>
<td>Facility for Low Carbon Technology Deployment</td>
<td>13-17</td>
<td>1</td>
<td>$9,583,561</td>
<td>$681,741</td>
<td>$8,901,820</td>
</tr>
<tr>
<td>Operational Phase of the International Centre for Advancement of Manufacturing Technology</td>
<td>08-12</td>
<td>2</td>
<td>$2,085,301</td>
<td>$616,904</td>
<td>n/a</td>
</tr>
<tr>
<td>Upgradation of Machine Tools Industry in India</td>
<td>08-12</td>
<td>2</td>
<td>$1,133,872</td>
<td>$188,512</td>
<td>n/a</td>
</tr>
<tr>
<td>Plastics Manufacturing Industry in India</td>
<td>08-12</td>
<td>2</td>
<td>$775,592</td>
<td>$355,327</td>
<td>n/a</td>
</tr>
<tr>
<td>Technology Upgradation and Productivity Enhancement of the Foundry Industry in Coimbatore</td>
<td>08-12</td>
<td>2</td>
<td>$708,429</td>
<td>$601,919</td>
<td>n/a</td>
</tr>
<tr>
<td>National Programme for Technology Upgradation of Brass and Bell Metal Industry / Artisan Enterprises in Khagra and other</td>
<td>08-12</td>
<td>2</td>
<td>$134,547</td>
<td>$56,304</td>
<td>n/a</td>
</tr>
<tr>
<td>Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts</td>
<td>13-17</td>
<td>2</td>
<td>$1,842,465</td>
<td>$507,163</td>
<td>$1,335,302</td>
</tr>
<tr>
<td>Development and adoption of appropriate technologies for enhancing productivity in the paper and pulp sector</td>
<td>13-17</td>
<td>2</td>
<td>$1,644,150</td>
<td>$964,357</td>
<td>$679,793</td>
</tr>
</tbody>
</table>
In 2017, UNIDO started implementation of two new projects, respectively:

- Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts industry, funded by the DIPP and implemented through the IC-ISID with project budget of USD1,842,465
- Sustainable Cities Integrated Approach Pilot in India, funded by the GEF and implemented in cooperation with MoHUA with project budget of USD 12,905,745

In addition, UNIDO started preparatory assistance on bamboo value chain development for diversified products and feedstocks, following the signature of a Memorandum of Understanding with Numaligarh Refinery Limited (NRL) on 13 September 2017 in the context of its planned construction of a bamboo-based bio-ethanol plant.

In parallel UNIDO completed during 2017 the implementation of two South-South Industrial Cooperation projects through IC-ISID, respectively:

- Promotion of neem derived bio-pesticides in West Africa (project budget USD275,000), funded by DIPP and implemented in parallel in Ghana, Nigeria and Sierra Leone;
- Strengthening the technical service capabilities of the Kenya Industrial Research and Development Institute (KIRDI) (project budget USD200,000), funded by DIPP and implemented in Kenya.

UNIDO developed the draft for the successor to the CP 2013-2017, the UNIDO India Country Programming Framework (CPF) 2018-2022, upon extensive consultation of government and stakeholders during November 2017 (as further elaborated in section 4).

---

Projects in bold are continuing at least in first quarter of 2018.
3. Project summaries 2017

UNIDO’s project activities in India covered during 2017 the two broad components of the 2013-2017 Country Programme: Inclusive Economic Development and Green Industrial Development. The project portfolio also covered crosscutting issues like South-South cooperation and gender mainstreaming. The majority of UNIDO’s interventions in India concern with energy and environment, within context of green industrial development. UNIDO addresses various dimensions of industrial energy use such as renewable energy, energy efficiency, low carbon technology, waste to energy and innovation. Similarly, the environment related projects involve environmentally sound management and final disposal of Poly Chlorinated Biphenyls (PCBs), medical waste disposal and the development and promotion of safe alternatives to DDT.

UNIDO zoomed in on supporting Micro-, Small- and Medium Enterprises (MSMEs) particularly in the manufacturing sector, through technical assistance, technology transfer, expertise best practice sharing, technology customization and demonstration and fostering entrepreneurship, in sectors as diverse as pulp and paper, cement, leather, bicycle and automotive components. These MSME initiatives are implemented through clusters, regional groupings of MSMEs operating in similar industry sectors. Over the course of 2017, UNIDO established and maintained active partnerships with up to 30 clusters covering 17 States and Delhi NCR. Capacity building of local experts and service providers has been a common feature to contribute to improving the ecosystem for MSME development within the country.

UNIDO executes its projects in close cooperation with different line ministries. The Department of Industrial Policy and Promotion (DIPP) under the ministry of Commerce and Industry is nodal agency for

GOVERNMENT PARTNERS (\textsuperscript{2})

\begin{itemize}
  \item UNIDO
  \item DIPP (6)
  \item MoEFCC (3)
  \item MoHUA (1)
  \item MNRE (2)
  \item MoMSME (2)
  \item DHI (1)
  \item BEE (2)
\end{itemize}

\textsuperscript{2} Numbers in brackets refer to active number of UNIDO projects for which respective government agency is responsible.
UNIDO in India. DIPP was also line ministry for six nationally-funded UNIDO projects, whereas DHI was line ministry for one nationally funded project. The other 10 projects were all funded by GEF, and are executed in partnership with different line ministries, respectively MoEFCC (3 projects), BEE, MNRE, M/oMSME (each 2 projects) and MoHUA (1 project). The figure shows key line ministries from the Govt. of India with whom UNIDO currently implements projects (number of projects in brackets).

UNIDO formulates and implements its projects in India in close partnership with multiple stakeholders including industry associations and business membership organizations, technical and academic institutes, (development) banks, and civil society networks. The figure below depicts several of closest collaborations.

The following sections contain project-wise summaries of activities and achievements during 2017.
MoEFCC (GoI) selected environmentally sound management and disposal of PCBs as one of the first priorities under the 2009 National Implementation Programme for the Stockholm Convention on Persistent Organic Pollutants (POPs). The present project is therefore aimed to dispose of at least 7,700 tonnes of PCBs, PCB-containing equipment, PCBs-containing mineral oil and wastes and thereby create national capacity to manage and dispose of PCBs countrywide.

The immediate objectives of the project are to:

- Strengthen the legal and regulatory framework for environmentally sound management (ESM) and disposal of PCBs, PCB-containing equipment and PCB-containing mineral oils and wastes.
- Improve institutional capacity at all levels for management of PCBs collection, treatment and disposal.
- Removal of 7,700 tonnes of PCBs, PCB-containing equipment and PCB-containing mineral oils and wastes from targeted sites and transport them to disposal unit for treatment and environmentally sound disposal.

The objectives are being achieved through a combination of strategies, including legislative and regulatory assessment, capacity building, public education, technology transfer, technology dissemination, technical training and technical support.

**Achievements**

- PCBs inventory revalidated and updated with additional 400 tons of pure PCBs and 600 tonnes of low concentration PCBs containing oil.
- The project awarded three contracts for disposing at least 7700 tonnes of PCBs namely through:
- Plasma Destruction Unit (from M/s Toxfree, Australia through M/s Ramky Enviro) for the static facility for the destruction of 1700 tonnes of pure PCBs);

- Dechlorination Plant (from M/s Kinectrics Canada through M/s Ramky Enviro) of the static facility for the dichlorination of 3400 tonnes of PCB contaminated oil, equipment & wastes; and

- Mobile de-chlorination facility (from M/s NPO Dekanter Russia) for treatment of transformer mineral oil containing PCBs (750 tonnes).

- Static facilities: the civil construction work and the commissioning of the static plants (both dechlorination and Plascon system) are being undertaken concurrently to save on time. Civil construction work of the static plants had been completed for 80% during 2017. Inspection of the equipment for static dechlorination plant had been undertaken.

- Mobile dechlorination plant with its support sodium dispersion (SDS) plant has been assembled/installed and commissioned, and steady state operation of mobile dechlorination plant and SDS plant achieved. Training of operators for mobile dechlorination plant and SDS plant completed.
Brief description

India produces some 330,000 tonnes of health care waste annually, which in the absence of segregation at source, is all considered hazardous despite the fact that only 5 to 10 per cent is actually hazardous and/or infectious in nature. The project therefore aims to reduce and ultimately eliminate the releases of unintentionally produced persistent organic pollutants (POPs) and other globally harmful pollutants into the environment from medical waste incineration, which will assist India in implementing its obligations under the Stockholm Convention. The project promotes country-wide adoption of Best Available Techniques (BATs)/ Best Environmental Practices (BEPs) in health care institutions with different complexity and size. It also assists to set up medical waste management infrastructure and industry in a manner that reduces adverse environmental impacts and protects human health.

The project seeks to harmonize waste generators (Health Care Facilities, HCFs) and waste processors (Common Biomedical Waste Treatment Facilities, CBWTFs) with each taking shared responsibility for environmentally sound management of medical waste in cost-efficient manner whilst also reducing infection risks. The project design incorporated findings from baseline survey of 57 CBWTFs (40% of operational CBWTFs in the country at the time) and detailed assessments in five selected states: Gujarat, Karnataka, Maharashtra, Punjab and Odisha.

The project demonstrates a comprehensive strategy based on waste prevention and segregation through training and skilling, safe collection of source segregated medical wastes in color coded bins, local disinfection of infectious waste (using micro-waves) and improved operation of CBWTFs for remaining medical waste.

Achievements

Building on previous years’ achievements, during 2017 the project achieved:

- Technical and commercial evaluation of the global bids for the procurement of commercial scale microwaves completed and order placed with the vendor.
- Pre-delivery inspection and supply of color-coded bins and waste collection trolleys completed in Gujarat, Karnataka, Maharashtra and Punjab.
• Launching of Model District Component of the project in Nashik, Maharashtra on 8 December 2017.

• A total of 3624 medical personnel has been trained during 142 trainings conducted across five beneficiary states.

• End to end survey of CBWTFs by National Environmental Engineering Research Institute (NEERI) has been carried out in model districts of Mysuru (Karnataka), Nashik (Maharashtra) and Gandhinagar (Gujarat).

• Standard Operating Procedures (SOPs) developed for efficient medical waste management.

• Training manuals prepared for trainers, administrators, doctors, nurses, paramedical staff and waste handlers, including:
  a) Trainers Guide;
  b) Information Handbook for Administrators;
  c) Training Manual for Doctors/Nurses/Waste Managers;
  d) Training Manual for Waste Handlers.

TRAININGS OF DOCTORS, NURSES AND PARAMEDICAL STAFF IN KARNATAKA

Impressions from training sessions on biomedical waste management
India is the only country that still continues to produce and export DDT. As a result of continued use of DDT in India and Africa, the mosquitoes have developed resistance and the recommended doses of DDT no longer remain effective to combat the mosquitoes menace. There is an urgent need to develop a phase-out strategy for DDT in India.

The project adopted holistic and country-wide approach to develop viable alternatives for protection against malaria and other mosquito-born disease. The Ministry of Environment, Forests and Climate Change (MoEF&CC), Ministry of Health and Family Welfare, (MoHFW) and Ministry of Chemicals and Fertilizers (MoCF) ensure that new policy and legislative framework are prepared in time taking into account the overall interest of the country.

Despite the efforts under the National Vector Born Disease Control (NVBDC) programme, about 1.5 million cases of malaria remain annually. The present project attempts to combat the mosquitoes at different critically weak points in their life cyycle through the introduction of Bt-based biopesticides and neem-based botanical pesticides and further reinforcing with Long Lasting Insecticidal Nets (LLIN) with synthetic pyrethroids as the final barrier. Through this three pronged approach, the mosquitoes in its larval stage would be controlled through application of Bt-based and neem based biopesticides which are very effective to kill the larvae but safe to other aquatic animals and human beings. Any escape of larvae from the Bt and neem targetted environments resulting in becoming adult would be checked through the use of LLIN barrier.

**Achievements**

Continuing from the project launch and start up activities during 2016, the project achieved steady progress during 2017 in regard to:

- Institute for Pesticides Formulation Technology (IPFT) has been contracted to scale up different neem-based and Bt based pesticide formulations including provision of technical training in formulation processes. This includes amongst others neem-based floating tablets and coils.
- National Botanical Research Institute (NBRI) has been contracted for scaling
up production of neem based botanical pesticides in Public Private Partnership, establishment of Bt based bio-pesticides pilot production facility, development of business model for alternative products, awareness raising on the use and application of alternatives and promotion and propagation of new dwarf cultivars with early maturity and higher limonoids yield though tissue culture technology and other means.

- The production of Long Lasting Insecticidal Nets (LLIN) is being contracted to Hindustan Industries Limited (HIL) using the technology developed by Central Institute for Plastic and Engineering Technology (CIPET). UNIDO is finalizing a contract with HIL for the putting up a commercial production facility for the manufacture of LLIN. The plant would manufacture 5 million nets per annum.
**Brief description**

The project works to develop and promote energy efficiency solutions and enhanced use of renewable energy technologies for process applications in 12 selected energy-intensive MSME clusters in India with possible expansion to more clusters thereafter. Thereby, the project improves the productivity and competitiveness of units in the five target sectors, namely: brass; ceramic; dairy; foundry; and hand tools, as well as reduces greenhouse gas emissions and improves the local environment. The project involves a combination of approaches to achieve this objective: including demonstration projects; capacity building and training; exposure visits and study tours; and, based thereon, policy support and advisory.

The project is working in 12 clusters across the country. In the clusters the project has established collaboration with local industry associations, who anchor the activities on the ground. It also works with local service providers and technology suppliers and the individual units themselves. The project looks at energy efficient alternatives and renewable energy to control/reduce CO₂ emissions and overall impact on the environment. It targets a total energy saving of 276,600 MWh annually and avoidance of 84,700 tonnes of carbon emissions per year by project end. It also aims to achieve an investment of US$ 16million in energy efficiency and renewable energy technologies.

During 2017, the project continued to work in five (5) sectors across ten (10) clusters in India. These are:

<table>
<thead>
<tr>
<th>Sector</th>
<th>Clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass</td>
<td>Jamnagar in Gujarat</td>
</tr>
<tr>
<td>Ceramics</td>
<td>Khurja in Uttar Pradesh and Thangadh in Gujarat</td>
</tr>
<tr>
<td>Dairy</td>
<td>Gujarat and Sikkim</td>
</tr>
<tr>
<td>Foundry</td>
<td>Belgaum in Karnataka, Coimbatore in Tamil Nadu and Indore in Madhya Pradesh</td>
</tr>
<tr>
<td>Handtools</td>
<td>Jalandhar in Punjab and Nagaur in Rajasthan</td>
</tr>
</tbody>
</table>

Moreover, preparatory activities were undertaken in Morbi (ceramics) and Kerala (diary) to start cluster level activities in early 2018.

**Achievements**

Building on past years experiences and achievements, during 2017 project continued with:
UNIDO OPERATIONS IN INDIA

• Organization of 2-day national summit on “Energy Efficiency in Micro, Small and Medium Enterprises (MSMEs)” from 31st October – 01st November 2017. During this Summit, the project launched introductory videos (in English and Hindi) and formally inaugurated Energy Management Cells (EMCs) for nine clusters.

• Organized inter-cluster visit for Indore foundry cluster to Belgaum foundry cluster.

• Participation as exhibitor in Vibrant Ceramics Expo at Ahmedabad, Gujarat, during which various energy monitoring instruments of EMCs were exhibited.

• Expanded and strengthened the project’s implementation capacity through appointment of cluster leaders for Morbi and Khurja clusters, contracting of CII and TERI for capacity building of local service providers and empanelment of agencies for cluster activities in dairy and ceramics sectors.

• Organized no-cost 3-days residential capacity building-cum-training workshop for Cluster Leaders and Cluster industry representatives on “Basic Energy audit skills and handling of Energy audit Instruments” at National Productivity Council, Chennai, and awarded NPC for organizing 12 cluster-specific workshops on “Best Operating Procedures for Energy Management in MSMEs”.

• Conducted 6th project steering committee meeting.

• Organized several knowledge dissemination workshops in the clusters and trained more than 200 MSME members and employees.

• Prepared further energy efficiency demonstrations, through request for proposals, development of 40 DPRs and shortlisting 22 technologies for part grant funding under project.

• Preparation of 100 case studies to showcase the results achieved through various energy efficient technologies and practices.

• Facilitation of tripartite agreement signed with Belgaum Foundry Cluster for demo project on sand reclamation plant.

As an outcome of its activities, the project had at the end of 2017 achieved 7161 tonne of oil equivalent annual energy saving enabling ₹ 3156 Lakh monetary benefit/year. This has also resulted in 40630 tonnes less anthropogenic carbon emissions into atmosphere. All this has been achieved with an investment of ₹ 3102 Lakh from the MSMEs which reflects their interest towards energy efficiency.
**Brief description**

The project aims to scale up the implementation of energy efficiency in the MSME sector in a market-oriented fashion. It works to standardize energy-efficient technologies by sector and to ease access to financing for such standardized solutions, through a revolving fund that ensures replication of energy efficiency measures in the sector. Thereby the project addresses key technical and financial barriers previously identified towards scaling-up energy efficiency. Ultimately, this will promote a cleaner and more competitive MSME manufacturing sector in India.

The project has four main components:

- **Identification of energy intensive clusters and replicable technologies** - select at least 6-8 energy intensive clusters and therein a set of replicable energy efficient technologies that maximize energy savings at cluster level.
- **Demonstration projects and aggregation of demand for demonstrated technologies** in the clusters - execute demonstration projects with identified technologies to create awareness and capacity, demonstrate energy, productivity and economic benefits, and trigger energy efficiency investments.
- **Establish financing models for replication of energy efficient technologies in MSMEs** - develop and promote financing scheme, based on revolving fund, to replicate and scale up investments in demonstrated energy efficient technologies.
- **Monitoring and Evaluation** - establish and operate monitoring and evaluation function and indicators to facilitate successful project implementation and sound impact assessment.

**Achievements**

The project activities were initiated from late 2016 and continued in 2017 with:

- Preliminary identification of 10 clusters (see map).
- Organized kick off workshop in Odisha and prepare baseline video.
- Initial technology scoping conducted in 6 clusters, namely: Odisha (sponge iron); Jorhat (tea); Vellore (rice milling); Surat (textile); and Vapi (chemicals). Follow up brainstorming workshop were held at Surat, Vapi, Ludhiana, Jalandhar, Odisha, Jodhpur and Jorhat clusters.

---

**PROMOTING MARKET TRANSFORMATIONS FOR ENERGY EFFICIENCY IN MICRO, SMALL AND MEDIUM ENTERPRISES**

<table>
<thead>
<tr>
<th>Budget</th>
<th>US$4,460,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-financing</td>
<td>US$26,860,000</td>
</tr>
<tr>
<td>Donor</td>
<td>GEF</td>
</tr>
<tr>
<td>Duration</td>
<td>60 months</td>
</tr>
<tr>
<td>Status</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

**Partners**

- Ministry of Micro, Small and Medium Enterprises (MoMSME)
- Energy Efficiency Services Limited (EESL)
- Small Industries Development Bank of India (SIDBI)
- Bureau of Energy Efficiency (BEE), Ministry of Power

**Locations**

Gujarat, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh
• Investigation of the potential technology for the Jodhpur limekiln cluster.

• Second ‘Project Steering Committee (PSC)’ meeting was held in the month of February 2017.

• Energy Efficiency Services Limited was officially contracted as the main execution partner responsible for technical support and design and operation of the financing mechanism (signed on 18th October 2017).

• Assessment of potential industrial clusters in the States of Meghalaya and Uttarakhand was undertaken during December 2017.
ANNUAL REPORT 2017

Brief description

The goal of the project was to increase access of rural communities to renewable electricity in the State of Uttarakhand, India. The project included demonstration, deployment and transfer of Ultra-Low Head (ULH) Micro Hydro Power (MHP) technology from Japan to the State of Uttarakhand. The project designed and demonstrated three pilot mini-grid systems that could power productive activities based on 10kW ULH-MHP units, using existing infrastructure such as service water canals and irrigation canals.

The outputs of the project were as follows:

• ULH-MHP (Ultra Low Head Micro Hydro Power) systems installed and operational
• Advisory support to create a favorable environment for ULH-MHP technology deployment

Achievements

The project had been operationally completed and evaluated during 2016. During 2017, UNIDO continued to provide ad hoc support to the beneficiary communities to ensure continued and efficient operation of the installed ULH MHP systems and associated mini-grids. The 2016 evaluation had confirmed the following achievements:

• 1x ULH MHP system successfully deployed and 70,080 kWh generated (INR 308,352, about USD4,800 of income) in 2013, system handed over.
• 1x ULH MHP system successfully deployed, generated about 30,000 kWh (estimated values) at site-3, community used electricity for processing of spices and marketing local agricultural produce to market for livelihood.
• 2x ULH MPH installed system are operated and maintained by local operators, Operation & Maintenance training provided.
• Over 250 people visited the 1st demonstration site (IRI Bahaderabad) and 150 visitors to 2nd and 3rd demonstration sites (Ambadi & Roorkee Watermill).
• At Kaladhungi, infrastructure developed, agricultural processing assets developed,
community started processing agricultural produce and marketing since Aug 2015.

- At Ambadi, infrastructure developed, processing assets procured, community group trained on Operation and Maintenance (O&M) and marketing of processed agricultural produce.

- ULH-MHP technology is included in the Policy Guidelines of the central government policy (Ministry of New and Renewable Energy (MNRE)). MNRE has made a provision of Central Financial Assistance of INR 125,000 (about USD 2000)/kW for micro hydro projects and have now included ULH-MHP.


- Locally manufactured system installed and tested in the project sites and adaptation measures have been taken. Control panel fully manufactured locally. After-service can be made by local private sector. The generator and gear box were imported under the present project.

- The technology provider invested for local manufacturing of the system and deployment with local partners.

- The central and state governments financed various enabling activities for ULH-MHP systems such as master plan survey (co-financed by MNRE), international conference and workshop.

- Irrigation Department has been actively involved. Project established and strengthened a cross-cutting cooperation on renewable energy application particularly canal-based system with state agencies for energy and irrigation.

**Key learnings and recommendations**

- For future projects that have a technology transfer component, UNIDO could identify at the design stage of the project the local manufacturers and technology service providers (such as O&M companies) to whom the technology would be transferred in order to ensure maximum absorption capacity and post project replication in the country.

- The duration of the project of this nature (technology transfer, installation and successful demonstration) should be longer and hence UNIDO and the donor agencies should keep that into account while designing such projects.

- In order to keep the momentum and fully realize the outcome of successful demonstration to ensure uptake, it is recommended that additional activities are carried out including more pilot projects with locally manufactured equipment.

- UNIDO can further emphasis on preparing and following a more systematic Monitoring and Evaluation (M&E) process such as preparing M&E plans and explicitly allocating budgets for systematic monitoring.

- Additional policies, particularly by the State government, to promote ULH-MHP and other kinds of small hydropower systems will be beneficial to ensure sustainability of developmental efforts through such pilots targeted at Rural Development.
Brief description

The project focuses on developing business models for promoting solar energy-based heating and cooling applications in selected industrial sectors in line with the priorities outlined in the National Action Plan on Climate Change (NAPCC) and the Jawaharlal Nehru National Solar Mission (JNNSM). This reduces greenhouse gas (GHG) emissions and increases industrial competitiveness. The project targets in particular the scaling up of Concentrating Solar Thermal (CST) technologies, that use system of collectors to achieve low to mid-range temperatures, up to around 400°C.

The project is structured towards:

- Enhanced penetration and scaling up of solar energy in medium temperature applications in identified industrial sectors building upon existing frameworks and central support instruments of MNRE.

- Demonstrated technical and financial viability of solar thermal projects with enhanced local manufacturing capability for industrial applications.

- Developed pipeline for replication of CST applications including through assistance to similar projects in the country through financing facility, quality assurance and certification.

Achievements

Continuing from prior years’ achievements during 2017, the project achieved:

- A new innovative financing scheme was launched in partnership of Indian Renewable Energy Development Agency (IREDA) and MNRE to promote CST technologies for process heat applications in industries. The details of the loan scheme are available on IREDA’s website http://www.ireda.gov.in/forms/contentpage.aspx?lid=740. The scheme supports the beneficiaries by bundling the MNRE’s subsidy and the soft loan, thereby providing upfront access to 75% of CST project cost.

- The project created provision for supporting the manufacturing of CST technologies. Soft loan with 5% interest subvention would be extended to recognized manufacturers and channel partners of CST for supporting innovation in manufacturing of CST technology and its components.

- To facilitate industrial applications the project provides technical assistance to CST beneficiaries and suppliers to enable novel applications of CST technologies such as their use for waste-water treatment, crematoriums and cold storages. To this effect the project identified priority
applications in following sectors: textiles; pharmaceuticals; tobacco; breweries; pulp and paper; electroplating; rubber; chemicals and fertilizers; petroleum refineries; desalination; ceramics and related industries; and for hot water/steam generation. A further CST roadmap has been developed and was at end of 2017 awaiting final approval for publication.

- Awareness workshop and site visits were undertaken in Ludhiana in September 2017.
- National Institute of Solar Energy (NISE) has been engaged to conduct nationwide capacity building activities for both designing and installing of CST systems along with their operation and maintenance.
- To identify and address the requirements of enhancing the manufacturing in the country from the current levels, a session was organized on “Manufacturing of CST” during Renewable Energy India Expo 2017 on 20 September 2017.
- An independent Mid-Term Review (MTR) was undertaken for the project in November 2017.
- The project has been making efforts to demonstrate feasibility of CST technologies for energy and carbon emission savings in the cold storages, tea sector and oil and natural gas sectors.
ORGANIC WASTE STREAMS FOR INDUSTRIAL RENEWABLE ENERGY APPLICATIONS IN INDIA

Budget: US$3,333,000
Donor: GEF
Duration: 60 months
Status: ongoing

Partners:
- Global Environment Facility (GEF)
- Ministry of New and Renewable Energy (MNRE)
- Ministry of Micro, Small and Medium Enterprises (MSME)
- Small Industries Development Bank of India (SIDBI)

Brief description

The overall objective of the project is to support SMEs to reduce the dependence on fossil fuels by utilising organic waste streams for Industrial energy applications, in support of the energy policy priorities, with the overall aim to promote innovative technical and financial models for the conversion of organic waste streams to usable forms of energy through pilot/demonstration projects. The project has the following four components.

- **POLICY** - This component will strengthen the policies and regulatory framework to effectively promote and support SMEs to invest in organic waste to energy technology.

- **TECHNOLOGY DEMONSTRATION** - Through incentives for innovative biogas technologies will trigger investment in advanced bio-methanation projects to demonstrate their technical feasibility and commercial viability as well as complete tailored guidelines for SMEs. These will build the confidence of both industry and finance sector, create best practice examples to pave the way for replication in the scale-up component, thanks to experience gained, reduced (perceived) risk and increased capacity and awareness at multiple levels, i.e. industry (both at operational and decision-making level) and finance.

- **SCALE-UP** - This will then put in place a replication mechanism to mainstream the application of bio-methanation for SMEs by establishing a financing facility to reduce (perceived) risk, develop business models and adopt quality standards to further build trust in the technology.

- **CAPACITY BUILDING** - To strengthen the institutional capacity as well as address the insufficient technical capacity training, awareness and the development of knowledge products, in support of reducing (perceived) risk of both industry and finance sector; activities under this component should take off in parallel with component 2 on technology demonstration in order to jointly prepare for the scale up / mainstreaming phase in the second half of the project and beyond.

- **The expected outcomes of the project are as follows:**
  - Enhanced use of organic waste streams for industrial RE applications in target SME sectors through a strategic roadmap.
  - Demonstrated technical and financial viability of 2-4 projects in the range of 0.25-2 MW (or equivalent thermal energy).
  - Sustainable replication model for effective scaling up of different technologies across target industries.

Enhanced capacity of key players in target industries, promotion of knowledge and information sharing and dissemination of best practices.
**CLEANTECH PROGRAMME FOR SMES IN INDIA (GLOBAL CLEANTECH INNOVATION PROGRAMME)**

<table>
<thead>
<tr>
<th>Budget</th>
<th>US$1,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-financing</td>
<td>US$3,000,000</td>
</tr>
<tr>
<td>Donor</td>
<td>GEF</td>
</tr>
<tr>
<td>Duration</td>
<td>60 months</td>
</tr>
<tr>
<td>Status</td>
<td>Operationally completed (2017)</td>
</tr>
</tbody>
</table>

**Partners**
- Ministry of Micro, Small and Medium Enterprises (MoMSME)
- Federation of Indian Chambers of Commerce and Industry

**Locations**
- Pan India

**Brief description**

This project is part of UNIDO’s Global Cleantech Innovation Programme (GCIP) which aims to promote clean low carbon technologies to reduce energy consumption and CO₂ emissions of the Indian industrial sector. The project focuses on clean technology innovations suited for the manufacturing sector, coming specifically from existing MSMEs. This promotes technologies that are marketable and tested and facilitates the efficient performance of industrial sub-sectors. Such coverage not only reduces environmental impact, but also helps in alleviating energy poverty and maintaining industrial growth. The project focuses on SMEs that have innovated and can develop commercially viable, clean, low carbon technologies to reduce GHG emissions. The programme also gives SMEs international exposure by providing them a platform to compete globally. The winners of the national competition are given an opportunity to compete at the Global Cleantech Open in USA, which is the knowledge platform of UNIDO for this programme. The participants get to interact with mentors and SMEs from all over the world at the Global Forum.

**Achievements**

The project continued on the basis of prior years results with following highlights in 2017:

- Mr S.N. Tripathi, Additional Secretary & Development Commissioner (Ministry of MSME), joined the 2016 winners and runners up for the finale of the Cleantech Open Global Competition held in Silicon Valley on 10 February 2017. Mumbai's Atomberg Technologies won the energy efficiency category for its efficient DC fans, and Bengaluru's GIBSS received the top innovation award for its ground-breaking work on developing geothermal energy for building AC systems.

- Experience sharing workshop was held based on results of first three years implementation on 9 March 2017, at which stage a journal was published and short videos released with innovator profiles, https://www.youtube.com/playlist?list=PLju1yo1qHedWN-gmKN30vD-Ex8lpJtSyd.

- As part of exit strategy for the GCIP programme, UNIDO and Ministry of MSME agreed to build the capacity of the Institute for Design of Electrical Measuring Instruments (IDEMI) to implement the GCIP innovation program activities in 2017. IDEMI received guidance from the UNIDO Project Management Unit based in New Delhi on implementing various activities.
The innovation challenge was designed to cover four broad areas of Energy Efficiency, Renewable Energy, Water Efficiency and Waste Beneficiation, and announced on 23rd June, 2017. It was published in major newspapers and on the start-up database maintained by the Department of Industrial Policy and Promotion.

The challenge closed on 12th August by which time 233 applications were received and screening committee shortlisted 20 promising applicants with innovative clean technology.

13 volunteer mentors were selected from the energy sector to mentor the semi-finalists. The experience of the mentors ranged from entrepreneurs, consultants, venture capitalists, government officials and service providers.

A two-day National Academy was organized on August 2017 where 20 semifinalists and 13 mentors along with the US Cleantech Open team, a US based non-profit, participated for orientation of all the stakeholders.

Cleantech Open held a series of webinars during September and October 2017, in which the shortlisted participants received training on various topics related to starting a business around an innovation, developing a viable business model, and raising funds to sustain and grow the business. The international participation brought in focus the challenges in other countries also in the space which was a great learning for the teams.

Business Clinics were held in Mumbai on 2nd and 3rd November 2017 during which one-to-one interaction was organized between the participant and mentors. These sessions allowed each participant to interact with up to 7 mentors who provided practical advice on various practical matters related to startups such as the business model, communication strategy, protection of Intellectual Property, approach towards raising funds, identifying potential clients and plan to reaching out. The participants greatly appreciated the guidance and attention received from the mentors during business clinics.

The semi-finalists were judged on 7 December 2017 by subject experts leading to the top 7 teams, which then presented to four-member jury comprised of senior officials from government, industry and academia. Saathi Eco Innovation was the National Winner for its biodegradable sanitary napkins made from waste banana fibre and Chakr Innovations was declared as the National Runner up for its innovation to remove soot from diesel generator exhaust and produce therewith printing ink.
UNIDO Operations in India

Brief Description
The UNIDO GEF Facility for Low Carbon Technology Deployment in India aims to facilitate the adoption of low-carbon technologies across the Indian industrial sector, in particular for waste heat recovery, space conditioning and water (irrigation) pumping. The project aims at strengthening the collaboration between government agencies, industry, innovators, the research community, financing institutions, and technology experts in the field of innovative low-carbon technologies and establishing an innovation ecosystem for such technologies to thrive.

The Project is aligned with the goals of India's National Action Plan on Climate Change (NAPCC), and specifically, its sector specific National Mission on Enhanced Energy Efficiency (NMEEE). This Facility was proposed amongst a suite of projects to support India's NMEEE implementation by the Bureau of Energy Efficiency. It is expected to help Indian and other countries' entities to work collaboratively on solving the major prioritized climate mitigation technology challenges, guided by industry and academic experts.

Achievements
- An initial brainstorming meeting with stakeholders was organized back with the experience sharing workshop for the global cleantech innovation programme on 9th March 2017.
- The annual implementation plan was endorsed by the Director General, Bureau of Energy Efficiency (National Project Director) in April 2017 and activity began to launch the innovation challenge in the area of Waste Heat Recovery (WHR).
- The WHR expert panel was constituted with the approval of BEE and scope of innovation challenge was finalized after two rounds of deliberations by the members of expert panel.
- Confederation of Indian Industries (CII) was engaged by UNIDO for implementation support and reaching out to industries for deployment of winning innovative technologies and solutions. The project portal was developed for announcing the Innovation Challenge and for receiving applications, www.low-carbon-innovation.org.
- The 1st WHR Innovation Challenge was announced with the launch of FLCTD website on 1st November 2017 by the Secretary, Ministry of Power at the National Summit on Energy Efficiency in MSME’s, held in New Delhi.
- The publicity of Innovation Challenge was held using various medium such as newsletter, newspaper advertisement by BEE, outreach to various incubation centers in technical institutes.
• The Project Management Unit and CII jointly held four roadshows for outreach of WHR Innovation Challenges in Ahmedabad, Chennai, Pune and New Delhi in December 2017 and interacted with stakeholders from academia, industry, service providers, startups and encouraged them to submit applications.
SUSTAINABLE CITIES INTEGRATED APPROACH PILOT IN INDIA (SC-IAP CLIMATE CHANGE)

Budget | US$12,110,092
---|---
Co-financing | US$104,717,419
Donor | GEF
Duration | 60 months
Status | Operational

Partners
- Ministry of Housing and Urban Affairs (MoHUA)
- Municipal Corporations of Bhopal, Jaipur, Vijayawada, Guntur and Mysore
- UN Habitat

Locations
Bhopal, Jaipur, Vijayawada, Guntur and Mysore

Brief description
The project entails the Indian child-project under the global parent GEF project on Sustainable Cities, implemented in parallel by World Bank and UNIDO in cities in different developing countries, and supported by Global Platform for Sustainable Cities (managed by the World Bank, https://www.thegpsc.org/).

The Indian pilot project is implemented by UNIDO with inputs from UN Habitat and covers five pilot cities: Jaipur; Mysore; Vijayawada; Guntur; and Bhopal. These represent the diverse urban environment of India, owing to their geographical spread and differences in socio-economic development status. All pilot site locations have been selected in collaboration with the Municipal Corporations and taking into account integrated urban planning principles, as well as alignment of the demonstration pilots with the national and local priorities including sustainable city development. This project is aligned with Government of India’s programs on waste management, principally the Swachh Bharat (Clean India) Mission.

GPSC: Knowledge Platform
- Supporting integrated urban planning and financing
- Connecting cities
- Forging a shared vision for urban sustainability

Participating Cities

Stakeholders’ review meeting on GHG inventory in Vijayawada
The project aims to integrate sustainability strategies into urban planning and management to create a favorable environment for investment in infrastructure and service delivery, thus building the resilience of pilot cities. The general framework of the project is organized into four components:

- **Sustainable Urban Planning and Management** – integration of sustainability practices into urban plans to identify priority projects for improving sustainability and reducing GHG emissions.

- **Investment Projects and Technology Demonstration** – support for the identification and execution of investment projects demonstrating best environmental techniques provisionally for: landfill closure and management (Bhopal); energy generation from municipal solid waste (Jaipur); energy generation from sludge of sewage treatment plant (Vijayawada); and composting of municipal solid waste (Mysuru).

- **Partnership and Knowledge Platform** – sharing best practices in sustainability planning and management of cities, and promotion of sustainability focused investment projects in cities.

- **Monitoring and Evaluation** – with a particular focus on reduction of greenhouse gas emissions and improvement of city’s municipal services.

The project is expected to reduce cities’ greenhouse gas emissions (through investment projects and low-emission and environmentally sound technology demonstrations), to increase scope and depth of integrated urban sustainability management policies and processes, including institutionalization within the local governance structure; and facilitate partnerships for implementation of sustainable cities.

### Achievements

The project was approved by GEF in February 2017 and since then UNIDO has been working towards operationalization and implementation. Pending finalization of the execution and fund management agreements with the Government of India, only preliminary activities could be undertaken during 2017, in particular:

- UNIDO and MoHUA hosted two Partnership Workshops, in February and July 2017, to refine project objectives, activities and operational arrangements with the participating cities.

- A baseline GHG inventory has been completed for each city and results have been presented and reviewed with city level stakeholders, to verify data and assumptions and start building capacity for future GHG inventories.

*Stakeholder’s workshop in Mysuru*
• Field trips and site visits conducted in participating cities for finalizing a potential demonstration project in each city and discussing other possible opportunities.

• Supported the organization of the second annual meeting of Global Platform for Sustainable Cities (GPSC) on 31st October – 1st November 2017 at New Delhi, in which representatives of all five pilot cities participated.

Second Annual Meeting of the Global Platform for Sustainable Cities

Site Visit to Sewage Treatment Plant in Vijayawada
supporting small and medium-sized manufacturers in the automotive component industry in India: deepening and widening the services provided within the framework of the UNIDO-ACMA-DHI partnership programme

<table>
<thead>
<tr>
<th></th>
<th>UNIDO</th>
<th>ACMA</th>
<th>Co-financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget</td>
<td>US$909,674</td>
<td>US$1,165,715</td>
<td>US$1,131,086</td>
</tr>
<tr>
<td>Donor</td>
<td>DHI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>48 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>ongoing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Partners**
- Automotive Component Manufacturers Association

**Locations**
- Pan India

**Brief description**
This project succeeded the successful cooperation between UNIDO and ACMA during 2005-2009 with a view to take forward its interventions and to further strengthen Indian small and medium-sized automotive component manufacturers to meet the requirements of vehicle manufacturers and their first-tier suppliers. The project hinges on close collaboration between ACMA and UNIDO to bring SMEs in the auto component sector up to international standards and international market demands.

Inclusion of these SMEs into national, regional and global supply chains requires them to meet relevant supply chain requirements, in areas as diverse as quality, cost and delivery as well as Occupational Health & Safety (OHS), energy efficiency and environmental management. The project consolidated the institutional set-up, the UNIDO-ACMA methodology and a pool of well-trained national experts and counsellors in an effort to better assist auto component manufacturers in enhancing their competitiveness, including of lower tier suppliers.

**Achievements**
The current phase-I (2014-2017) of UNIDO-ACMA Partnership Programme has been operationally completed in December 2017:
- ACMA - UNIDO methodology delivered and implemented in 25 clusters (covering 152 companies) across various locations in India. Moreover, a satisfaction survey was undertaken among participants to ascertain levels of improvement achieved.
- Complementary training with International Labor Organization (ILO) on workplace cooperation delivered to counsellors and enterprises in Chennai cluster.
- Monitoring visits by DHI Secretary and Joint Secretary to Pune cluster companies.
- 152 companies which includes 25 clusters at 12 locations completed the programme successfully.
- 152 companies underwent customer satisfaction survey.
- Cluster companies at Pune location were visited by DHI secretary and Joint Secretary.
- Completion of innovation and supplier development surveys.
- Proposal for second phase developed to streamline and scale up the cluster programme to 275 new tier 2 and 3 manufacturers through dual delivery mode and increased focus on technology innovation and preparedness for Electric Vehicles and Industry 4.0.
• Preparations made for independent terminal evaluation, to be conducted in first quarter of 2018.

<table>
<thead>
<tr>
<th>Tangible Benefits</th>
<th>Parameters</th>
<th>Indicators</th>
<th>Improvements (Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manpower</td>
<td>Absenteeism</td>
<td>Permanent</td>
<td>31% Reduced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temporary</td>
<td>26% reduced</td>
</tr>
<tr>
<td>Safety</td>
<td>Unsafe Acts</td>
<td></td>
<td>61% reduced</td>
</tr>
<tr>
<td></td>
<td>Unsafe Conditions</td>
<td></td>
<td>68% reduced</td>
</tr>
<tr>
<td></td>
<td>Accidents (Major)</td>
<td></td>
<td>36% reduced</td>
</tr>
<tr>
<td>Material</td>
<td>Inventory</td>
<td>Inventory Time Ratio</td>
<td>65% improved</td>
</tr>
<tr>
<td>Machine</td>
<td>My Machine</td>
<td>Breakdown in Hours</td>
<td>39% reduced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In Process Rejection</td>
<td>51% reduced</td>
</tr>
<tr>
<td>Method</td>
<td>Quality</td>
<td>Customer Complaints</td>
<td>58% reduced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer Returns</td>
<td>57% reduced</td>
</tr>
<tr>
<td>SMED</td>
<td>Average Setup time</td>
<td></td>
<td>20% reduced</td>
</tr>
<tr>
<td>5S</td>
<td>18 Score</td>
<td></td>
<td>60% improved</td>
</tr>
<tr>
<td></td>
<td>2S Store</td>
<td></td>
<td>56% improved</td>
</tr>
<tr>
<td>Money</td>
<td>Delivery</td>
<td>Adherence to Schedule</td>
<td>11% Improved</td>
</tr>
<tr>
<td></td>
<td>Space Optimization</td>
<td>Average 120 Square feet</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>Net savings</td>
<td>Total Saving: 17.34 Crore</td>
<td>Improved</td>
</tr>
</tbody>
</table>

Summary of impact survey among participating companies

Summary of project intervention areas

Shopfloor impressions at participating enterprises
The joint DIPP-UNIDO International Centre for Inclusive and Sustainable Industrial Development (IC-ISID) works to facilitate inclusive and sustainable industrialization in India and other developing countries (through South-South and triangular cooperation). IC-ISID was inaugurated on 27 August, 2015 to:

- Promote introduction and adoption of advanced manufacturing technologies in the manufacturing sector in India to strengthen productivity and competitiveness of MSMEs;
- Identify and transfer best and proven technology-led solutions from India to other developing countries; and
- Serve as a model for promoting targeted interventions in select manufacturing sectors.

DIPP provides funding support for the operations of IC-ISID and the projects implemented under IC-ISID. The activities and achievements of IC-ISID are reviewed and coordinated through a joint steering committee of DIPP and UNIDO, with inputs from stakeholders in the target sectors.

**Achievements**

Building on previous years’ results, during 2017 IC-ISID:

- Hosted meetings of Steering Committee on 11 January and 24 October 2017, chaired by the Joint Secretary, DIPP.
- IC-ISID continued to support implementation of four projects in India focused on leather, cement, pulp and paper, and bicycle sectors in India. In addition, two South-South cooperation projects were operationally completed during 2017 in Kenya and in West Africa.
- IC-ISID established linkages with various international organizations, including R&D institutions, industry associations and promotional agencies towards identification of ISID-relevant projects for future implementation by IC-ISID, including in the areas of Industry 4.0; food processing industry; electronics systems design and manufacturing; (all focused on India) as well as for South-South cooperation in Africa and South Asia.
- IC-ISID contributed to awareness generation and advocacy for inclusive and sustainable industrialization, through participation in different events, such as: India Roundtable on Global Innovation Index (by NITI Aayog); Global Food Safety Partnership (by Food Safety and Standards Authority of India); IT for Industry 4.0 (National Productivity Council); Millennium Alliance Awards (coordinated by FICCI); BRICS Plus Cooperation Forum (at Xiamen, China); and ASEAN India Connectivity Summit (Ministry of External Affairs).
Brief description

The project supports the leather industry in the three clusters around Kanpur (Unnao, Banthar and Jajmau) to sustain conversion of locally available raw hides and skins into exportable products, either directly as genuine leather or leather product, including e.g. footwear. The project introduced appropriate techniques to improve environment and occupational health and safety and delivered sector specific training to improve leather operations. This serves to:

- Promote environmental sustainability and greater production efficiency and application of best practices in leather processing;
- Reduce the amount of pollution generated at source and containing the impact of waste on the environment;
- Create employment and income opportunities in leather sector; and
- Enhance performance of local SMEs, thus enabling their sustainable inclusion in domestic and international supply chains.

Achievements

The project continued and expanded upon activities and achievements, particularly:

- Five E-learning resources and animated training materials were developed covering sustainable leather manufacturing technologies, occupational safety and health and tannery effluent treatment. A blended eLearning course on sustainable leather manufacturing and occupational safety and health was conducted and completed by 97 industry operators. On-site trainings on cleaner technologies were conducted in 22 tanneries. Total number of personnel trained reached about 1,300.
- First ever innovation award system was instituted, with the support of Council for Leather Exports (CLE) and Kanpur Unnao Leather Cluster Development Company Ltd. (KLC), for promotion of cleaner technologies, occupational safety and health (OSH) and energy efficiency in tanneries.
- Technology demonstrations in leather processing technology were undertaken through establishment of eight pilot demonstration units (PDUs) each reducing pollution generation from leather processing. These PDUs cover: hair save unhairing-liming; water mixing and measurement; solar water heating; solar air heating; processing fresh chilled hides; desalting and salt recovery from raw hides;
lime liquor recycling; and water control in fleshing machines. These technologies have been promoted with factsheets that were widely disseminated among tanneries.

- On-site demonstration and implementation of OSH measures in six tanneries with subsequent information dissemination among tanneries in the clusters.
- A baseline assessment on solid waste generation, prevailing practices and recommended measures was compiled and issued through tannery associations.
- Energy and carbon footprint assessments were prepared for six tanneries and compiled to first-ever product carbon footprint (PCF) for finished leather. Moreover, 27 energy efficiency projects were recommended to the industry.
- Existing learning material and courses pertaining to waste minimization and product design have been made available through the Leather Panel (https://leatherpanel.org/), the leading information resource for leather industry.

- A paper on evaluation of Zero Liquid Discharge (ZLD) technology was presented at the XXXIV World Congress of the International Union of Leather Technologists and Chemists Societies (IULTCS) held from 5-8 February 2017 in Chennai.
- Study tours have been organized for industry representatives to Turkey (coinciding with international workshop on Waste Management in Leather Production - Design and Development of Eco-tannery Zones, 2 -13 May 2017 in Bursa) and China (coinciding with World Leather Congress and All China Leather Exhibition, 29 August - 1 September 2017 in Shanghai).
- The project renewed interest for cleaner tanning technologies among tanners, pollution control authorities, research institutions and governmental agencies. Moreover, the focus on occupational safety and health served as eye-opener for tanners in the region.

On-site training by international expert

Awardees at the Innovation Awards Ceremony held in Kanpur (21 July 2017)
**Brief description**

This project set out to enhance competitive position of the Indian cement industry by strengthening the capacity and capability of its nodal technical institution - National Council for Cement and Building Materials (NCCBM) - to provide management and technical support to the cement industry. The project therefore worked towards: facilitation of efficient use of resources through adoption of latest technologies and global best practices in cement plants; and strengthened capacity and service delivery capability of NCCBM. This involves transfer of technical know-how, facilitation of technology transfer and technical capacity-building and knowledge sharing activities for NCCBM. Focus areas include: introduction of alternative fuels and raw materials; best available technologies; CO₂-emissions; patents and intellectual property rights (IPRs); quality management; and health and safety.

**Achievements**

Building upon activities conducted in the previous years, during 2017 project delivered:

- Five technical workshops for scientists and engineers of NCCBM, covering: Patents and intellectual property rights; Global Quality Management (GQM); Occupational Health and Safety (OH&S), CO₂ management; and Alternative Fuels Project Management.
- Three advanced fellowship trainings were conducted for senior NCCBM staff at The Concrete Institute, South Africa (concerning concrete technology services for construction industry); FLSmidth, Denmark/Spain (covering engineering, equipment and related service solutions for cement plants and associated waste processing); VDZ, Germany (German Cement Works Association) (covering cement technology trends and initiatives).
- To enable learning-by-doing, NCCBM’s scientists and engineers were trained in conducting audits for (i) Alternative fuels project management and (ii) CO₂ emissions management in a cement plant by two international experts at a cement plant in Telangana, India.
- Based on the consultations with and documents submitted to BIS, new standard has been issued for cement (IS16415) and use of Construction and Demolition Waste (CDW) has been included in the standard IS383.
DEVELOPMENT AND ADOPTION OF APPROPRIATE TECHNOLOGIES FOR ENHANCING PRODUCTIVITY IN THE PAPER AND PULP SECTOR

Brief description
The project aims to enhance global competitive position of Indian paper and pulp sector by strengthening capacity and capability of its nodal technical institution, Central Pulp and Paper Research Institute (CPPRI), and paper industry associations to provide management and technical support to the pulp and paper industry. The project covered diagnostic assessment to identify technology and institutional gaps, technology benchmarking and capacity building and skill enhancement activities, including transfer of state-of-the-art technologies, technical workshops, international study tours, fellowship training programmes, twinning with international organizations, learning-by-doing and training of trainers. The project focuses on environment-friendly bleaching (with ozone), biochemical/membrane separation processes for reduction of color and TDS in effluents and liquor heat treatment (for energy conservation and chemicals recovery).

Achievements
In continuation of activities conducted in the previous years, during 2017:

• International study tour to industry and research institutes in Sweden and Norway.
• Bench scale demonstrations for Liquor Heat Treatment (LHT), membrane separation and ozone bleaching at CPPRI under guidance of international experts.
• Four industry dissemination workshops were conducted in Saharanpur (05 June 2017), Kolkata (15 September 2017), Vapi (19 September 2071 and Coimbatore (21 September 2017) to share findings of technology assessment, global best practices, and results of laboratory-scale technology demonstrations. International experts from the University of British Columbia (Canada), University of Maine (USA) and Alberta Newsprint Company (Canada) contributed to technical sessions for the identified technology areas.
• An international fellowship training programme was conducted with the support of RISE PFI and the Norwegian University of Science and Technology (NTNU) in Norway 17-27 August 2017) and Innventia in Sweden (27-30 August 2017).
• Joint Declarations for collaboration between CPPRI and following leading international technical institutions were signed: China National Pulp and Paper Research Institute (CNPPI); RISE Paper and Fibre Research Institute, Norway; Bangladesh Paper Mills Association...
(BPMA); and Centre Technique du Paper (CTP), France.

- The Director CPPRI participated in the UNIDO ITPO Tokyo Delegate Programme at INCHEM Tokyo 2017 (20-24 November 2017) representing India with delegates from countries such as Indonesia, Myanmar, Cambodia and Viet Nam. The participants of the programme participated in discussions regarding waste-water treatment and practices, with CPPRI providing context of the same in the Indian paper sector.
**Brief description**

The project is designed to enhance competitiveness of bicycle and bicycle parts sector by strengthening the capacity and capability of its nodal technical institution, Research and Development Centre for Bicycles and Sewing Machines (RDCBSM) and industry associations to provide management and technical support. Project started with diagnostic assessment to identify technology gaps, followed by technology benchmarking and capacity building and skill enhancement activities. The latter covers human and institutional capacity (technical workshops, study tours, fellowship training, institutional twinning, learning-by-doing and training of trainers) and physical infrastructure (equipment for upgrading the testing facility of RDCBSM). This is expected to result in transfer of best practices and latest technologies to the Indian bicycle industry, with a particular focus on surface finishing, metal joining techniques, prototyping, TQM, in turn improving the ability to produce higher quality, premium bicycles.

**Achievements**

Upon project launch in late 2016, during 2017 project activities were put in full swing:

- A diagnostic assessment of RDCBSM and industry associations was undertaken covering technical and institutional aspects, to identify main technology, skills and management gaps. The assessment was based on document review and interviews with bicycle component manufacturers, bicycle companies, representatives of AICMA and UCPMA and RDCBSM staff. An action plan to improve human and institutional capacity was presented.

- Two technical workshops were conducted for RDCBSM, AICMA and UCPMA, respectively covering Patents and Intellectual Property Rights (IPRs) and Standards for the Bicycle Sector.

- The head of RDCBSM undertook fact-finding mission to Japan in June 2017 for discussions with relevant institutions from Japanese bicycle industry (Japan Management Association (JMA), Keio University and select manufacturers from Saitama Prefecture). A follow up workshop took place on 16 November 2017 in Tokyo between General Manager, RDCBSM and Director of Industries and Commerce (Punjab) and Japanese institutions to discuss specific collaboration opportunities.

- Equipment for reflector-testing for bicycles (comprising Tristimulus Colorimeter, Retro-reflection measuring unit, Goniometer) was procured and installed at RDCBSM.
UNIDO Operations in India

Brief description
The project promotes the use and development of production capacity of eco-friendly and cost-effective pesticides derived from neem kernels in three countries of West Africa (Ghana, Sierra Leone and Nigeria). The project's activities included establishment of National Neem Coordinating Cells, technology transfer to three National Technical Partners (Agricultural Universities) for low cost production of Neem based pesticides, field trials, phyto-toxicity studies, generation of crop-specific bio-efficacy data, setting up of demonstration plants (de-pulper, decorticators, crushers, storage facilities) along with training and dissemination activities. Three neem shed pilot facilities for processing and developing the neem-based pesticides were also set up in Ghana, Nigeria and Sierra Leones.

Achievements
Building on prior years achievements, this project was successfully completed in October 2017. The 3rd and final project Steering Committee meeting was combined with a regional closure workshop, in Ghana during 16-17 October 2017. It was chaired by His Excellency, Mr. Birender Singh Yadav, High Commissioner of India to Ghana, and attended by the stakeholders from the three beneficiary countries (Ghana, Nigeria and Sierra Leone).

The project successfully transferred and adopted cost effective production technology for neem-based pesticides in three West African countries. Neem based pesticides have been included in the curriculum of graduate training programme of the Ghana University. The main beneficiaries are resource poor farmers, small and medium enterprises and small-scale village level industries. Farmers gain access to less expensive and abundantly available pesticides improving their self-reliance, and small-scale village industries could avail of the opportunity to use the simple technology to set up micro industries manufacturing the pesticides. The neem sheds developed under the program are fully functional and have become self-sustainable for meeting the requirements of the farming community. There has been increased awareness and usage of eco-friendly, biodegradable crop protection agent viz. neem-based pesticides, and there is a proportional reduction in the use of hazardous chemical pesticide.

The project has resulted in the establishment of a coherent networking at the grass-root level to provide all technical backup for promotion and production of neem-based pesticides. The project has empowered...
farmers, especially resource poor farmers, to make their own pesticide with less dependence on the costly persistent toxic chemical pesticides. The project has resulted in increased participation of women and rural youth especially in the collection, storage and processing of neem seeds. The project also aided waste land development and generated rural employment. Health of the farmers have also improved by switching over from toxic chemical pesticides to environmentally friendly and biodegradable neem-based pesticides. Through reduction of use in polluting chemical fertilizers, health hazards from handling of chemicals, and water and food contamination have reduced. Thus, community as a whole benefited.
The project aimed to strengthen the technical service capabilities of the Kenya Industrial Research and Development Institute (KIRDI). It covered enhancing product design capabilities through the application of CAD/CAM, improvement of product testing capabilities at KIRDI, and provision of holistic support services to prospective Kenyan suppliers in the metal and electronics sector were executed and completed.

The integration with ongoing activities of the Subcontracting and Partnership Exchange Centre (SPX) in Kenya, hosted by KenInvest, was designed to create a holistic UNIDO intervention that goes well beyond the upgrading of some technical capacities of SMEs and access and use of incubation and testing services provided by KIRDI. This integration was part of partnership agreement signed by KIRDI and KenInvest, aimed at bolstering institutional collaboration and ensure project sustainability. The SPX Centre now provides services that link enterprises into supply chains of large transnational corporations and large state-owned enterprises. In addition to mainstream enterprise support interventions assisting in harnessing subcontracting opportunities in and outside Kenya, the programme has led to an improved capability of Kenyan institutions, in particular KenInvest and KIRDI, to design and implement developmental interventions in supplier development.

**Brief description**

In addition to the activities conducted in the previous years:

- A training programme was organized at KIRDI wherein, under the supervision of an Indian expert, five KIRDI personnel who were previously trained at IMTMA (Bangalore) delivered training on the application of CAD/CAM to KIRDI staff (3 days) and selected SMEs (2 days).
- Equipment to improve the product testing capabilities at KIRDI were procured and installed in March 2017.
- A partnership between KIRDI and the SPX host institution KenInvest was formalized by means of Memorandum of Understanding signed in March 2017 to guarantee project sustainability.
- The project closure event was conducted at KIRDI, Nairobi in March 2017, which witnessed presence of the Indian High Commissioner of India to Kenya.

**Achievements**

**Budget**
US$200,000

**Donor**
DIPP

**Duration**
24 months

**Status**
Completed (2017)

**Partners**
- Indian Machine Tool Manufacturer’s Association (IMTMA)
- Kenya Industrial Research and Development Institute (KIRDI)

**Location**
- Nairobi, Kenya

**Training at KIRDI**
4. Outlook 2018

UNIDO’s Mandate

The 17th General Conference took place from 27 November – 1 December 2017 in Vienna. The Indian delegation to the GC was headed by Dr Subhash C Pandey, Additional Secretary and Financial Advisor of DIPP. At the occasion of the GC, Dr Pandey also contributed to panel discussion on implications of Industry 4.0 for inclusive and sustainable industrial development in particular in developing countries.

The 17th General Conference adopted the UNIDO Medium Term Programmatic Framework 2018-2021, with four main components:

- Creating shared prosperity: contributing to poverty eradication and inclusive growth, building productive capacities in an inclusive manner, and providing increased opportunities for all women and men as well as across social groups, including through partnerships with all relevant stakeholders involved in the industrialization process.
- Advancing economic competitiveness: advancing and sustaining rapid industrial growth, through: fostering of entrepreneurship; building of trade capacities in industries; fostering technology transfer, deployment and innovation; and application of modern industrial policies and compliance with global standards and norms.
- Safeguarding the environment: advancing environmentally responsible growth, building institutional capacities for greening industries through cleaner production technologies and resource efficiency methodologies; creating green industries, including in fields of waste management and recycling, supporting energy transitions, and implementing the various multilateral environmental agreements.
- Strengthening knowledge and institutions: UNIDO recently started working on strengthening knowledge and institutions as a strategic priority. It is aimed to integrate all services delivered by UNIDO

Mr Li Yong (DG UNIDO) and Dr Subhash Pandey (AS, DIPP) during 17th General Conference of UNIDO (Vienna, 27 November – 1 December 2017)
across functions and thematic areas for the provision of long-term development results.

**UNIDO India Country Programming Framework 2018-2022**

The UNIDO India Country Programme 2013-2017 came to formal conclusion at the end of 2017. An independent country evaluation with supportive projects evaluations are scheduled to be conducted during first half of 2018. In anticipation thereof, UNIDO in close cooperation with the DIPP, started development of the successor UNIDO India Country Programming Framework (CPF) 2018-2022. Upon review of national industrial development context and policies, and upon consideration of the (draft) United Nations Sustainable Development Framework, a series of stakeholders and government consultations were held during November 2017 to prepare skeleton of the CPF. At the end of 2017, the Key Results Areas (KRA) for the CPF were agreed upon, along with main intervention strategies under each KRA, as summed up in below table and graphic. It was expected that the CPF would be completed and signed by mid 2018, following the completion of the independent country evaluation.

**OVERALL OBJECTIVE: TO INITIATE AND FACILITATE THE TRANSITION TOWARDS INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT IN INDIA**

<table>
<thead>
<tr>
<th>Priority</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productive and resilient MSMEs</strong></td>
<td>By 2022, more MSMEs from manufacturing and related sectors are able to compete and sustain themselves in local, national and/or international markets, by having adopted modern (lean) manufacturing practices, appropriate techniques and market driven designs.</td>
</tr>
<tr>
<td><strong>Solutions for Climate, Resources and Environment</strong></td>
<td>By 2022, more cleantech solutions, in particular those suitable for manufacturing sector, are widely available and applied, resulting in increases in the efficiency of use of energy, materials and water and in reductions in the intensity of generation of waste, effluents and emissions.</td>
</tr>
<tr>
<td><strong>Inclusive and Responsible Value Chains and Businesses</strong></td>
<td>By 2022, manufacturing sectors act more responsibly with enhanced creation of livelihood opportunities in particular for those at risk of marginalization through inclusion of more people and communities in their business operations and value chains and by delivering products and services appropriate and affordable to the urban and rural poor.</td>
</tr>
<tr>
<td><strong>Strategic Policy for Industrial Transformation</strong></td>
<td>By 2022, industrial and related policy directs the transformation to inclusive and sustainable industrialization and is implemented with enhanced public private dialogue and partnership.</td>
</tr>
</tbody>
</table>

*Key Results Areas under the proposed UNIDO India Country Programming Framework 2018-2022*
**Alignment with India’s National Priorities and Policies**

UNIDO’s interventions and projects in India complement national development priorities and missions in India. Since the launch of the ‘Make in India’ mission in September 2014, UNIDO’s ISID mandate has worked in consonance with this campaign to boost industrial development. UNIDO’s activities also work with other initiatives particularly ‘Start-Up India’, ‘Swach Bharat Abhiyan’ and the ‘Smart Cities’ missions.

UNIDO’s interventions and projects in India complement above flagship initiatives of Government of India. UNIDO will continue to work with SMEs towards an efficient and commercially sustainable sector and help the Government of India progress towards Sustainable Development Goal 9 to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. The Government of India’s special focus on the Skilling India will certainly enhance the job opportunity for the youth population. It will not only transform the economic growth from the jobless growth to the employment led industrial growth but also help to increase the manufacturing sector’s share in country’s GDP. The Skill India mission will reduce the shortage of talent pool for skilled workers thereby potentially turn the country as new human resource capital and talent pool for the world. UNIDO is committed to support the Government of India on this important endeavor and is willing to collaborate with respective organizations to develop new and relevant curriculum and training materials. Some of the important areas where UNIDO is already contributing to local capacity building and training are:

- MSME business ecosystem
- Skilled workforce
- Technology quality and management
- MSME business ecosystem
- Energy, renewables and air pollution
- Resources, water and effluents
- Chemicals and waste
- Sustainable livelihoods
- Responsible Business
- Insight and Foresight
- Public Private Development Partnership and dialogue
- Productive and Resilient MSMEs
- Solutions for Climate Resources and Environment
- Inclusive and Responsible Value Chains and Businesses
- Strategic Policy for Industrial Transformation
• Energy efficiency particularly in MSMEs co-located in Industrial clusters.
• Increasing Industrial productivity.
• Maintaining strong supply chain and global value chain.
• Resource Efficient and Cleaner Production (RECP).
• Developing trade capacity and international marketing.

Projects and pipeline development

During 2017 UNIDO operationally completed the preliminary assessments for development of Eco-Industrial Parks, under the global Resource Efficient and Cleaner Production (RECP) programme funded by the Government of Switzerland and implemented in cooperation with the Gujarat Cleaner Production Centre and the Confederation of Indian Industries’ Godrej Green Business Centre. RECP assessments were completed for key enterprises in five industrial estates located across the States of Gujarat, Telangana and Andhra Pradesh. Moreover, opportunities for exchange of wastes and byproducts were identified, along with opportunities for shared environmental infrastructure, such as rooftop PV, common effluent treatment and shared waste recycling and management.

In close cooperation with DIPP, UNIDO developed a diversity of project concepts for potential implementation through the joint IC-ISID. This includes project concepts for India, particularly on: Industry 4.0; leather sector; pulp and paper sector; cement sector (as potential extended projects for projects in these sectors expected to be completed in first half of 2018); food processing clusters and value chains; and electronic systems design and manufacturing. Moreover, diverse concepts have been proposed for South-South Industrial cooperation, including on: promotion and development of neem-based pesticides in Western and South-Eastern Africa; appropriate technologies for cement and paper sectors in SAARC countries (expansion of current India based projects); and replication of GreenCo environmental assessment and rating scheme (potentially to Bangladesh, Nepal and Sri Lanka).

In cooperation with different line ministries and the GEF Focal Point (within the Ministry of Environment, Forests and Climate Change), UNIDO prepared initial concepts for consideration under its 7th replenishment cycle (expected to start from 1st July 2018). This includes project concepts initially developed for 6th cycle, particularly on development of air quality index and management framework and use of low carbon construction materials derived from waste materials. New concepts have also been suggested in regard to further promotion of energy efficiency in industry (targeting large and/or small industries and/or local manufacturing of clean and efficient energy equipment), manufacturing of electronic vehicles, cleantech innovation, resource efficiency in food value chains and circular economy.

UNIDO signed on 13th September 2017 a Memorandum of Understanding with Numaligarh Refinery Limited (NRL) with regard to the planned construction of a bioethanol plant based on bamboo feed stock. UNIDO developed a detailed project proposal to support NRL to set up some 25 bamboo clusters to collect and preprocess bamboo for the biorefinery, whilst also producing additional value-added bamboo products. It is expected this project may start by mid-2018.
5. UNIDO Regional Office in India

The UNIDO Regional Office in India is directly responsible for India, Bhutan, Maldives, Nepal and Sri Lanka and coordinates the UNIDO Country Offices in Afghanistan and Bangladesh. The Regional Office is led by the UNIDO Representative.

Mr. René Van Berkel
Representative in India and Head, Regional Office in India

Mr. Vinay Vij
(Administration)

Mr. Harjit Singh Chandhok
(Accounting)

Mr. Sohan Badhan
(Administrative Support)

Mr. M. Vasudevan
(Driver)