Deliverable 3.9

Strategy Paper for SMCG For Supporting Industries/Industrial Cluster in Implementing Measures for Reducing the Pollution Load to River Ganga

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in consortium with

FICHTNER
WATER & TRANSPORTATION

Consulting Services on Rehabilitation Measures on behalf of the National Mission on Clean Ganga

"Support to Ganga Rejuvenation"
Phase II
Uttarakhand and Uttar Pradesh

India

Indo-German Development Cooperation
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1 Introduction & Background

1.1 SGR Project: A Brief

Under the Indo-German Cooperation, the Government of Germany has extended support to the Government of India through sharing of experiences on river rejuvenation. In this framework, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) implements the project "Support to Ganga Rejuvenation", which contributes to the initiative 'Namami Gange', the umbrella programme for all Ganga Rejuvenation activities of the Indian Government. The project is organised into four fields of activities:

1. Providing strategic support at national level;
2. Consolidating the water partnership between India and the European Union;
3. Sharing knowledge with the private sector and research institutes; and
4. Providing advice on implementation at state level in Uttarakhand and Uttar Pradesh.

The lead executing agency for the project is the Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR). At national level, GIZ implements the project in close coordination with the National Mission for Clean Ganga (NMGC) (New Delhi), the implementing organisation. The key partner at state level is the State Mission for Clean Ganga, which come under the Department of Urban Development (DoUD) and the Department of Drinking Water and Sanitation in the state of Uttar Pradesh and Uttarakhand respectively.

At state level, the German consulting company GOPA-Infra GmbH in consortium with Fichtner GmbH has been contracted by GIZ for implementing the programme component 4 in the states of Uttarakhand and Uttar Pradesh, in close coordination with the SMCGs in the respective states. In these states, the project implements activities in the fields of Municipal Wastewater Management and Industrial Wastewater Management, support to Capacity Development and knowledge-exchange/experience-sharing with project partners.

1.2 Objectives of SGR Project

According to data from Central Pollution Control Board (CPCB, 2015[1]), there are 2,900 industrial regions in India. The water and wastewater management model for these zones varies widely according to the state, the industry and the type of industrial area. While some states are markedly more advanced than others in their adoption of private sector participation, a series of environmental, economic and regulatory drivers are encouraging

[1] Industrial Water Services & Chemicals: Meeting Industrial Water Management Needs Through Centralized Services, Outsourcing Operations and Chemical Solutions, Published by Global Water Intelligence, 2015, p. 117, found under www.giiresearch.com/report/gwi338315-industrial-water-services-chemicals-meeting.html and www.globalwaterintel.com (GWI)

the central government to promote outsourcing models from the initial planning stage. While the evolution of models for mixing public and private finance has led to a few examples of successful build-own-operate (BOO) and build-own-operate-transfer (BOOT) contracts, these are isolated examples of success against what is more generally widespread dissatisfaction[2] with the status quo.

Industrial Estates: These are specific areas chosen by the state government or a private developer as a zone for planned industrial development. In order to attract industrial clients, the developer builds basic infrastructure at the site in advance – the so-called 'plug-and-play' approach – and usually designate certain tax or utility tariff incentives. Special Economic Zones (SEZ), Textiles Parks (ITPs & ETPs) areas designed to promote international exports by exempting producers from excise duties and other taxes, are usually *industrial parks* although they can cover a wider area.

SGR Project in Uttar Pradesh supported activities for the improvement of industrial wastewater treatment from textile industry in existing CETPs and in collaboration with industries in selected industrial estates, showcasing solutions in the field of wastewater management technologies, operations and procedures. This involved field assessment of five textile CETPs, selected ETPs and industries, as well as, extensive meetings with regulatory authorities, state government officials and private sector representatives. Some of the proposals for improved wastewater management practices developed by the project team were immediately implemented by CETP operators leading to significant improvements. These activities focussed on the conveyance, treatment, recycling and reuse of wastewater, the management of sewage sludge, monitoring systems, and improving processes in individual industries. The measures were complemented by training and skills development, and knowledge transfer to companies operating ETPs and CETPs.

In other areas of intervention, the project supported knowledge management and dissemination, as well as, the developing proposals for improved regulatory and institutional conditions at state level.

On the institutional side, SGR-UP's contribution aimed at enhancing SMCG's role in cooperation with the relevant stakeholders. The SMCG needs support in establishing a policy framework for the mainstreaming of green initiatives in its programmes and projects, and to influence other government agencies to take a similar approach. This would require strengthening personal and institutional competences, strengthening of administrative and enforcement mechanism, integrating environmental concerns into sectoral policies and development processes, trying to get the right incentives.

[2] See footnote 1

1.3 National Mission for Clean Ganga (NMCG)

National Mission for Clean Ganga (NMCG) was registered as a society in 2011. It acted as implementation arm of National Ganga River Basin Authority (NGRBA), which has since been dissolved (2016) consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (National Ganga Council)[3].

The National Ganga Council is a five-tier structure at national, state and district level with the objective to take measures for prevention, control and abatement of environmental pollution in river Ganga and to ensure continuous adequate flow of water so as to rejuvenate the river Ganga. The structure is as below:

1. National Ganga Council under chairmanship of Hon'ble Prime Minister of India.
2. Empowered Task Force (ETF) on river Ganga under chairmanship of Hon'ble Union Minister of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation).
3. National Mission for Clean Ganga (NMCG).
4. State Ganga Committees and
5. District Ganga Committees in every specified district abutting river Ganga and its tributaries in the states.

The objectives of the NMCG are to:

1. Ensure effective abatement of pollution and rejuvenation of the river Ganga by adopting a river basin approach to promote inter-sectoral co-ordination for comprehensive planning and management; and
2. Maintain minimum ecological flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.

Similar to the structure at national level, State Programme Management Groups (SPMGs) act as implementing arm of State Ganga Committees at state level.

Key functions of NMCG include:

1. Implement the work programme of National Ganga River Basin Authority (NGRBA).
2. Implement the World Bank supported National Ganga River Basin Project.
3. Coordinate and oversee the implementation of projects sanctioned by Government of India under NGRBA.
4. Accept or to provide any grant of money, loan securities or property of any kind and to undertake and accept the management of any endowment trust, fund or donation not inconsistent with the objectives of NMCG.
5. Take all such action and to enter all such actions as may appear necessary or incidental for the achievements of the objectives of the NGRBA.

[3] Notification no. S.O. 3187(E) dt. 7th October 2016 under EPA, 1986l, Amendment 2 September 2019

1.4 State Mission for Clean Ganga – Uttar Pradesh (SMCG-UP)

State Mission for Clean Ganga-Uttar Pradesh (SMCG-UP) in an extended arm of National Mission for Clean Ganga (NMCG) for the state of Uttar Pradesh and implementing the Namami Gange and other programmes through various executing agencies. At state level it is implementing arm of State Ganga Committee.

Initially under the National Ganga River Basin Authority constituted in 2009, the Central Government had constituted an authority for taking measures of effective abatement of pollution and conservation of river Ganga, in the state of Uttar Pradesh. The said authority constituted was named as Uttar Pradesh State Ganga River Conservation Authority (UPSGRCA), which was registered as society under the Society Registration Act 1860, with headquarter at Lucknow. This society was designated as the Project Management Group for implementation of the NGRBA programme at the state level. Since then, this society was working as State Project Management Group (SPMG) for implementing NGRBA programme in UP till 07.10.2016.

Objectives, Vision and Functions of SMCG-UP

Main Objective of the Mission is pollution abatement in River Ganga and its environmental / ecological improvement and its Vision is restoring the wholesomeness of the river defined in terms of ensuring "Aviral Dhara" (Continuous Flow"), "Nirmal Dhara" ("Unpolluted Flow"), Geologic and ecological integrity. To achieve these, main functions include:-

1. To ensure State Government's consent on the programmes and structures of NGRBA and obtain approval of State Government's share in this programme.
2. To generate public awareness by information, education and publicity derive regarding abatement of water pollution, control and treatment, environmental cleanliness in water of river Ganga.
3. To coordinate and implement the activities of networking of sewerage and sewage treatment structures, remedial steps for treatment of wet land area, river conservation works including using other measures, development of river banks (river front) etc. at State level.
4. To ensure appraisal of feasibility reports (FRs) and detail project reports (DPRs) for programmes under NGRBA.
5. To select the institutions for implementation of projects under NGRBA programme and the implementation of programmes / projects along with the institutions.
6. To manage funds related to land, acquisition for programmes/ projects and to get management of concerned contracts/ agreements.
7. To prepare suggestions and outlines of practicable alternatives to make these projects financially self-supporting by keeping financial discipline intact, for construction of River Pollution Control Schemes.
8. The testing at the time of construction, commissioning, operation and maintenance right from preparation of projects and to ensure the treatment of sewage in accordance to standards prescribed by Government of India, U.P. Government, Central Pollution Control Board and U.P. Pollution Control Board.

9. To get completion of all River Pollution Control related projects within stipulated time, cost and regular monitoring by keeping affective control on quality.
10. To guide concerned Nagar Nigam for its Capacity Building for successful running and maintenance of their projects and to guide for running and maintenance of above projects. After consultation with concerned Nagar Nigam suggest practicable alternatives to make these projects financially self-supporting for meeting out the expenditure incurred on running and maintenance, including long term declaration of fixation of user charges for running and maintenance of such projects.
11. Selection of private institutions for special purpose vehicle (S.P.V's.) and thereafter formation of S.P.V's.
12. To propose works for River Front Development Works on river banks also keeping in view the improvement in the quality for river water after completion of River Pollution Controls Projects, so that the local citizens and tourist visiting the city are attracted towards river banks and to suggest necessary methods for operation and maintenance of such projects to Nagar Nigams for utilization of Nagar Nigam's income generated from tourism, hoardings and other commercial resources.
13. To suggest concerned Nagar Nigams in the activity for charging of necessary amount required for operation and maintenance for 30 years through the firm responsible for the completion of projects with quality and their successful operation as user charges.
14. To include participation of all stake holders in concern works for achievement of above objects and encourage all participants for increase in their share.
15. To get convergence of programmes concerned to other Departments / National Institutions for achievement of above objects.
16. To assist State Mission for Clean Ganga-Uttar Pradesh / State Government for financial resource mobilization from National / International institutions for above works.
17. To execute capacity building activities along with training activities.

1.5 Stakeholders

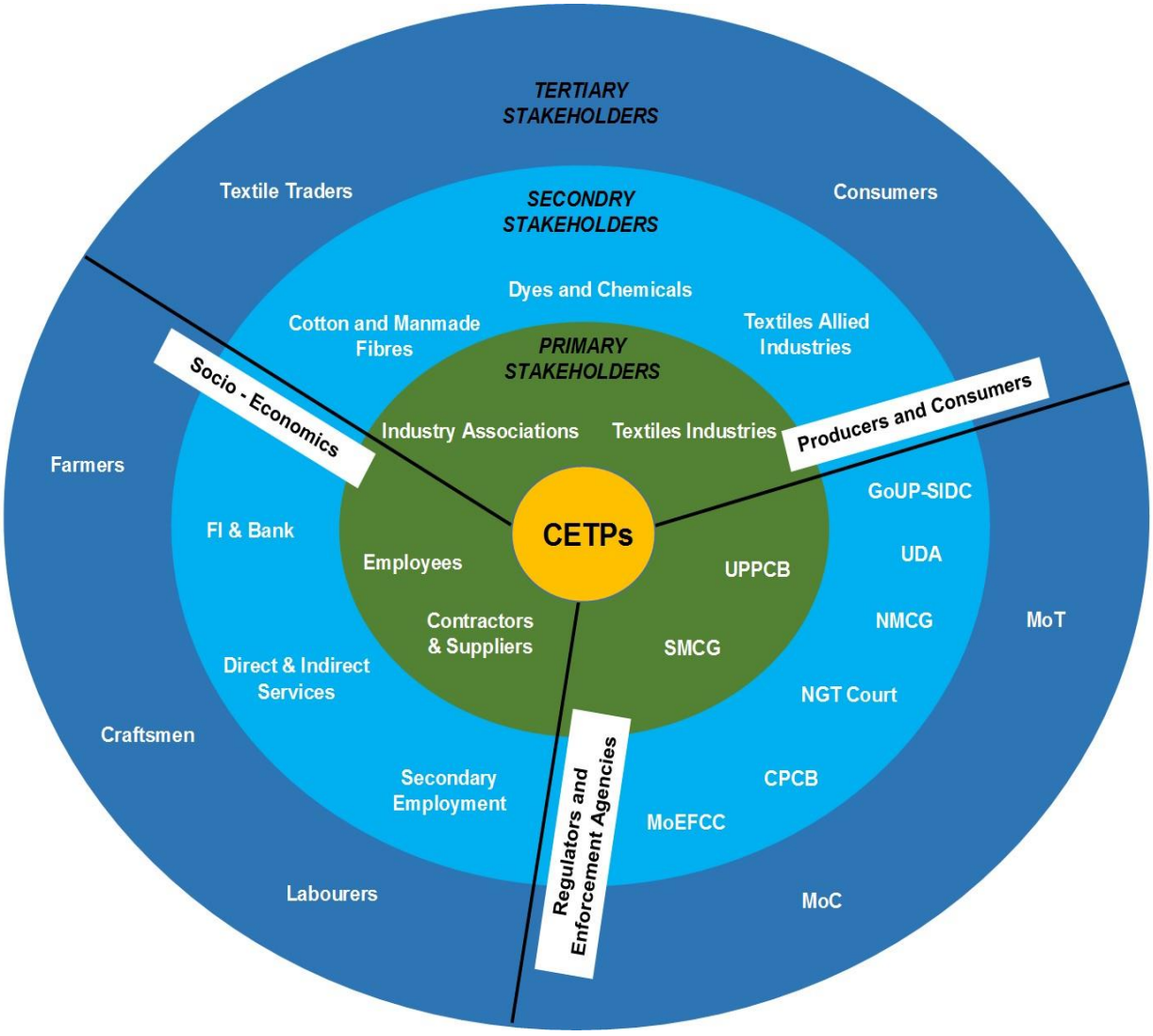
Apart from SMCG-UK and the water authorities UP-Jal Nigam, there are other relevant stakeholders too who are responsible to regulate and enforce measures to monitor and control water pollution effecting River Ganga. They may be summarized as:

Stakeholders	Responsibilities
Min. of Jal Shakti, GoI	In charge of development and regulation of the country's water resources Currently (2020) in the process of developing a National Water Policy for Reuse of Treated Wastewater
Ministry of Textile, GoI	Responsible for the formulation of policy, planning, development, export promotion and regulation of the textile industry in India
Ministry of Environment, Forests & Climate Change, Govt. of India (MoEFCC)	Planning, promoting, coordinating, and overseeing the implementation of environmental and forestry programmes in the country.

Stakeholders	Responsibilities
National Mission for Clean Ganga (NMCG)	Implementing arm of 'Namami Gange', the central government's flagship scheme for rejuvenation of the river Ganges
Central Pollution Control Board (CPCB)	Provides technical assistance and guidance to the State Boards and are responsible for implementation of legislation relating to prevention and control of environmental pollution.
Central Ground Water Board (CGWB)	Responsible for providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country
National Green Tribunal (NGT)	Effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources
The Federation of Indian Chambers of Commerce and Industry (FICCI)	To promote interest in local business possibilities. It provides educational opportunities and assists businesses with the latest marketing and promotional techniques
State Mission for Clean Ganga (SMCG)/ State Program Management Group (SPMG)	Extended arms of NMCG at state level and equally empowered under sec. 5 E(P) Act in the 5 Ganga states
State Pollution Control Boards (SPCB)	Implement the directives from CPCB and advise the state government on any matter concerning the prevention, control or abatement of environment pollution
Regional Development Authorities	Development and regulation of area/region specific plans including civic services and infrastructure
Water Authorities - Jal Nigam / Jal Sansthan	Development and regulation of water supply & sewerage services and for matters connected therewith
State Industrial development Corporations and Industrial development Authorities	Key Government agencies involved in planning, development and promotion of industrial infrastructure in the States
State Textile Industries/department of Textiles	Promote development of industries across textiles value chain, provide incentives and growth initiatives, formulate policies for textiles industries within the state
Industry Associations for different industries or industrial areas	Industry Associations represent the industries in the industrial estates who are the beneficiaries of the common utilities developed. Their voices need to be heard as they will be the direct implementers and beneficiaries of the regulations and without their co-operation, implementation of the new rules is cannot be successful
CETP Developers and Operators	Departments of Government such as SIDCs or Industry Associations or Group of Industries or Industrial Park authorities who develops, Operates and Maintain the CETPs and are directly responsible for sustainable and successful operation and compliance of regulatory norms

Stakeholders	Responsibilities
Waste Water Technology and Equipment Supplier	Companies in the business of equipment and treatment technology, direct beneficiaries as a result of development of CETPs
Environmental Professionals/ Environmental Laboratories/ Academia/ Training & Skill Development Agencies/ Accreditation bodies like NABET/ NABL	The professional agencies/ bodies, professionals, companies, academia and institutions who are direct beneficiaries through providing Engineering Services, Vetting Services, Laboratory Analysis, Skill development courses and programs
Community, NGOs	Individuals, Group of Persons - Directly and indirectly benefited or adversely impacted by Development and Operations of CETPs

Following simplified diagram represent some of the most important stakeholders of CETPs;



2 CETPs - Definition, History, Evolution, Regulatory Framework and Schemes

2.1 Definition, History, Evolution of CETPs in India

Small-scale industries (SSIs) have a very important role in overall industrial development in India and growth of SSI units has been actively promoted by Government of India to induce balanced economic growth and to distribute the benefits of industrial development in an equitable manner. It is estimated that more than 500,000 SSI and MSME units are spread all over India, mainly in about 900 clusters/industrial estates of the country.

It is difficult for each industrial unit to provide and operate individual wastewater treatment plant because of the scale of operations or lack of space or technical manpower. However, the quantum of pollutants emitted by SSIs clusters may be more than an equivalent largescale industry, since the specific rate of generation of pollutants is generally higher because of the inefficient production technologies adopted by SSIs.

2.2 Business Models

Keeping in view the key role played by SSI units and the constraints in complying with pollution control norms individually by these units, the erstwhile Ministry of Environment and Forests (MoEF), presently known as Ministry of Environment and Forests & Climate Change (MoEFCC) initiated an innovative technical and financial support scheme to ensure their growth in an environmentally compatible manner. The scheme promoted common facilities for treatment of effluents generated from SSI units located in clusters through liberal financial assistance. The financial assistance provided under this Common Effluent Treatment Plant (CETP) scheme was as follows: Central Government subsidy- 25% of the project capital cost, State Government subsidy- 25% of the project capital cost, Loans from financial institutions- 30% of the project capital cost, and Entrepreneurs' contribution- 20% of the project capital cost.

The CETP scheme was instituted initially for a period of 10 years with effect from the year 1991 but MoEF has decided to continue financial assistance under the scheme beyond this period, which continued till 2018. Most of the CETPs constructed and commissioned so far were financed under the CETP scheme of Govt. of India.

The concept of CETP was adopted as a way to achieve end-of-pipe treatment of combined wastewater at lower unit cost than could be achieved by individual industries, and to facilitate discharge, monitoring and enforcement by environmental regulatory agencies and the investment of substantial government finances in the CETP scheme was justified on the basis of potential benefits in terms of pollution reduction and environmental improvements.

CETP's in Textiles Clusters were developed as different development & business models. Largely they can be classified as-

1. **State Owned State Run-1 (SOSR-1):** These types of CETPs were developed by Industrial Development Corporation of State of Uttar Pradesh and being operated directly by them. E.g. Tronica City CETP
2. **State Owned State Run-2 (SOSR-2):** These types of CETPs were developed by Urban/Area Development Authorities of State of Uttar Pradesh and being operated directly by them. E.g. Hapur-Pilkhuwa CETP
3. **Association Owned Association Run:** These types of CETPs were developed by Industries Association and are being operated by Industries Association. These cases also includes CETPs inside Designated Textiles Parks developed under various incentive scheme of Government of Uttar Pradesh and India. E.g. Rooma CETP

Present policies of Uttar Pradesh State are instrumental in changing the responsibilities of CETP development and Operations. The existing CETPs are being transferred to Special Purpose Vehicle Companies and the new CETPs are encouraged to be developed through SPVs for better accountability and transparency in operations and compliance.

2.3 Regulatory Framework of CETPs in India

CETPs in India were developed under various models such as Government owned, industrial association owned, industrial parks owned, privately owned etc. The operations of CETPs have been noted to have adopted various models such as operated by Developers, Operated by Contractors and operated by departments. The recent trends in Government policies have shifted the development and operation of CETP to be managed through SPVs (Special Purpose Vehicle) companies with a single business agenda of development and / or Operation of CETPs bringing in transparency in the process of development & operations of CETPs as well as improved overall performance of CETPs on self-sustainable basis.

The CETPs are governed by EPA Act 1986 and The Water Act 1971 mainly, besides other laws which are applicable other that Environment & Pollution Control Laws. The operations and performance of CETPs monitored by State Pollution Control Boards with Central Pollution Control Board acting largely as regulatory monitoring agency to monitor and control water pollution.

NMCG under the Ganga Act and Section 5 of EPA Act 1986, are given special powers to monitor and control pollution in River Ganga. The Powers conferred are the same as of PCBs under Section 5 of EPA Act 1986. NMCG under these acts and provisions thereof is empowered as Regulator of water pollution in Ganga River.

Ministry of Textiles (MOT) with a mission of development of textiles industries in India has a special role for not only textiles industries but for development of CETPs as well. MoT provide financial assistance to textiles clusters through various incentive and assistance schemes, e.g. Scheme of Integrated Textiles Park and Eco Textiles Parks. Under such Schemes, MoT provides financial assistance subsidizing the cost of development of CETPs inside designated/notified Textiles Parks as a part of the industrial infrastructure.

Recent developments of judicial activism through active interactions of Citizens and NGOs have forced CETPs to bring under the jurisdiction of National Green Tribunal – The National Green Court of India. In last 5 years a series of directives have been passed by NGT effecting CETPs, most of which have been accepted by Central and State Pollution Control Boards as instruments of enforcement.

3 Textile Clusters in Uttar Pradesh

India is second largest textile fibre producer in the world with production of around 9 million tonnes as recorded in 2015-16. India is also largest producer of cotton and jute and second largest producer of silk in the world. Textiles industries accounts for approximately 15% of total exports by value from India. Textiles and Apparel sector is second largest employment provider in India employing nearly 51 million people directly and 68 Million people indirectly (Data 2015-16).

Textiles sector is one of the traditional industries in state of Uttar Pradesh and its third highest fabric producing State in India producing nearly 13.5% of the National production. Uttar Pradesh has 58 spinning mills and 74 textile mills in Non-SSI sector. UP is also largest market for textiles and handlooms with over 200 Million consumer base. Most of the textile units are clustered in different variety of textiles processing clusters largely depending on homogenise processes and products. The Textiles clusters are spread all across the State of Uttar Pradesh from Mathura to Varanasi processing wide variety of textiles and handlooms[4].

From the angle of NMCG's mission goals, the textiles clusters can be classified into two broad categories, i.e. Wastewater generating clusters (Water Polluting) and Zero Wastewater generating clusters. While most of the processes of textiles production are non-polluting (e.g. Spinning, Weaving, Sizing, Knitting, Garmenting, etc.), Dyeing and Printing process are the biggest contributor of waste water generation among textiles processes.

Some of the textile clusters generating wastewater from their operations have the facility of Common Effluent Treatment Plants for the treatment of wastewater. Remaining clusters are in process of development of CETPs in Uttar Pradesh. None of the CETP in Uttar Pradesh has been developed under Zero Liquid Discharge (ZLD) Model resulting in the treated wastewater disposal into River Ganga or Ganga River Basin directly or indirectly.

[4] Source: https://niveshmitra.up.nic.in/txtle_Policy.aspx, http://upinvestorssummit.com/htm/01/img/pdf/sector/TEXTILE.pdf

3.1 Selected Textile Cluster in UP under SGR Project

In the state of Uttar Pradesh, the Support to Ganga Rejuvenation (SGR) project is active since November 2018, by providing advisory services and exchange of knowledge to support improved management of industrial wastewater in the textile sector. These include supporting efficiency improvements of 5 textile CETPs/ETPs through suggestions for improved treatment process, technologies, O&M mechanism and capacity building of the operators / responsible actors. Another focus is advising relevant industries of the textile cluster concerning modern wastewater technologies and methods. SGR is one of the most important projects of GIZ under Indo-German Bi-lateral co-operation. GOPA Infra GmbH of Germany has been entrusted the responsibility to extend technical co-operation by GIZ under Indo-German Co-operation framework.

As noted earlier, the textile industries have spread all across the State of Uttar Pradesh with majority of wastewater generating industries have developed in clusters. There are standalone textile industries as well which are not situated in clusters, the wastewater generated from such industries is treated in such industries as per the directives of Hon'ble Supreme Court. The Clusters are better positioned with wastewater treatment through adaptation of centralized and common wastewater treatment leading to financial benefits to industries. As an important part of SGR project, 5 CETPs and ETPs inside selected clusters were assessed for suggesting improvement measures.

The 5 CETPs/ETPs and industrial cluster have been identified in close consultation with the NMCG (National Mission for Clean Ganga) and SMCG (State Mission for Clean Ganga) in Uttar Pradesh. These are:

1. Bhadohi CETP, Bhadohi, UP
2. Rooma CETP, Kanpur, UP
3. Pilkhuwa CETP, Hapur, UP
4. Mathura CETP, Mathura, UP
5. Tronica City CETP, Loni, Ghaziabad &, UP

Following chapter focuses on summary of findings through assessment of selected CETPs and improvement measures suggested as an outcome of site visits, technical assessment, and interactions with CETP developers, industries associations, regulators, industries and other stakeholders.

3.2 SWOT Analysis of NMCG/SMCG's Legal Standing vis-à-vis Mandated Role

This Chapter presents SWOT analysis of NMCG and SMCG's standing as authority vis-à-vis the present situation and its effectiveness to implement regulatory framework.

Strength	Weakness
1. Powers under EPA Act 1986 2. Highly skilled technical and managerial manpower at NMCG 3. Funding agency for projects under Namami Gange mission mandate 4. Mission directly administered by Central Government with SMCGs serving as extended arms in each of the 5 states in the stem of the River Ganga and with likely reach out to all the 11 states in the Ganga basin. 5. Capacity of appointment of skilled and knowledgeable technical manpower @ SMCG for effectively combating pollution in various types of industries 6. Apex body of National Ganga Council under chairmanship of Hon'ble Prime Minister and Inter Ministry co-ordination part of National Government framework 7. Access to International expertise on institutional, technical and sustainability issues due to direct linkages with international, multilateral and bi-lateral co-operation agencies	1. No direct role as a regulator 2. Limited skill level (techno-legal), personnel strength and institutional wherewithal at NMCG/ SMCG to perform the functions of a regulator/ enforcement agency on behalf of the State Ganga Committee 3. Role in funded projects, generally limited to just procurement and contract execution. 4. Weak linkages with State departments & agencies and linkages other that Utilities (UPJN) 5. Effectively no role in development of industrial clusters, instatement of new industries and expansion / modernization of industries or any other polluting entities alongside the river Ganga or its basin. 6. No direct collection of data on CETP effluents. This data is supposed to be submitted to the relevant SPCBs.
Opportunities	**Threats**
1. To exercise powers under sec 5 of E (P) Act 1986 2. Utilization of skilled manpower for capacity building and strengthening of SMCGs 3. To regulate development and so to control pollution, to launch incentive schemes 4. To create effective co-ordination and collaboration platform at State level through already existing State and District level Ganga Committees and regulators/ enforcement agencies 5. To facilitate environmental regulators and contribute in building advanced knowledge base, extend resources of Central Government in establishing Centres of Excellence as well as to disseminate and engage proactively the multi-lateral and bi-lateral agencies	1. Conflicting priorities / issues with current regulators under E (P) Act 1986, i.e. UPPCB & CPCB and can be perceived as a parallel/ superfluous enforcement agency. 2. Can have resistance from both the industries as well as limited co-operation from other enforcement agencies – particularly UPPCB and CPCB. 3. Attrition of SMCG officials, due to contractual engagement. 4. Sustenance of the establishment given no revenue streams, would cause its natural death unless supported by perpetual grants. 5. Conflicting interests of state authorities on industrialization, revenue, employment versus environmental concerns associated with industries. 6. Presently no monitoring mechanism for incentive schemes. May require change in State's laws and regulations 7. May require long-term sustainability planning due to ever changing state's policies and enforcement strategies of State and National Government 8. Requires additional knowledge base and other internal resources to contribute towards regulatory role for industries and industry clusters

Although NMCG is not a regulatory agency per se, it is given regulatory powers under the EP Act and Ganga Act. However, there are overlapping responsibilities regarding monitoring of industrial effluents discharged in Ganga with PCB: for example, CETPs are required to submit online monitoring data from effluents to the competent State Pollution Control Boards. No formal data exchange system is set up between SPCBs and SMCGs. As NMCG / SMCGs are in charge of ensuring abatement of pollution in Ganga, the lack of data is a severe constraint. Important is also that the Chairmanship of the State Ganga Council residing with the Hon'ble Prime Minister ensures high-level inter-ministerial coordination, but linkages with relevant agencies at state level should be strengthened.

In summary, NMCG is uniquely placed in the regulatory framework and can play multiple role of regulator as well as facilitator of textile clusters and CETPs across the state of Uttar Pradesh. This, however, would require a process of institutional strengthening and further clarification of roles and relationships with key stakeholders and the implementation of strategic actions, as detailed in chapter 4.

3.3 SWOT Analysis Water Pollution Abatement and Control Strategy through CETPs

This Chapter presents SWOT (Strength, Weakness, Opportunities and Threat) analysis of CETPs as end-of-pipe treatment option for combined industrial effluents of small industries. The analysis refers in particular to the Indian context.

Strength	Weakness
1. CETPs represents usually as the general representative unit of the industrial cluster / estate, rather than representing a single industrial unit 2. CETPs have collective responsibility for treatment of wastewater resulting from a cluster or industrial estate, whereas ETPs treats that of respective industrial unit 3. CETPs are easy to monitor by regulators, as they offer collective responsibility of wastewater treatment & only one source of wastewater discharge to environment 4. Usually, CETPs are substantially financed by Government bodies making them capable to adopt appropriate treatment and Best Available Technologies 5. CETPs having potential to become an attractive and sustainable business model, attracting investors and professional companies 6. CETPs can offer relatively reliable compliance requirements vis-à-vis individual industries 7. CETPs offer comparatively cost-effective wastewater treatment compared to individual ETPs	1. CETPs are largely governed by wastewater generators, sometimes compromising the very objectives they have been created for 2. CETPs are prone to major disturbances due to discharge of non-compliant wastewater discharge into CETPs drainage system 3. CETPs requires dedicated wastewater conveyance system, adding the requirement of monitoring and maintenance of additional infrastructure by CETP operators, in addition of CETP itself. 4. CETPs requires, in its first phase of installation and commissioning, substantial financial contribution and liabilities, till it becomes capable to meet the operational and other expenses 5. CETP development and operation requires co-ordination with multiple Government departments such as Revenue, Industrial Development, District Authorities, Disaster Management Authorities etc.

Opportunities	Threats
1. An effective mechanism to enforce and maintain compliance with Pollution Control Laws and Regulations 2. CETPs usually function as growth accelerator for Industrialization and rapid development of industrial cluster / estates 3. CETPs can be used as an effective platform for co-ordination of multiple Government department and agencies for effective and rapid delivery of Government services and disbursement of incentives to different types of incentives under various Government Schemes 4. CETPs have potential to initiate programs of Recycle of Treated Wastewater, wherever feasible 5. CETPs can function as an effective platform for delivery of obligations under Corporate Social Responsibility (CSR) through collaborative approach – to the intended communities and environment 6. CETPs can be used as an effective platform for knowledge exchange, cleaner production centres, centre of excellence, training centres and research & development centres for the benefit of industrial units 7. CETPs can also be used as a platform to proliferate and implement direct and immediate incentives to industries who wishfully select to reduce pollution control, through various schemes such as Effluent Trading Scheme. 8. CETPs, largely developed through SPVs, is an appropriate platform to distribute secondary incentives to member industries 9. CETPs are appropriate platform to enforce policy measures & regulations through cluster enforcement mechanism 10. CETPs have demonstrated the development of entrepreneurism for installation of industrial units to manufacture added value products having very expensive wastewater treatment obligations, thus helping the economy and nation to produce important products (such as pharmaceuticals) at reduced cost	1. Poor co-ordination with industrial stakeholders, Government departments and agencies prior to development and post development can lead to loss of investment and generation of Non-Performing Assets (NPAs) 2. Stricter monitoring and enforcement by CETP operators may lead to Indirect Discharge (By-pass) of wastewater 3. Sustained non-compliance of CETPs leads to punitive actions on the cluster as a whole, without considering the industrial units who remain fully compliant on their part 4. CETPs are designed and created envisaging or considering existing industries and future development of industries of specific types. Rapidly changing industrial product's demand calls for rapid modernization and upgradation of CETP infrastructure inviting additional and frequent investments 5. CETPs operated by industrial associations have a potential to lean towards surviving industrial and member industries interest. CETPs operated by Government department (such as SIDCs or UDAs) have a potential to lean towards surviving departmental interests and financial restriction leading to situation of compromise with regulatory compliance obligations 6. CETP business model requires detailed financial planning. If not planned appropriately CETPs can become defunct due to poor / inadequate / inefficacious financial management 7. Judicial Orders (such as those of NGT, High Courts, Supreme Court) put CETPs into immediately effecting environment, unbalancing CETPs Financial Planning as well as CETP operations at large

From the brief SWOT analysis presented above, it can be safely concluded that CETPs are important infrastructure, which suit to textiles industries and clusters in the State of Uttar Pradesh as well as in India, as vast majority of textile industries are classified as Micro, Small and Medium Scale Enterprises (MSMEs). CETPs can also bolster development of textile industries in designated clusters. Suggestions to target the weaknesses identified in the matrix and issues described below are exposed in detail in chapter 4.

3.4 Issues of Textile Clusters and CETPs at a Glance

The table below presents an overview of the findings in the four operational textile CETPs in Uttar Pradesh. The findings are organized according to Administrative, Technical and Operational aspects. The comparison allows to identify common issues and to propose recommendations for the relevant authorities on how to support the cluster meeting its regulatory standards and address operational issues.

The case of Bhadohi CETP has been excluded from the presented findings below as it was never a performing asset, making it a classic example why further strengthening of policy framework are required.

Table 1: Major Issues at CETPs in Uttar Pradesh Textiles Clusters

Aspect	Observations / Suggestions			
	Rooma, Kanpur	Pilkhuwa, Hapur	Mathura	Tronica City, Ghaziabad
Administrative				
Planning	Very poor, required to be up-graded	Moderate	Under the new contract facilitated by NMCG	Issues in planning. Matter noted at NGT. The industries members are on disagreement with owners (UPSIDC) over several issues. Require up-front agreement with members in co-ordination with UPPCB
Development (DPR)	2 DPR existing. Quality not satisfactory, require to be up-graded.	DPR has been prepared. HPDA presently do not have funds for major up-gradation of CETP as well as capacity enhancement.	Satisfactory, under the supervision of NMCG DPR have been developed, tender in process	Issues with development and capacity
Finance	Very poor, required to be up-graded	HPDA presently do not have funds for major up-gradation of CETP as well as capacity enhancement. A long-term sustainable finance model is required	Satisfactory, under the support of NMCG for upgradation	Issues with Finance Recovery of funds
Sustainability	Sustainable in short term, medium to long to long term sustainability is questionable. No tariff system in place	Sustainable in present state, requires planning for long term sustainable model. No tariff system in place	Sustainable in short term, medium to long to long term sustainability is questionable. No tariff system in place	Non sustainable model in present state. No tariff system in place
Human Resources	Very poor, required to be up-graded	Presently managed and operated by HPDA through their dedicated officers	Planned to be up-graded under the up-gradation project, require post up-gradation investigations	Requires major up-gradation
Technical				
Appropriateness of Technology / Treatment Processes at CETP	Requires holistic approach starting with detailed wastewater analysis, wastewater inventory, clusters' wastewater generation capacity analysis & justification for capacity, medium to long term	Satisfactory in present status, adoption of holistic approach for long term planning is suggested	Detailed wastewater analysis, justification for capacity and medium to long term enhancement forecast, treatability studies and pilot trials might have added value to the proposed up-gradation project	Requires further assessment

	enhancement forecast, treatability studies and pilot trials			
Operation	Not satisfactory in present state	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019)	Not satisfactory in present state, requires post up-gradation investigations	Requires further assessment
Laboratory management	Not satisfactory in present state	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019). Laboratory requires up-gradation	Not satisfactory in present state, requires post up-gradation investigations	Requires further assessment
Preventive & Breakdown Management	Not satisfactory in present state	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019)	Not satisfactory in present state, requires post up-gradation investigations	Requires further assessment
Energy Efficiency	Very Poor, Not satisfactory in present state	Moderate, can be enhanced through various measures	Very Poor, Not satisfactory in present state, requires post up-gradation investigations	Requires further assessment
Sludge / Hazardous Waste Management	Poor, being upgraded in phased manner	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019)	Very Poor, Not satisfactory in present state, requires post up-gradation investigations	Requires major up-gradation
Indirect Discharge Management	Very Poor, Not satisfactory in present state	Poor, Not satisfactory in present state. HPDA has initiated actions to stop IDM	Very Poor, Not satisfactory in present state, requires post up-gradation investigations	Requires further consolidated efforts
Members level wastewater monitoring	Does not exist,	Does not exist, Required to be included in CETP management (Outside prevue of CETP Operation agency)	Does not exist, Not satisfactory in present state, requires post up-gradation investigations	Requires further assessment
Managerial				
Appropriateness of Operators / staff	Poor, Not satisfactory in present state	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019)	Very Poor, Not satisfactory in present state, require post up-gradation investigations	Requires further assessment
Skills of Staff	Very Poor, Not satisfactory in present state	Satisfactory in present state, through professional and experienced contractors (Contract ending November-2019)	Very Poor, Not satisfactory in present state, require post up-gradation investigations	Requires further assessment

Co-ordination with external stakeholders	Very poor, lead to frequent closures of CETP forcing Industries to shut down and industrial production at reduced capacities	Satisfactory in present state, through HPDA officials	Satisfactory as of now, under the supervision of NMCG	Very poor
Legal issue management (NGT and Others)	Very poor, lead to frequent closures of CETP forcing Industries to shut down and industrial production at reduced capacities	Satisfactory in present state, through HPDA officials	Satisfactory as of now, under the supervision of NMCG	Improper handling
Professional Management	Not satisfactory, requires major up-gradation	SPV does not exist. HPDA is in process to form SPV for Management of Assets and Operation and Management of CETP	Very Poor, Not satisfactory in present state, require post up-gradation investigations	Requires further assessment

3.5 Major Challenges of Textile CETPs

From the details and assessment presented in this chapter, the major issues and challenges of textiles clusters and CETPs can be classified in three major aspects, as explained below.

3.5.1 Institutional Issues

CETP is considered as an allied infrastructure often developed by State Industrial Development agencies in the industrial parks developed by them. These IDA have hardly any environmental experts nor have a fair understanding of the CETP requirements. Hence, often end up building sub-optimal infrastructure. The CETPs built by UPSIDC in Loni and Kanpur are clear indications of this. Not only are these CETPs designed to manage the effluent flow of the industrial estates but even the CETPs were found to be much below its rated capacity on review by third party. Bhadohi CETP represent the classic case of disconnect between important functionaries of the state as it was never connected to the industries and to date remains a new yet dysfunctional structure.

3.5.2 Techno-managerial Issues

As noted before, the CETPs in UP are being transferred to Special Purpose Vehicle (SPV) companies for better and transparent management and practices. However, SPVs in UP's textile sector needs lots of techno-managerial handholding as well need to be instilled their environmental obligations. Often, it's noticed the discharge norms of Zero Liquid discharge is practically not feasible, unless the market forces enable the same. This needs a time bound implementation plan; which NMCG could facilitate through exercise of powers and interventions entrusted upon them.

3.5.3 Sustainability & Financial Issues

Not a single CETP in State of Uttar Pradesh has been developed considering medium to long term financial sustainability measures. In all the CETPs assessed, a robust and sustainable financial planning was missing, as well as, users' charges that reflect costs, an efficient revenue collection system and provisions to cover O&M and development/upgrading costs. Such issues serious hamper the sustainability and growth of textiles industries and clusters, often leading to situations where textiles industries are forced to shut down for indefinite and prolonged time span due to sustained non-compliance with norms and regulations because of old and inefficient CETP infrastructure, e.g. Rooma Textiles Park & Tronica City Apparel Park.

It is therefore suggested to develop a strategy by NMCG to support industrial cluster in implementing the economically feasible, environment friendly and sustainable measures for reducing the pollution load to River Ganga. The proposed strategy is explained in next chapter.

4 Strategic Interventions for Economically Feasible, Environment Friendly and Sustainable Measures

NMCG is uniquely placed in the enforcement framework to control pollution in the holy River Ganga through extraordinary powers conferred under the EP Act 1986 as well as the Ganga Act. NMCG having technical manpower, dedicated budget, enforceable measures and interventions deemed fit to achieve the goal of Namami Gange Mission, have strategic and tactical opportunities to implement State's and GoI' s policies and mandate more effectively through additional interventions leading to enhanced performance of regulatory framework.

Presently the government focuses on creating infrastructure (STPs, CETPs, sewers, surface cleaning), funding and technology. But additional efforts are required to bring governance issues to focus to ensure that expenditure and efforts put vide creating infrastructure, infusion of funds and adaption of technologies - function as designed and there is accountable, participatory governance to achieve desired goals.

The criticism in national media noted - "The lockdown[5] has shown how industrial effluents were chocking the life of the rivers and how miserably the CPCB and PCBs have failed in taking actions against polluting industries despite the fact that Water Prevention and Abatement of Pollution Act, 1974 clearly states that no polluting effluents should be discharged in the water bodies including rivers." Such criticism having considered in true letter and spirit calls for additional interventions by NMCG to elevate its functions and role as Regulator and Facilitator to support industries/industrial cluster in implementing the economically feasible, environment friendly and sustainable measures for reducing the pollution load to River Ganga.

The interventions suggested herewith are briefly explained as proposed strategy to support industries/industrial cluster in implementing the economically feasible, environment friendly and sustainable measures for reducing the pollution load to River Ganga.

4.1 Regulatory Interventions

1. Development of a common platform in collaboration with CPCB and State PCBs linked to online monitoring system for all CETPs across the States falling under the purview of Namami Gange project. Giving NMCG/SMCGs access to effluents data, this intervention would enhance monitoring of CETPs directly through SMCGs and hence industrial wastewater pollution reaching Ganga River.
2. NMCG's states arms SMCG should be a part (ex-officio) of State Level Environmental Steering Committees and Board of Directors of State Pollution Control Boards through appointment of designated officials from SMCGs. This would strengthen the delivery of

[5] Lockdown imposed by GoI to control spread of Covid 19 infections starting in March 2020 for approx. four months. The lockdown involved cessation of most of economic activities, including industrial production and, therefore, also discharge of effluents in the rivers. As a consequence, already two months into the lockdown, most rivers showed significant improvement in water quality.

Namami Ganga's mandate and involve SMCGs in decision making regarding development of new polluting industries, modernization and expansion of existing industries & to monitoring polluting activities directly.

3. SMCGs should be a part of EACs of MoEFCC (State Level Environmental Appraisal Committee), as well as, SEAC (State Level Expert Appraisal Committee) of States under the Namami Gange Project, which decides and recommends permissions for polluting and issues environmental clearance certificate for projects falling under EIA Notification 2006.
4. In consultation with MoEFCC, develop special regulations under Ganga Act 2017 for CETPs in the Ganga River Basin and ensure direct monitoring of compliance through competent SMCGs
5. Consent to Establishment (CTE), Consent to Operate (CTO) and Environment Clearance (EC) Applications for Industries and CETPs discharging treated waste into Ganga River directly or indirectly should be subject to tier 1 and 2 environmental reviews.
6. For Ganga Basin, define criteria, guiding principles and framework of CETP development and operations (new projects and upgradation), including formation of Special Purpose Vehicle (SPV) companies for CETPs management.

4.2 Financial Interventions

NMCG, being a funding agency on behalf of Government of India, can direct State's enforcement and Regulatory agencies for special measures such as:

1. As a condition to receive financial assistance or grants from NMCG for CETP development/upgradation, SMCG officials (1 per CETP) should be appointed on board of CETPs / SPVs (Nominee Directors) to observe and enforce compliance measures.
2. NMCG usually provides close-ended financial grants to CETPs without any condition for recovery. Instead of present practice, NMCG may provide financial assistance as Long Term Interest Free Loans and performance-Based loans. Recovered loans can be used to facilitate industries to adopt environmentally friendly techniques and technologies and facilitating adoption of Best Available Technologies for textiles cluster through Circular Financing Principles. Such efforts have started in Textiles Clusters in India and showing multiplier effects of improvements at Industry Level & impact on Environment.
3. Facilitation to Industries vide establishment of Cleaner Production Centres advising industries on adoption of Cleaner Production Measures and Best Available Technologies, which leads to minimal water pollution. Such centres can finance techniques and technologies under open-ended Circular Financing models benefiting a series of industries in finance chain
4. Define incentives and prepare and execute incentive disbursement plan for Industrial units / CETPs who achieve reduction in pollution levels. The incentives can in the form of reduced wastewater treatment charges, additional & extended CETP membership. Schemes such as Effluent/ Emission Trading Schemes are very popular and effective in western countries and they can also be considered to incentivize the efforts of industries vide direct financial gains

5. Advise State SIDCs, Industries Commissionerate's and other State Government Departments who finance CETPs and Industries under various incentive and financial assistance schemes for financial security, means and measures to avoid generating non-performing assets, converting non-performing assets to tangible assets and long-term sustainability of industrial units and CETPs
6. Develop, promote and incentivize Wastewater Recycling, Zero Liquid Discharge and Integrated Sludge Management as a part of overall Environmental Management Plan of Industrial units as well as CETPs
7. To extend the support and incentives to Industries, Industries Clusters and CETPs under various initiatives and projects under planning, development and execution towards achieving Sustainable Development Goals (SDGs)

4.3 Institutional Interventions

1. Co-ordinate with various Ministries, Government Departments & other Industrial Development Agencies such as Ministry of Textiles, Ministry of Industries, MSME, Ministry of Water (Jal Shakti), Department of River Conservation (NRCD) for preparing and execution of action plans with integrated approach and combined participation of multiple stakeholders mandated for the similar objectives. Such collaboration is also effective to prepare and implement integrated monitoring plans of water quality.
2. Support CETP SPVs through capacity building, financial assistance, technical support to create additional platforms such as R&D centres, training centres, Disaster Management centres and centres of Excellence for implementing the economically feasible, environment friendly and sustainable measures for reducing the pollution load to River Ganga
3. Promote and launch associated efforts along-with Bi-Lateral, Multilateral and UN agencies and Development Corporations and Banks to facilitate Knowledge Exchange, Improved Business Processes, Technical Know-how, Capacity Building and Trainings, Demonstrated Experiments and Implementation of BATs, in accordance with the agreed agenda of co-operation with respective Agencies, IDCAs and IFIs
4. Proliferate knowledge base on Best Textiles Industrial Practices, Minimal Hazardous Discharge, Optimal use of raw materials, enhanced productivity, Adoption of Best Available Technologies, practices & Techniques in Textiles Sector in co-ordination with Ministry of Textiles of Government of India and Government of Uttar Pradesh.

Annex

Clarification of Terms

What is Cleaner Production (CP)?
Cleaner production is a preventive, company-specific environmental protection initiative. It is intended to minimize waste and emissions and maximize product output.[1] By analysing the flow of materials and energy in a company, one tries to identify options to minimize waste and emissions out of industrial processes through source reduction strategies. Improvements of organisation and technology help to reduce or suggest better choices in use of materials and energy, and to avoid waste, waste water generation, and gaseous emissions, and also waste heat and noise.

What is Circular Economy Finance (CEF)?
Circular Economy Finance is any type of instrument where the investments will be exclusively applied to finance or re-finance, in part or in full, new and/or existing eligible companies or projects in the circular economy

What are Sustainable Development Goals (SDG)?
The Sustainable Development Goals are a collection of 17 global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs, set in 2015 by the United Nations General Assembly and intended to be achieved by the year 2030, are part of UN Resolution 70/1, the 2030 Agenda

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