## OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.


## DISCLAIMER



## FAIR USE POLICY



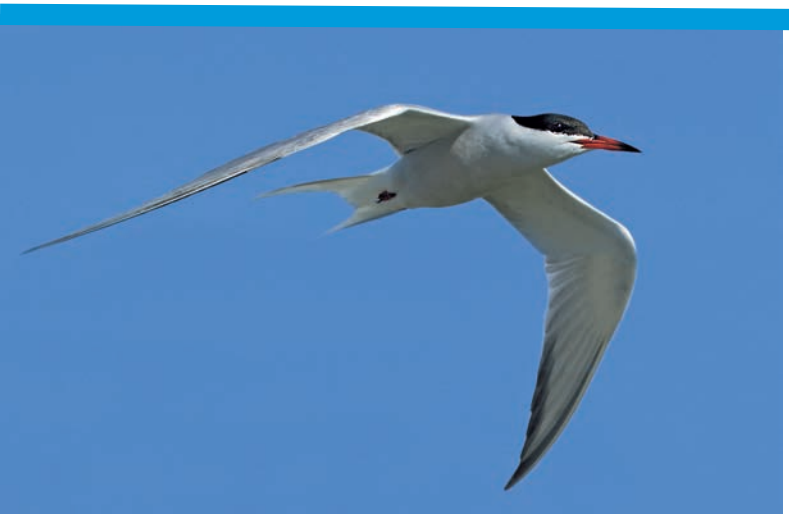
## CONTACT

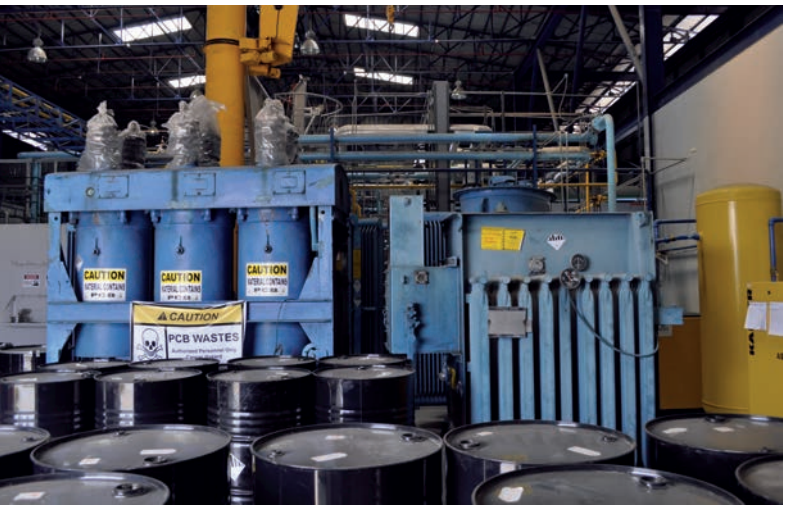
Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION






# Enhancing the scope of UNIDO-GEF cooperation

## CREATING SHARED PROSPERITY AND SAFEGUARDING THE ENVIRONMENT

INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

# UNIDO strategies for the GEF-6 replenishment cycle

## A working paper

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION


KW

# Contents



For related video links go to UNIDO-GEF You Tube playlist (http://bit.ly/1myi4OG)

# The UNIDO-GEF partnership

Established in 1991, the Global Environment Facility (GEF) – in partnership with international institutions, civil society organizations, and the private sector – has contributed greatly to the effort of addressing global environmental issues. Today the GEF is by far the largest provider of funds for environmental initiatives.

UNIDO's cooperation with the GEF dates back to the 1990s, when the Organization began to assist countries on issues related to managing persistent organic pollutants, reducing human exposure to mercury, and ensuring compliance with the provisions of the Montreal Protocol on Substances that Deplete the Ozone Layer.

Since 2006, UNIDO as an implementing agency for the GEF has been able to link its work on industrial energy efficiency and renewable energy applications with the GEF's financial assistance on climate change mitigation. This coordination of efforts has brought technical and financial assistance to countries, which had no access to GEF financing before.

Looking ahead to the GEF-6 Replenishment Cycle (2014-18), UNIDO fully supports the strategic direction of the GEF, the continuation of programming under the existing focal areas, as well as the piloting of the GEF-6 integrated approaches. The Organization stands ready to collaborate within the GEF partnership in all areas covered by its mandate.

UNIDO will continue its efforts to deal with the underlying causes of environmental degradation and to help countries to safeguard their environment, while delivering on the Organization's core mandate to promote inclusive and sustainable industrial development.

# 1. Comparative advantages of UNIDO as a GEF implementing agency

## 1.1 Inclusive and sustainable industrial development (ISID)

Poverty eradication is a daunting challenge that requires concerted efforts across the full spectrum of development cooperation. This is what the new sustainable development agenda currently being formulated to succeed the UN Millennium Development Goals has to live up to.

In its landmark Lima Declaration of December 2013, UNIDO spells out a new vision of its role in the campaign to address today's prevailing social and environmental challenges. The Organization will pursue inclusive and sustainable industrial development to harness industry's full potential to contribute to lasting prosperity for all. In the words of UNIDO Director General LI Yong, our challenge now, and our historic opportunity, is to recognize the potential of ISID, and to contribute our efforts for the common good in a new long-term development agenda.

UNIDO strives to link its GEF projects with the Organization's two ISID priorities – creating shared prosperity and safeguarding the environment – where its GEF-funded initiatives have the potential of positive synergetic effects in the pursuit of the overall objectives of inclusive and sustainable industrial development.

**Creating shared prosperity**
*Economic growth is driven by entrepreneurship, continuous economic diversification, growing trade relations, industrial upgrading and technological innovation.*

The UNIDO-GEF portfolio in its entirety benefits from the Organization's ability to engage the private sector in general and small and medium-size enterprises in particular in its projects, as well as from UNIDO's emphasis on integrated multifocal projects. Working closely with private sector companies and foundations in both recipient and donor countries, UNIDO builds strategic partnerships that advance inclusive and sustainable industrial development while simultaneously promoting business values and addressing the causes of global environmental degradation.

UNIDO is able to harnesses the expertise and resources of the private sector to tackle important global industrial development and environmental issues, as well as to select the right tools in catalysing enabling environments. The Organization leverages its expertise in industrial development when creating partnerships with micro, small, and medium-size enterprises, industry associations as well as multinational corporations to assist recipient countries, which range in level of economic performance from LDCs to middle-income countries and BRIC economies.

**Safeguarding the environment**
*We cannot deny that one side effect of industrialization is its considerable environmental footprint. There is no country that has yet fully resolved the issues of waste management, water purification and pollution.*

UNIDO has long recognized that environmental issues must be addressed and cleaner production methodologies must be promoted at a systemic level in industrial development. The promotion of resource utilization efficiency and cleaner production requires a perspective and a decision-making process that simultaneously consider economic value and environmental sustainability. Industry, as the prime producer of goods and services that societies consume, has a critical role to play.

The Green Industry concept, with its focus on the elimination or significant reduction of the dependence on hydrocarbon fuels, toxins, and equipment and processes that generate greenhouse gases, is one of the adequate answers that UNIDO has developed and promotes in its global forum and technical cooperation activities.

Relying on its technical expertise, UNIDO will continue to attend to these global challenges. Continued UNIDO-GEF cooperation will allow both organizations to further help countries around the world strive to find a viable balance between the pursuit of prosperity and sound environmental stewardship.

### 1.2 Technical assistance services delivered by specialized assets

UNIDO's Energy Branch (ENE) carries out GEF-supported projects under the climate change mitigation cluster that focus on: (i) providing access of the poor to rural energy for economic use, with emphasis on renewable energy; (ii) increasing productivity and competitiveness by improving industrial energy efficiency; and (iii) reducing emissions of greenhouse gases through capacity building projects designed in conformity with the United Nations Framework Convention on Climate Change. In the focal area of Climate Change Mitigation, the Trade Capacity-Building Branch provides support to ENE related to energy standards and relevant training. Additional assistance on work with SMEs is provided by the Business, Investment and Technology Service Branch.

The Environment Branch (ENV) continues to expand its GEF portfolio related to chemicals by providing technical and capacity building support in: (i) cleaner and sustainable production; (ii) POPs management and disposal; and (iii) mercury contamination reduction. In the focal area of Chemicals and Waste, the Trade Capacity-Building Branch provides support to ENV related to energy standards and relevant training. Additional assistance on work with SMEs is provided by the Business, Investment and Technology Service Branch. Within ENV, the Montreal Protocol Unit offers services to countries with economies in transition, helping them to phase out ozone-depleting substances (ODS) through policy, strategy and programme design; institutional support; and technical assistance to enterprises. UNIDO's Environment Branch also renders services in the area of water management. More specifically, it deals with the use of water resources, the sustainable use of integrated trans-boundary river basins, wetlands, coastal zones and large marine ecosystems (LMEs), and the recovery and sustainable management of industrial fisheries.

As of 2013, UNIDO works in the Climate Change Adaptation area, focusing on increasing climate change resilience of productive value chains. In this focal area, UNIDO promotes the application of resource-efficient and cleaner production methods, techniques and policies as a starting point for achieving resource-efficient, low-carbon and climate-resilient industrial development. In UNIDO's key thematic area of "Poverty reduction through productive activities," the Agribusiness Development Branch aims to assist countries in increasing resilience and reducing post-harvest losses in agribusiness value and supply chains, which will make a vital contribution to adapting to the impacts of increasing weather variability, frequency of extreme events, and longer-term climate changes, which in most cases are already reducing crop yields and increasing yield variability. It is imperative that climate change is considered as part of UNIDO's agro-value (and supply) chain analyses, which entails reviewing each stage in these chains and identifying areas at risk, followed by interventions to reduce vulnerability.

### 1.3 Partnerships for significant and sustainable impact

Partnerships and regional cooperation have proven to be an innovative and practical approach to address the multidimensional context of economic deprivation, social inequality, and environmental degradation – a context that any response to achieve poverty eradication, the overarching goal of the post-2015 development agenda, will need to consider if it is to be successful.

In industrial activities, the move towards low-carbon production pathways is key in order to make a significant contribution to the goals just stated. Moreover, there is general agreement that such pathways entail barriers to the

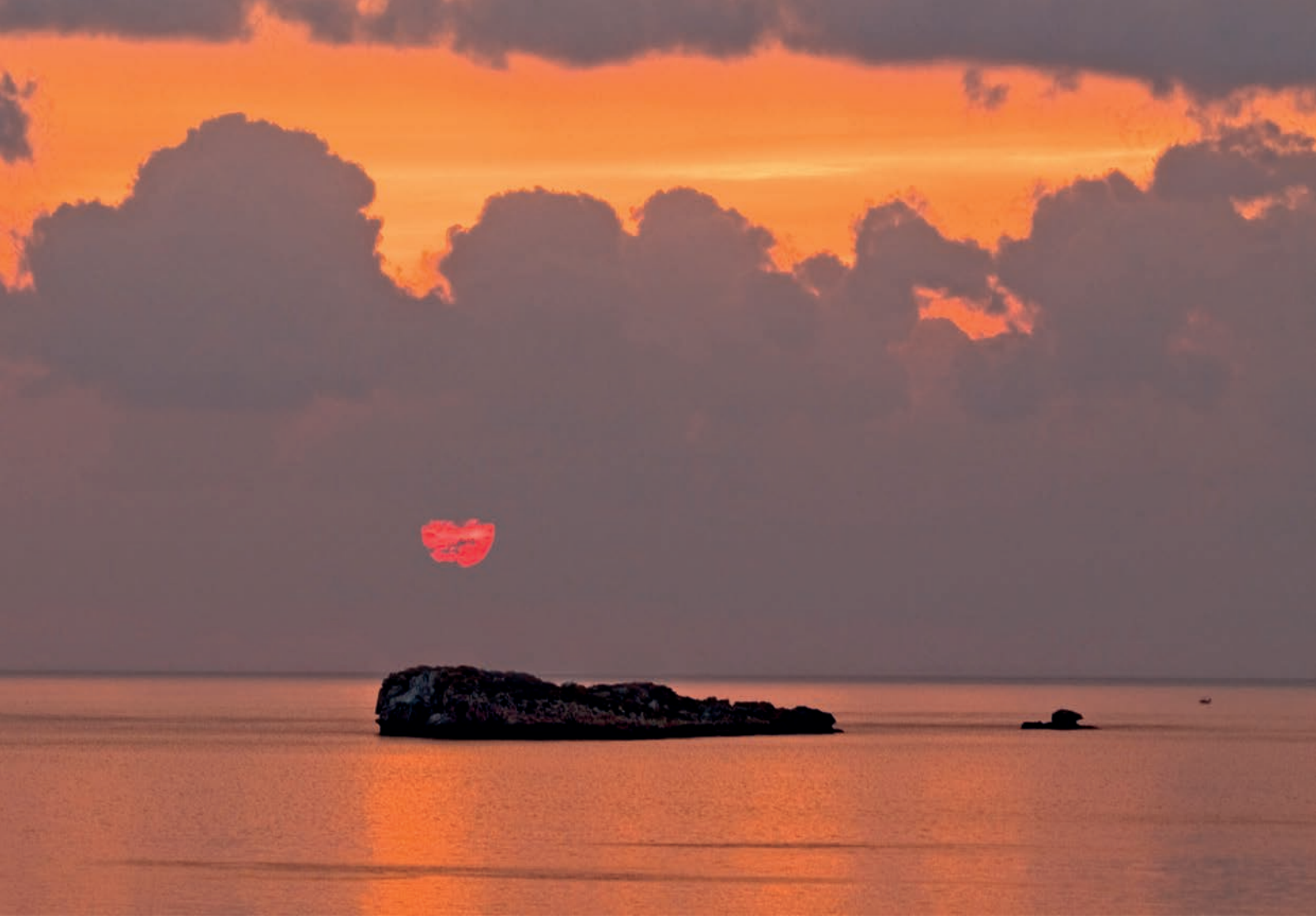
dissemination of renewable energy and energy efficiency as well as to clean and climate-friendly technologies and approaches that transcend national boundaries. UNIDO has taken steps to address this issue by establishing a range of partnerships – for knowledge sharing, capacity building, and the promotion of investments – that assist developing countries and economies in transition in embracing inclusive and sustainable industrial development. These partnerships can be broadly divided into three categories: (i) transformational partnerships, (ii) strategic partnerships (including business partnerships), and (iii) knowledge partnerships.

The first category includes initiatives such as Sustainable Energy for All and UN Energy. Strategic partnerships encompass a wide range of engagements with various entities, centres and networks such as regional sustainable energy knowledge centres (e.g., the Centre for Renewable Energy and Energy Efficiency of the Economic Community of West African States), international technology centres (e.g., International Centre on Small Hydropower, International Solar Energy Centre for Technology Promotion and Transfer), Resource-Efficient and Cleaner Production centres and networks (e.g., Centro Mexicano para la Producción más Limpia) as well as with the Climate Technology Centre and Network (CTCN), where UNIDO is closely cooperating with UNEP. On the latter, UNIDO, together with a consortium including 13 institutions spearheaded by UNEP, promotes accelerated, diversified and scaled-up transfer of environmentally sound technologies for climate change mitigation and adaptation in developing countries, in line with their sustainable development priorities. UNIDO's participation, as co-leader of the Centre, will help bring about wider impacts of technology development and transfer, and scale up support to developing countries in their efforts to address climate change. This category also encompasses partnerships with business such as within the framework of the Green Industry Platform, the "Clean technology innovation programme for SMEs" and individual companies such as Schneider, Philips and Statoil. Finally, UNIDO is actively pursuing relationships with knowledge partners (among them TERI and the Renewable Energy and Energy Efficiency Partnership) for the development and implementation of its projects and programmes. Through the creation of strong partnerships, UNIDO not only meets donor requirements with respect to private sector engagement and multi-country approaches, but is able to facilitate the adoption of regional polices and targets and to prepare industries for national and regional markets as well as to foster South-South technical cooperation.

Through their activities and reach, these partnerships are making important contributions to addressing the underlying drivers of environmental degradation, while fostering innovation and synergies in and across projects and programmes, and helping to deliver cost-effectively the highest impact. It is expected that by 2015, at the dawn of a new development agenda, further partnerships and regional cooperation will have been established as they are seen to offer one of the most promising and cost-efficient options to promote inclusive and sustainable industrial development across regions. The centres and networks play a vital role, especially in programmatic approaches, for promoting policy and capacity development, knowledge management, awareness raising as well as investment and business promotion. They are an important link between individual countries and the global post-2015 development processes.

UNIDO recognizes that gender equality, which is crucial to achieving sustainable development, can also contribute significantly to meeting GEF goals. In all of its projects, the Organization is committed to give a more comprehensive and effective response to the need to enhance the economic empowerment and leadership of women. UNIDO consistently strives to promote the levelling of the playing field, and the Organization's entire portfolio of technical cooperation initiatives focuses on helping women to acquire skills and gain access to resources that allow them to compete effectively in the economic life of their communities. Involving women, through women's groups and associations, at all stages of the economic value chain provides them with access to new employment and entrepreneurship opportunities and helps them escape multiple forms of deprivation.

Finally, with a field presence in more than fifty countries and a worldwide pool of experts and trainers, UNIDO can leverage its global resources, and those of its partners, to achieve significant and sustainable scale and impact in its endeavours.



# 2. Climate change mitigation

According to the Intergovernmental Panel on Climate Change and the Global Energy Assessment reports, the industrial sector is responsible for one third of global primary energy use and two fifths of global energy-related carbon dioxide emissions. There is significant potential to reduce the amount of energy used to manufacture most products. The technical reduction potential ranges from about 10% to 40% for several energy-intensive industrial sub-sectors. The economic and environmental gains are also significant when seen in the context of efficient use of clean energy by industry. Furthermore, there is a large potential for the use of renewables globally and especially in developing countries and countries with economies in transition. Capturing the full extent of these potential improvements is essential if the world is to be put on a path of stabilizing greenhouse gas concentrations at a level that would address climate challenges effectively.

## 2.1 Energy and climate change flagship programmes

UNIDO's primary mandate is to promote inclusive and sustainable industrial development. In line with its mandate, the Organization designs and implements energy and climate change projects and programmes aimed at helping developing countries and countries with economies in transition to:

- increase the competitiveness of their industries by reducing industrial energy intensity;
- enhance the viability of their enterprises, particularly in rural areas, by increasing access to modern energy for productive uses; and
- reduce their impact on climate by lowering the greenhouse gas emissions of their industries.

In order to meet these objectives, UNIDO's GEF energy portfolio focuses on three key areas:

- promoting cleaner and more efficient use of energy by industry – industrial energy efficiency (systems, standards, ISO 50001);
- facilitating productive activities, particularly in rural areas, through increased access to modern energy services based on renewable sources of energy; and
- integrating energy efficiency and renewable energy interventions for low-emissions industrial growth, and forging synergies and partnerships for multifocal and inter-disciplinary projects.

The main focus of UNIDO's energy and climate change strategy for the GEF-6 cycle will be to design inter-disciplinary flagship programmes covering multifocal areas and crosscutting themes and issues.

**Clean technology innovation programme for SMEs**
Small and medium-size businesses make up more than 90% of world enterprises, and they represent the backbone of the manufacturing sector of most economies in transition and developing countries. A shift towards sustainable and climate/environment compatible development will necessarily require a "clean" upgrade and modernization of SME skills, production processes, and products, which can generate substantial additional socio-economic benefits.

Building on its experience and on-going projects, UNIDO proposes to develop a flagship programme under GEF-6 to promote and support the establishment of a global network of national clean technology accelerator programmes as an effective platform to catalyse and accelerate innovations in clean energy and environmental technology in the SME sector.

The flagship programme will leverage the knowledge assets accrued within the scope of GEF priorities on private sector involvement and UNIDO's pilot implementations of the clean technology programme during GEF-5. It will pursue opportunities for South-South cooperation, making use of private sector expertise and investors' experience gained in past clean technology projects in developing countries. The programme will also seek ways to capitalize on its increasing coverage to enhance visibility, participation, and impact.

**Strategic regional sustainable energy centres programme**

The GEF Strategic Programme for West Africa (SPWA), which was approved in 2008, has demonstrated the added value of regional programmatic approaches to climate change mitigation and adaptation. The regional programme has been coordinated by UNIDO in cooperation with the Economic Community of West African States (ECOWAS) Centre for Renewable Energy and Energy Efficiency (ECREEE) under the regional GEF project "Promoting coordination, coherence, integration and knowledge management."

The West Africa programme has produced a broad range of high-impact results. Twenty-one country-level renewable energy and energy efficiency projects co-funded by the GEF are under implementation. The programme also facilitated the establishment of ECREEE (www.ecreee.org), the adoption of ECOWAS renewable energy and energy efficiency policies and targets in fifteen countries, and the establishment of the ECOWAS Observatory for Renewable Energy and Energy Efficiency, a unique information system for sustainable energy investors and project developers (www.ecowrex.org). The involvement of ECREEE ensures the sustainability of the SPWA also beyond the lifetime of the programme.

Building on the experience gained and the success of ECREEE as a best-practice model, UNIDO, in cooperation with other regional communities such as the Southern African Development Community, and the East African Community, the Secretariat of the South Pacific (SPC) and the Caribbean Community (CARICOM), is now working to establish similar sustainable energy centres. The proposed regional centres will implement an extensive programme aimed at introducing and scaling up integrated low-carbon technologies by promoting sustainable energy policy frameworks, demonstration projects, investments, knowledge exchange, and enhanced regional cooperation and integration of markets. The expansion of the network opens up opportunities for the GEF to support similar regional approaches as in West Africa. The centres could become regional hubs for ensuring the sustainability and dissemination of GEF energy project results beyond the lifetimes of the projects in the respective region. The various centres are cooperating under the Global Network facilitated by UNIDO.

The regional centres of the Southern African Development Community and the East African Community are likely to become operational in 2015.

**Integrating energy efficiency and renewable energy interventions for industry**

During the GEF-4 and GEF-5 cycles, UNIDO designed numerous integrated GEF projects combining renewable energy and energy efficiency interventions for industry in developing countries. Building on its experience gained under the on-going projects, the Organization's Energy Branch will continue to develop and scale up such integrated projects, which will not only introduce ISO-compatible energy management systems and system optimization in the industrial sector, but also promote renewable energy for fuel switching in heating and cooling applications.

Under GEF-6, such projects will lead to the transformation of the energy market by introducing best practices and technology transfer through clean energy initiatives to reduce emissions of greenhouse gases and thereby improve the environment in the target countries. In addition, UNIDO aims to promote low-carbon road transport that supports sustainable

industrialization and urbanization. The specific interventions will focus on integrating policy and planning, fostering innovation and technology transfer, supporting infrastructure, and developing renewable/alternative fuels value chains.

With its integrated approaches, UNIDO has been particularly active assisting SMEs in improving their productivity and helping them with resource mobilization.

**Integrated multifocal 360º energy nexus**
This programme will specifically capitalize on the synergies entailed by integrated energy projects that pursue multiple environmental benefits by focusing on partnerships and on linkages between thematic areas such as:

- energy – chemicals
- energy – resource efficiency
- energy – water efficiency
- energy – food security
- energy – land degradation
- energy – air quality

The programme will build on and consolidate UNIDO's past and on-going experience with multi-focal projects, interventions targeting two or more focal areas, such as POPs + energy efficiency, ODS + energy efficiency, or renewable energy + ODS. A good example is assisting medium-size and large industries in improving energy efficiency and reducing POPs emissions; potential beneficiaries of such assistance are the cement and metal sectors, where the twin objectives of higher energy efficiencies and lower emissions of dioxin and furans could be met. The energy – water nexus will be addressed by supporting utilities in improving energy efficiency and the integration of renewable energy solutions for water pumping and desalination.

The programme will take a systematic approach during the project development phase to identify and screen potential synergies and to draw up a blueprint of implementation activities and outputs.

**Building upon existing global and regional energy initiatives and strategies**
Working closely with UN Agencies and strategic partners such as the United Nations Development Programme, the United Nations Environment Programme, the United Nations Department of Economic and Social Affairs, the World Bank, the United Nations Foundation, and with stakeholders in the private sector, UNIDO has been actively engaged in the implementation of system-wide and global initiatives in the area of sustainable energy – such as UN Energy and the Secretary General's Initiative on Sustainable Energy for All (SE4All).

The combination of the three major goals of SE4All – universal energy access, a doubling of the rate of improvement in energy efficiency, and a doubling of the share of renewable energy by 2030 – established the basis for a positive compact between developed and developing nations as well as their institutions to come together on one platform and to act jointly in a coherent and timely manner to make sustainable energy for all a reality.

Building upon on-going programmes in renewable energy, energy efficiency, environmental management, and low carbon technologies, UNIDO will focus in particular on tangible actions and results-oriented interventions capable to enable the global transition to a more inclusive and sustainable model of industrialization and economic growth.

In this context, UNIDO will also augment its efforts in the area of energy efficiency and renewable energy standards, which in recent years have made a strong comeback as key policy instruments to drive market transformation and technology transfer as well as the acceptance of best practices in energy auditing and management. UNIDO will work with the GEF and ISO to develop a global program on standards for energy efficiency and renewable energy as a high-impact opportunity under the SE4All Action Agenda.

### 2.2 Industrial energy efficiency priorities

The strategic areas and themes that will remain or become priorities for UNIDO's industrial energy efficiency technical cooperation projects and assistance during GEF-6:

**Dissemination of energy management systems and system optimization to small economies in transition and developing countries**
UNIDO will continue to promote and support global dissemination of energy management systems and system optimization best practices and technologies by targeting small economies in transition and developing countries where the potential for substantial reductions in industrial emissions of greenhouse gases exists or is rapidly materializing as a result of significant growth in the industrial sector.

Given the crosscutting relevance of energy management systems and system optimization, the projects will also target, where appropriate, large energy consumers in the utility and commercial sectors.

Industrial energy efficiency projects will pay increasing attention to fiscal policies, long-term target-setting agreements and regulation to accelerate and expand the adoption of energy management and investments in energy efficiency. Special attention will be given to the conformity assessment aspect of Energy Management system, by addressing the need to create mechanisms to certify and accredit the competencies of energy experts and auditors.

Furthermore UNIDO is striving to expand its leading role in developing energy efficiency standards for energy-intensive industrial equipment, as well as in establishing testing facilities and capacity for energy performance assessment. While substantial work has been carried out to globally promote and disseminate energy efficiency labels and standards for appliances, very little has been done so far for industrial equipment, despite the significant energy saving potential that some ubiquitous equipment offers.

**Energy-efficient design and low-carbon technologies in manufacturing sectors**
UNIDO aims to boost energy-efficient design and low-carbon technology innovation in manufacturing sectors with a special focus on energy-intensive SMEs. It is necessary to increase efforts for a greater integration of energy-efficient design principles in the manufacturing of products as well as for increased localization of innovation in low-carbon technologies that can substantially expand their market penetration and beneficial environmental impact.

This initiative will promote and support the transfer of best available energy-efficient design technologies/practices and will combine technology and investment promotion with the design of policies that can support broad and accelerated market penetration. Moreover, it will focus on establishing partnerships with the private sector and collaboration with financing institutions.

Building on successful past and on-going pilot experiences, the initiative will seek, for example, to expand the Burkina Faso cook-stove program to other least developed countries in Africa and elsewhere. For more advanced economies, products with high energy consumption such as industrial equipment and construction materials will receive special attention during project design for the GEF-6 cycle.

This initiative will have a global scope with the possibility to be regionally focused where context or technology may call for a multi-country approach to ensure greater cost effectiveness and a greater impact on climate change mitigation.

**Initiative on monitoring, reporting and verification of energy consumption, energy savings, and derived abatement of emissions of greenhouse gases**

The capability of governments and enterprises to measure and monitor energy performance is a precondition for sound policymaking as well as for demonstrating the financial/economic benefits of their programmes, investments, and projects in order to secure sustained support.

Insufficient energy consumption data is a key barrier that many developing country governments face when assessing energy efficiency policy choices. At enterprise level, the lack of appropriate methodologies to adopt energy efficiency measures and to monitor their performance hinders energy managers in their attempt to demonstrate the benefits of energy efficiency investment decisions.

UNIDO proposes to develop and scale up a monitoring, reporting and verification (MRV) system as a key building block for new and more effective industrial energy efficiency policies, in particular performance and market-based approaches such as target-setting agreements, fiscal and financial incentives, white certificates, and others.

The approach that is being contemplated will also assist countries in meeting the objectives agreed upon in the Bali Action Plan of the United Nations Framework Convention on Climate Change, which defined a new concept of accounting for greenhouse gas emission mitigation measures, which have to be measurable, reportable and verifiable.

**Global initiative on industrial energy efficiency benchmarking**

Meaningful energy efficiency benchmarks offer key guidance for decision-making at enterprise level with respect to allocation of resources and investments in energy efficiency and management. The current availability of meaningful energy efficiency benchmarks and indicators in industry is very limited; it is basically concentrated in traditional, so-called energy-intensive sectors/sub-sectors (iron and steel, cement, petrochemicals, pulp and paper), while non-energy-intensive industrial sectors account for 40% of industrial energy consumption worldwide, and a large majority of companies operating in these sectors are SMEs.

UNIDO will aim to generate and disseminate knowledge and tools to develop global energy efficiency benchmarks for industrial sectors where SMEs have a dominant presence. This initiative will aim at developing a standard legal framework for confidentiality and treatment of data; it will pilot energy efficiency benchmarking methodologies in selected countries and sectors, and will capitalize on synergies with work carried out under GEF-4 and GEF-5.

The initiative will establish and maintain a web-based platform for energy efficiency benchmarking and provide training and tools to key beneficiaries and stakeholders such as enterprises, policymakers, donors, financing institutions, service providers, and equipment suppliers. Flagship reports with global energy efficiency benchmarks for selected sectors will be published periodically.

### 2.3 Renewable energy priorities

The projects outlined below cover strategic areas and themes that will remain or become priorities for UNIDO's renewable energy technical cooperation projects and assistance.

**Renewable energy smart mini-grid systems for improved energy access and productive uses**
UNIDO will build on the work done in the GEF-4 and GEF-5 funding cycles, and will aim to scale up rural energy solutions based on renewable energy smart mini-grids in order to improve energy access and expand rural industrialization in selected countries and regions. The Organization will promote renewable energy technologies such as small hydropower systems, which can generate electricity in a sustainable manner and without major civil works using falls and drops in the existing water canals.

This initiative will provide innovative business models to deliver affordable and reliable energy services in rural areas through smart mini-grids. The program will conduct local capacity development for the application of renewable energy technologies, and will foster business and market development to scale up operations. The business models will be based both on innovation and on traditional local knowledge and assure that they uphold the principle of inclusiveness.

Active involvement of SMEs will be pursued to promote local manufacturing, retailing, and operation and management services required by renewable energy mini-grids. In addition, the link between energy services and productive activities will give a high relevance to the initiative in rural communities as envisaged under SE4All.

**Promoting the use of bioenergy for electricity/heat generation, industrial processes and income generation activities**
UNIDO will promote and support an initiative in selected countries or regions to exploit the potential of integrating bioenergy solutions into industries – particularly agro-industries – tapping into existing opportunities and infrastructure to achieve resource efficiency. Industries that produce biomass waste or residues can turn these via a range of technologies including combustion, gasification, and anaerobic digestion into a resource for their production processes or an additional source of income from heat and/or electricity generation, thus contributing to decreasing pollution and deforestation.

This initiative will aim at developing innovative business models to allow targeted industries to end up as renewable energy producers for internal use and providers of electricity/heat to surrounding communities, thus contributing to improving local competitiveness as well as to environmental protection. The initiative will promote the use of wastes or by-products of existing processes, with only relatively minor investments required to collect, store, and in some cases pre-treat the waste. Investments in new technologies to produce power and heat or fuels from the readily available biomass waste and residues will also be required, but the cost of such technologies is decreasing, while their efficiency and environmental performance are improving. Another objective is job creation, as experience shows that the bioenergy sector often creates spin-off companies such as fertilizer producers in the case of biogas-based systems.

The initiative will combine policy development support (sustainability and emission standards, technical regulations and guidelines, etc.) with the creation of appropriate supply chains, best available technology demonstrations, skill development for the operation and maintenance of bioenergy plants, and market promotion; the objective is to provide the best fit for a given country's industrial context and the largest reductions in emissions of greenhouse gases.

UNIDO will foster South-South cooperation in this area, using the know-how and experience of countries like India and Brazil, which have gained significant experience in disseminating appropriate technology.

**Promoting solar and biomass thermal energy in industrial operations**
UNIDO will continue to foster the use of solar energy and biomass gasification for heating in manufacturing industries, but will switch from a company-based to a sector-based approach to trigger a transformation effect across industrial sectors and thereby contribute to meeting the overall objective of inclusive and sustainable low-carbon industrial development.

The initiative will focus on industries with a significant potential to use installations of solar water heaters and biomass gasifiers, such as pharmaceuticals, chemicals, metal treatment, textiles, food processing, dairy, automobiles, paper and pulp, tobacco, etc. Significant quantities of hot water and steam are also required in the commercial sector (for example, in hotels, hostels, and restaurants) as well as in hospitals and some public institutions, which can also resort to renewable energy systems.

At a first stage, the initiative will target simpler and cheaper technologies (such as flat-plate collectors) in sectors with low-temperature demand to replace expensive fossil fuels (such as heavy fuel oil); there are situations where the barriers are primarily non-technical and non-economic, but rather have to do with a lack of demonstration projects and locally available expertise.

At a later stage, more advanced solutions – such as concentrating solar and hybrid technologies and biomass gasification – will be brought to bear once such technologies mature and become less costly.

**Global initiative on developing standards for renewable energy equipment and systems**
Renewable energy standards are instrumental in achieving national and international energy and trade objectives as they represent policy-driven market-based tools that are voluntary in nature, increase industrial competitiveness, and facilitate international trade and fair market access. While national and sectoral initiatives are being developed, this program will promote the harmonization of international standards and stimulate their adoption, taking into account the specific conditions in the countries and regions in question.

The overarching objective of UNIDO's initiative will be to make renewable energy standards work as an effective policy tool and market-based mechanism to improve market access, stimulate trade, and help achieve the objectives of Inclusive and Sustainable Industrial Development (ISID). Specifically, the Organization will help both policymakers and private sector enterprises in emerging markets and industrialized countries to improve technical know-how on the adoption of standards and to upgrade conformity assessment services.

The tasks will include developing best practices and case studies for policymakers, mapping national renewable energy standards, validating approaches on the ground, designing and implementing testing capacity, and capacity building for industry and project developers. Information portals are also foreseen in order to widely disseminate results. The work will be carried out in close cooperation with the International Renewable Energy Agency, and the International Centre for Trade and Sustainable Development.

# 3. Climate change adaptation

## 3.1 Building up resilience to the effects of climate change

Human adaptation can be broadly described as the process of adjustment to actual or expected change and its effects in order to moderate harm or exploit potential benefits. Adaptation does not occur instantaneously; individuals or communities require agency, ability and willingness to realize their adaptive capacity and adapt successfully. A suitable enabling environment is needed to ensure that individuals and societies are capable of making the adjustments necessary to respond effectively to change.

Adaptation manifests itself in a number of forms, is undertaken by various agents, and occurs at multiple scales. Adaptation practices can be either anticipatory or reactive and, depending on the degree of spontaneity, can be autonomous or planned. Accordingly, there are distinctions between adaptation as a programmatic approach and adaptive actions and processes by individual households, communities or institutions; the former is largely planned, seeking to facilitate effective and sustainable adaptation by the society as a whole and avoid maladaptation; the latter is generally associated with actions in anticipation of – or more commonly as a reaction to – shocks and stresses. Indeed, it should be noted that adaptive actions are not necessarily positive; short-term benefits gained from actions taken in response to shocks and stresses caused by change can in some cases lead to increased vulnerability in the long term (maladaptation).

In order to understand the impact of climate change at the local level, it is important to recognize the interactions between climate change and other development factors. People adapt to pressures caused by climate change, such as rising food prices, the spread of diseases, and competition over natural resources. Adaptation is driven by a range of different pressures acting together. Also, the impacts of climate change will not be the same for all; vulnerability to climate change pressures often comes from vulnerability in a general sense – from poverty and marginalization. Supporting local adaptive capacity cannot therefore be seen in isolation as "climate change programming." It is an intrinsic part of all development interventions.

For most developing countries, climate change adds another layer of complexity to existing development challenges, such as high levels of poverty and inequality, rapid population growth, underdeveloped markets, poor infrastructure and service provision, weak governance systems. Development interventions must help individuals and communities to adapt to the interaction of these new and old pressures. Since change is a constant, sustainable interventions can only be achieved if people can adapt them in the future to changing conditions.

Adaptive capacity is understood as the ability of individuals and societies to anticipate, deal with, and respond to change – both changing climate and development pressures – while maintaining (or improving) their wellbeing. Africa Climate Change Resilience Alliance – a consortium of development organizations – described and focused on five dimensions that are considered to contribute to adaptive capacity: the asset base (including physical and non-physical assets), institutions and entitlements, knowledge and information, innovation, and flexible forward-looking decision making and governance.

## 3.2 The UNIDO approach to the implementation of the GEF Adaptation to Climate Change Programme

The GEF Adaptation to Climate Change Programme consists of two distinct funds. The Least Developed Countries Fund is designed to support projects addressing immediate adaptation needs of such countries by focusing on reducing the vulnerability of sectors and resources that are central to human and national development, such as water, agriculture and food security, health, disaster risk management and prevention, and infrastructure, as identified and

prioritized in National Adaptation Programmes of Action. The Special Climate Change Fund was established to finance activities, programmes and measures relating to climate change that are complementary to those funded by the resources allocated to the Climate Change Focal Area of the GEF Trust Fund and by bilateral and multilateral funding. As one of the ten agencies through which countries can access GEF funds, UNIDO will assist its member states to obtain grants under the GEF Adaptation Programme.

UNIDO integrates adaptation to climate change into its activities by expanding its value chain approach to encompass consideration of the effects of climate change on industrial operations. It is imperative that climate change is treated as a factor in UNIDO's agro-value chain analyses, each stage in such chains being reviewed to identify areas at risk and consequently to recommend interventions to reduce vulnerability.

As developing countries are increasingly diversifying their economies and developing industrial sectors, it is vital that these are made resilient to the potentially adverse impacts of climate change such as rising sea levels, salinization of groundwater in coastal areas, and ocean acidification. Crop failures and rising food prices also jeopardize food security in developing countries. There is an urgent need to build resilience especially in areas related to agro-value chains to benefit not only rural poor, but also growing populations who have lost their links to the land and the ability to grow their own food.

One project recently submitted to the GEF aims to help rural communities in Western Uganda to better adapt to the effects of climate change by acquiring the skills needed to engage in banana value addition activities. Apart from contributing to the food security of local communities, the project will create new income generation opportunities and thereby help reduce poverty. Another UNIDO pipeline project focuses on water resource management in Pakistan's Sialkot District. While the main target is the leather industry, a major player in the local economy and an industry with a very high water demand, the project will also promote integration into urban and rural development of affordable technologies for water treatment and conservation as well as water retention and flood management measures.

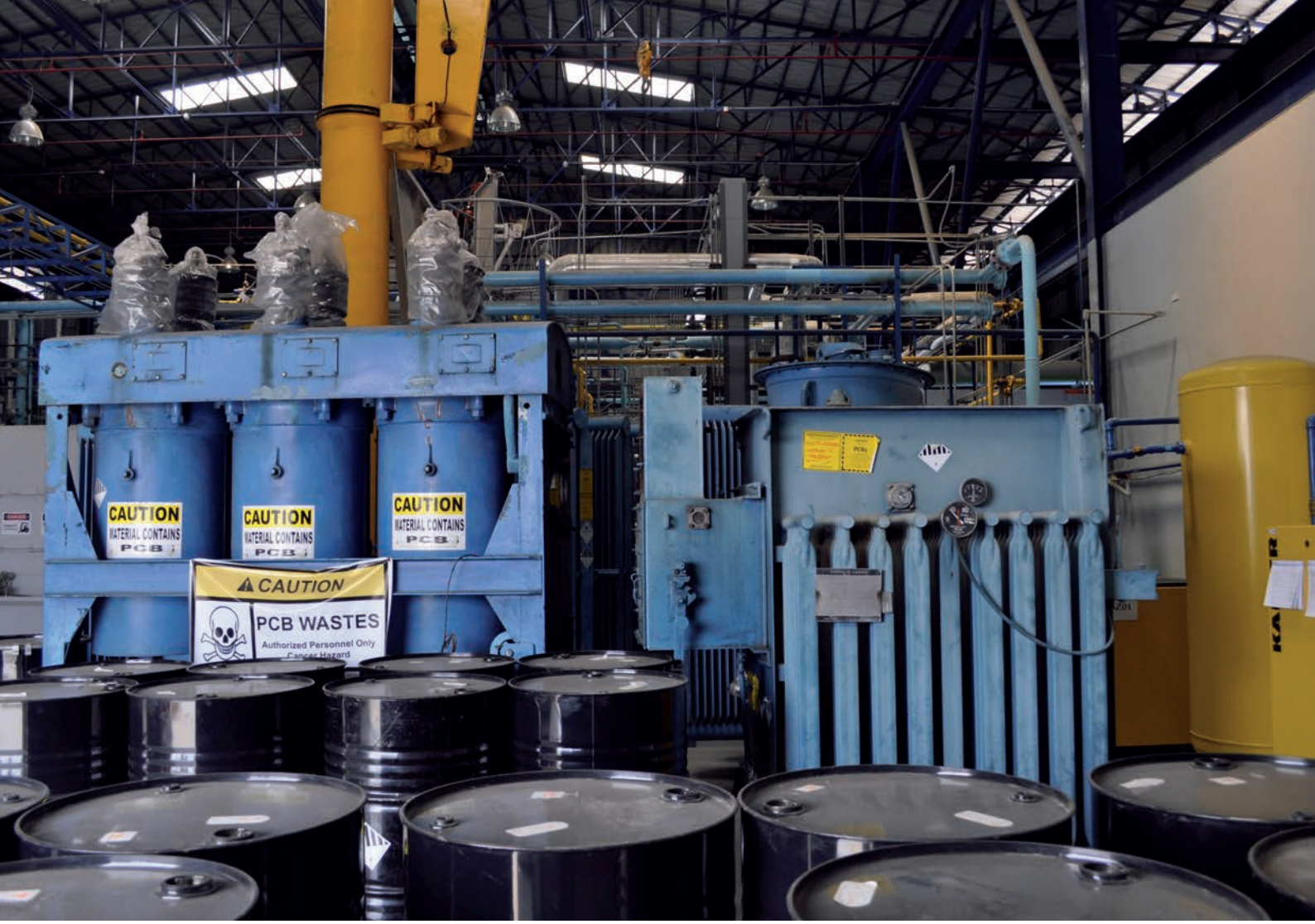
### 3.3 UNIDO's climate change approaches in GEF-6

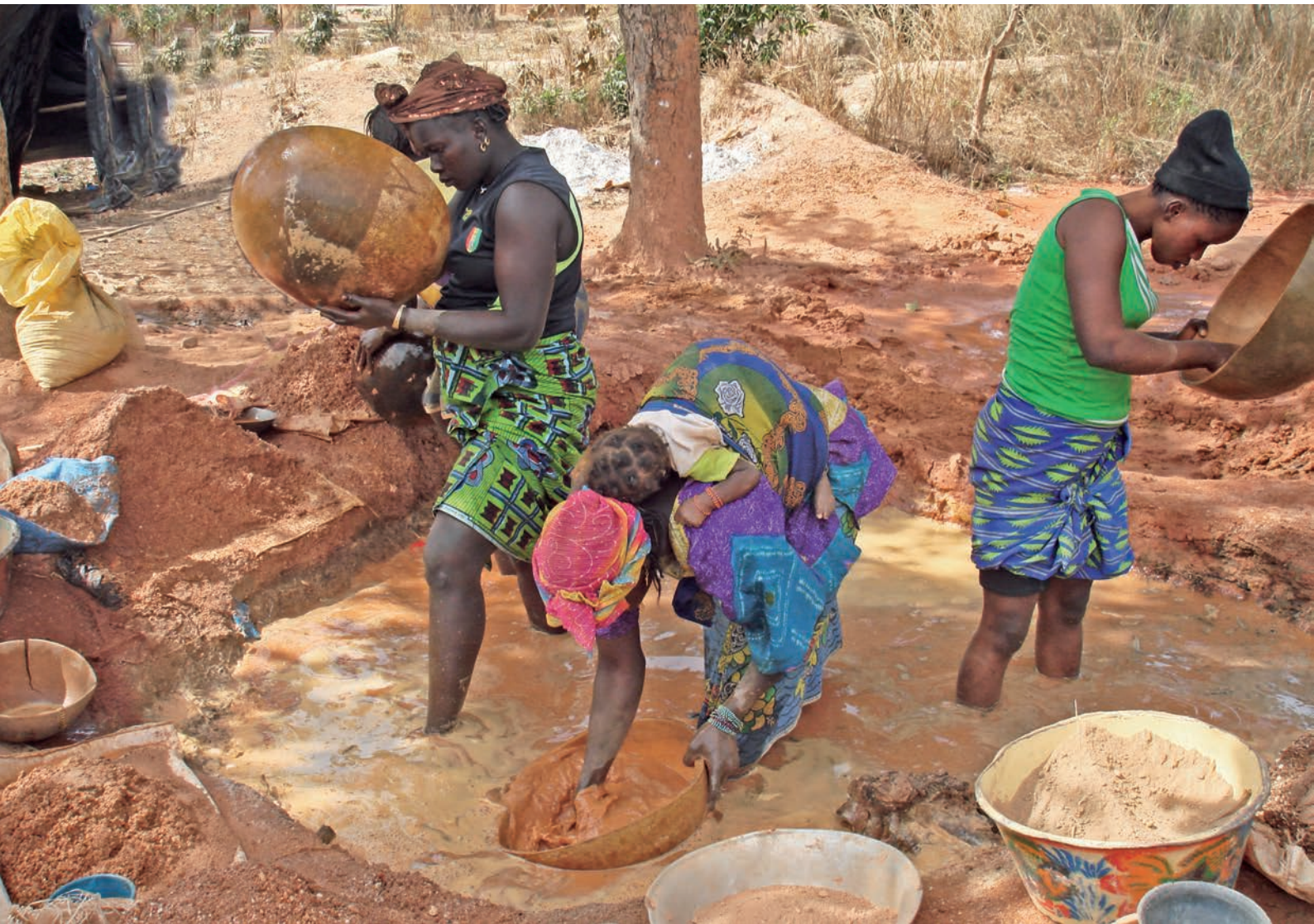
UNIDO has extensive experience in agro-value chain development, including addressing issues related to agro-waste utilization for sustainable environmental management of value chains and natural resources. UNIDO also addresses food and nutrition security concerns by reducing post-harvest losses through processing and creating off-farm activities, which enable the poor and vulnerable to earn additional income for purchases of food they would not usually produce.

In GEF-6, UNIDO will therefore be a strategic implementing agency for projects under the new GEF integrated approaches: "Commodities" and "Food Security."

Under the GEF-6 cycle, UNIDO proposes to develop projects focused on three categories of climate sensitivities:

- industrial activities dependent on climate-sensitive resources;
- industrial activities vulnerable to climate change; and
- climate-sensitive markets.


CAUTION
MATERIAL CONTAINS
PCB
CAUTION
MATERIAL CONTAINS
PCB
CAUTION
MATERIAL CONTAINS
PCB
CAUTION
PCB WASTES
Authorized Personnel Only



# 4. Chemicals and waste

## 4.1 Green Industry for sustainable development

Through the **Green Industry Initiative,** UNIDO helps developing countries to achieve inclusive and sustainable industrial development in response to growing economic, social and environmental pressures. This is achieved, inter alia, through the adoption of resource-efficient and cleaner production techniques, clean technologies, national strategies and initiatives, as well as the implementation of multilateral environmental agreements. The ultimate goal is to create jobs while protecting the environment through the promotion of sustainable patterns of production.

Simply defined, Green Industry is industrial production and development that does not come at the expense of the health of natural systems or have adverse effects on human health. Green Industry is aimed at mainstreaming environmental, climate and social considerations into the operations of industrial enterprises worldwide through a set of immediately actionable and crosscutting approaches that take advantage of emerging industry and market forces. Green Industry involves a two-pronged strategy to decouple economic growth and job creation from the unsustainable use of natural resources and negative environmental impacts. These two components are:

**Greening of existing industry**
Enabling and supporting all industries, regardless of sector, size or location, to improve the environmental performance of their operations, processes and products by various means, such as using resources more efficiently, expanding the use of renewable energy sources, phasing out toxic substances, and improving occupational health and safety.

**Creating and expanding green industries**
Establishing and developing global industries that deliver environmental goods and services. These include industries active in material recovery, recycling, waste treatment and management, as well as providers of environmental and energy consulting services, such as energy service companies and companies that render monitoring, measuring and analysis services.

**Green Industry Platform**
The Green Industry Initiative is scaled up and mainstreamed through the Green Industry Platform, jointly run by UNIDO and the United Nations Environment Programme (UNEP). The Platform provides a framework bringing together nearly 200 leaders from government, business and civil society around a set of common engagements in order to secure concrete commitments and mobilize action in pursuit of core Green Industry policies and practices.

**Benefits of Green Industry**
There are multiple benefits from pursuing a Green Industry approach. These may include reduced raw material costs, increased security of supply, reduced pollution risks and costs, lower cost of capital, a higher level of employee satisfaction and commitment, increased awareness of emerging smart technologies, enhanced innovation capacity and skills, and improved brand recognition and competitive positioning in global markets. At the enterprise, national and global levels, Green Industry offers a practical pathway to long-term economic growth and inclusive and sustainable industrial development.

**Relationship with the Green Economy and sustainable development**
Like the Green Economy concept, Green Industry is an important means of achieving sustainable development. While the goal of Green Economy is achieving improved human well-being and social equity while simultaneously reducing environmental risks and mitigating ecological scarcities, Green Industry transforms manufacturing and allied industry sectors by introducing more efficient, productive and responsible uses of raw materials to contribute more effectively to the sustainable development of industry; ultimately, Green Industry is about doing more and better with less.

### 4.2 Environmental management flagship programmes

UNIDO assists countries in capacity building for the implementation of relevant multilateral environmental agreements, such as the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury, and the Montreal Protocol on Substances that Deplete the Ozone Layer.

There is a commitment on the part of governments that are Parties to the Stockholm Convention to implement legal, organizational, and environmental management measures, including substantive technological changes, in order to comply with Convention requirements. In addition, governments that are also Parties to the Basel and/or Rotterdam Conventions are expected to work on building "synergies" among the two/three Conventions to enhance cooperation and coordination among them to build upon and contribute to strengthening each country's capacities for sound chemical management. The production and use of POPs, as well as their presence in the biosphere, are causing serious damage to human health and the environment. UNIDO helps developing countries and countries with economies in transition to achieve compliance with the Stockholm Convention and aims to build up the capacities of developing countries to protect their populations and their environmental resources from POPs-related pollution.

In the past, UNIDO's Mercury Programme focused mainly on the artisanal and small-scale gold mining (ASGM) sector. Based on its experience and strong presence in this field, UNIDO was designated as the co-lead agency for the ASGM sector within the Global Mercury Partnership. It shares this leading role with the Natural Resources Defence Council, an NGO based in Washington, DC. As co-lead agency, UNIDO provides technical contributions and participates actively in the Minamata Convention negotiations. With the Minamata Convention on mercury now adopted and signed by many countries, the Organization has the mandate to address all the industrial applications of mercury cited in the Convention's text. Building on UNIDO's active participation in several Global Mercury Partnership areas, its Mercury Programme continues to evolve and include new areas of work. In addition to ASGM, UNIDO is now also focusing on industries where mercury is used as a catalyst, such as chlor-alkali and vinyl chloride monomer, industries which introduce mercury as part of the final product, and industries where mercury emissions are unavoidable but need to be controlled (non-ferrous metal smelting, and mercury in waste). Furthermore, UNIDO is assessing and evaluating final safe and sound storage options for recovered mercury, which will be one of the most critical and relevant elements contributing to the success of the Convention.

Finally, there is a need to phase out the production and consumption of ozone-depleting substances, which lead to the continuing degradation of human health and the natural environment. The Montreal Protocol provides a response to that need. UNIDO assists governments of developing countries and countries with economies in transition to comply with Montreal Protocol requirements.

### 4.3 Persistent organic pollutants priorities

**Post National Implementation Plan Update (NIP-Update) projects**
Following the completion of the current NIP-Update processes and reports, which focus on taking stock at a national level of new POPs listed under the Stockholm Convention, UNIDO will assist participating countries in developing specific projects addressing areas and issues prioritized in the updated NIPs.

**Promotion and demonstration of best available techniques and best environmental practices (BAT/BEP) to reduce unintentionally produced POPs (uPOPs)**
Under the GEF-6 POPs portfolio, UNIDO proposes to continue with demonstrations of such techniques and practices to reduce uPOPs releases in priority source categories as identified in the national plans, including uncontrolled/open burning of wastes (municipal, medical, agricultural residues, biomass, dumpsites/landfills, and other hazardous wastes), incineration of wastes generated by utilities and boilers fired by fossil fuels, and waste segregation and disposal. Moreover, the Organization will provide assistance in enforcement of legal/policy frameworks, transfer of innovative technologies/techniques, and adoption of best environmental practices.

Regional projects will be developed where experience and information sharing will be channelled through the BAT/BEP Forum Platform for East and South East Asia, the Regional BAT/BEP Forum for Central and Eastern Europe, Caucasus, and Central Asia, and the Gulf Cooperation Council. Private industrial sector involvement will play a significant role in providing baseline financing/investment (cash and in-kind resources) for such initiatives. Regional projects in Africa will support member countries of the Common Market for Eastern and Southern Africa, the Economic Community of West African States, and Southern African Development Community in institutional development, regulatory framework enforcement, and demonstration of innovative technologies/techniques and best practices to reduce and ultimately eliminate uPOPs releases.

Individual country projects and initiatives in this area will also be developed, taking into account the major source categories identified in the National Implementation Plans.

**Disposal of polychlorinated biphenyls (PCBs)**
Applications of non-combustion technologies for PCBs disposal, already successfully demonstrated in the Former Yugoslav Republic of Macedonia, Mongolia, and the Philippines, will be replicated in other countries where such technologies are best suited. Public and private sector partnerships in the cement industry will be explored to ensure the full engagement of locally existing waste management capabilities to maximize market-driven capacities and achieve resource efficiency.

**Environmentally sound management of sites contaminated by POPs and mercury**
Under GEF-6, UNIDO will strengthen its portfolio of projects combating contamination by POPs and mercury. The Organization's initiatives promoting the transfer of remediation technologies, such as the intervention to rehabilitate a lindane and mercury contaminated site carried out within the GEF-5 project in the Former Yugoslav Republic of Macedonia, are viewed as another priority area on the UNIDO GEF-6 agenda. The project in the Former Yugoslav Republic of Macedonia is a good example of collaboration with the national government, where commitment from various government entities ensured solid baseline financing for the GEF-funded initiative.

**Promotion of alternatives to POPs pesticides**
During the GEF-6 cycle, UNIDO will continue to promote alternatives to POPs pesticides based on the results achieved in the GEF-5 project on demonstration and promotion of non-POPs alternatives to dichlorodiphenyltrichloroethane (DDT). Projects will be developed for Africa and Asia to demonstrate cost-effective, socially acceptable, and environmentally sustainable alternatives to dependency on the use of DDT and other similar products containing persistent organic pollutants.

**Green chemistry**
UNIDO is currently planning projects related to the application and scaling up of green chemistry principles throughout the manufacturing sector. While having already achieved significant successes in the area of sustainable chemicals management through its Chemical Leasing Programme, the Organization is now moving toward supporting the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances by industry. Furthermore, pilot projects in biodegradable plastics, the use of enzyme technology in textile wet processing, and the production of organic solvents from bio-waste will soon be undertaken.

**Demonstration of an area-based eco-effective chemicals management model**
The GEF-5 pilot project on area-based eco-effective chemical management in China, which promoted cradle-to-cradle management to control and reduce the environmental impact of POPs and pursued other strategic approaches to international chemicals management, will serve as a model for replication in other regions and countries. The objective is to catalyse the integration and mainstreaming of cradle-to-cradle principles into national and regional Circular Economy and Cleaner Production programmes so that current large-scale investments can be channelled more effectively to address and curb the increasing negative impact of chemicals on the environment and human health.

**E-waste issues**
E-waste is a matter of global concern and at the same time holds potential opportunities as it contains various hazardous materials, such as mercury and cadmium, but also many valuable and precious materials, such as palladium, gold, and silver. Up to 60 elements from the periodic table can be found in a personal computer or a mobile telephone. The two-sided nature of e-waste requires well structured regulations, a well organized and managed collection, dismantling and treatment system, capable stakeholders and operators, and properly operating markets. However, even in industrialized countries, these systems are still not working properly, and collection rates are rather low. Many countries export large amounts of discarded electric and electronic devices to countries without proper e-waste management or treatment facilities. Developing countries often resort to rudimentary methods of recycling and metal recovery, which harm the environment and public health. Due to its complexity and rapid growth, e-waste is emerging as a challenging issue on national, regional and global agendas.

The overall approach of UNIDO focuses on the establishment of e-waste management strategies and policies at the national and regional levels. These include all stages of the e-waste recycling chain: design of collection schemes; establishment of sustainable business models to set up new dismantling facilities or to scale up existing facilities to operate more efficiently; and linkage of such facilities to national, regional and global downstream markets for appropriate end-processing and a high recovery rate of valuable materials.

The key elements of UNIDO's e-waste management approach are:

- policy and legislation development or enhancement;
- detailed inventory;
- design of collection, dismantling and processing schemes;
- establishment of sustainable business models and financial schemes to set up/expand national e-waste management and treatment options;
- linkage to national, regional, and global downstream markets; and
- capacity building, training, and awareness raising.

Moreover, UNIDO supports regional initiatives aimed at enhancing information exchange, knowledge sharing, and management, policy and technical discussions and fora, and at promoting South-South and North-South cooperation initiatives. The Organization has a strong international network in the field of e-waste management and participates in the Solving the E-waste Problem Initiative. It is also the lead organization for the e-waste focal area within the Global Partnership on Waste Management.

Last but not least, UNIDO has a network of international professionals to support the implementation of e-waste management projects around the globe. Furthermore, the network of National Cleaner Production Centres will help UNIDO to successfully implement the proposed projects in partnership with participating countries.

**Lead-based paint**
Lead in paint has become a major environmental and human health hazard in many developing countries. In China, lead-based paint is widely used to speed up drying time, increase durability, maintain a fresh appearance, and resist moisture that causes surface corrosion. Under GEF-6, UNIDO sees the potential to assist the Chinese government to establish a detailed inventory on production, application, import/export, emission, stockpile, and contaminated sites, which will provide the basis for China's overall lead-based paint management. Moreover, UNIDO will assist China to substitute the lead used in paint with alternative technologies and to adopt effective means of phasing out lead-based paint.

### 4.4 Mercury priorities

**National action/implementation plans under the Minamata Convention**
UNIDO is currently working with more than ten countries on various aspects of mercury management, mostly in the artisanal and small-scale gold mining sector (the largest mercury user and the main source of mercury pollution), but also in the non-ferrous metal smelting, chlor-alkali, and mercury-containing waste areas. With the Minamata Convention on mercury officially adopted, UNIDO proposes to build upon this experience and apply a more structured approach to assist countries in developing national action/implementation plans for compliance with Convention requirements. The main focus will be on hotspots in Latin America, Africa, and South East Asia. Although the projects will attempt to address all aspects of mercury pollution, these regions are characterized by extensive activities in the artisanal and small-scale gold mining sector.

**Minamata Convention Initial Assessments**
UNIDO is currently developing several Minamata Convention Initial Assessments in Latin America, Africa, and South East Asia to expedite the process of ratification in countries that have already signed the Convention. These assessments are designed to strengthen national capacity in fulfilling obligations under the Convention and promote effective and efficient implementation of its provisions. Countries that carry out these activities will be able to establish sectoral and economy-wide cost effective programs to address mercury issues.

**Transfer of cleaner and more efficient technologies to the artisanal and small-scale gold mining sector**
The use of mercury for gold extraction is an area in which UNIDO has successfully been implementing projects over the past 15 years. The Organization's strategy is to initially transfer mercury recycling techniques, and at a later stage to introduce, where feasible, non-mercury alternatives. Due to its leading role in the Global Mercury Partnership on artisanal and small-scale gold mining sector, UNIDO can rely in its interventions on a pool of highly qualified technical partners. Under GEF-6, specific areas in Latin America, Africa, and South East Asia will be proposed where such mining activities are widely spread. Emphasis will be put on least developed countries because of the strong rural development potential of a well managed artisanal and small-scale gold mining sector. UNIDO will also be involved in the development of a toolkit for the evaluation of mercury emissions.

**Chlor-alkali conversion**
UNIDO has been collaborating with Euro-Chlor, an association of chlor-alkali plant operators in Europe, on the development of a project modality to assist chlor-alkali plants around the world in switching from the mercury cell technology to a more efficient membrane technology.

Such interventions in GEF recipient countries will help eliminate mercury used in the old catalytic processes and ensure adequate management of the recovered waste stocks, while also achieving substantial energy savings. Moreover, this type of projects will be inherently based on close collaboration with the private sector, since technology transfer will be an important component, which can be partially funded through private sector co-financing investments.

**Non-ferrous metal smelting**
Zinc, lead, copper, and other metal ores often contain mercury traces in various concentrations. The smelting process releases large quantities of mercury in the fly and bottom ashes of smelters. UNIDO currently implements a pilot GEF-5 project in China to develop a management process for the zinc smelting industry. The private sector is closely involved and is providing a large share of co-financing. Under GEF-6, UNIDO proposes to expand this pilot project in China (for other metals) as well as to other countries such as South Africa, Chile, and Peru.

**Mercury in waste**
Since mercury does not degrade into other chemicals, once it is used in a process or product, it finds its way into the environment where it accumulates and causes harm to the environment and human health. Therefore, the management of wastes that contain mercury is of utmost importance. Based on pilot UNIDO GEF-5 projects currently under implementation in Mongolia and Argentina and under development in Tunisia, the Organization proposes to expand this initiative to other interested countries during the GEF-6 cycle. The involvement of the private sector is essential and UNIDO is establishing formal contacts with various companies to transfer mercury waste treatment technologies based on BAT/BEP principles.

**Vinyl chloride monomer (VCM) process conversion**
Mercury is still used in VCM production in China. As this process is inefficient and highly polluting, under GEF-6, UNIDO sees the potential to assist the Chinese government and industry in converting to cleaner technologies and in designing and implementing mercury waste management plans for the converted sites. Again, this is an area where the private sector involvement will be essential.

**Management of mercury supply and storage**
With the Minamata Convention coming into force, the issue of mercury stocks will need to be addressed immediately to avoid their use in the gold mining sector. The pilot UNIDO GEF-5 project currently under implementation in Mongolia deals with this issue; however, more demonstration projects on mercury stabilization and safe storage should be conducted as soon as possible. While this may not be the area of utmost priority under GEF-6, once the Convention enters into force, it will become the most relevant factor in the efforts to secure its success. Since mercury cannot be degraded, safe, permanent, and economically viable solutions for its storage have to be identified. UNIDO recommends that a string of GEF-6 pilot projects be undertaken at an early stage of Convention implementation to adequately build up capacities for managing and disposing of large amounts of mercury stocks.

### 4.5 ODS priorities

The Montreal Protocol on Substances that Deplete the Ozone Layer controls substances such as hydrochlorofluorocarbons, chlorofluorocarbons and methyl bromide. The Protocol has its own funding mechanism to promote phase-out activities in developing countries listed in Article 5 of the Protocol. However, the GEF provides support to parties with economies in transition that are still classified as non-developing countries and therefore are not eligible for financing by the Montreal Protocol Multilateral Fund. The GEF Council decided to support these countries in their effort to meet their Montreal Protocol obligations. The proposed GEF-6 ODS strategy provides the opportunity to broaden the scope of initiatives by extending assistance to Article 5 countries.

The initiatives outlined below cover strategic areas and themes that will remain or become priorities under the GEF-6 cycle for UNIDO technical cooperation and assistance projects related to the Montreal Protocol.

**Initiative for implementing HCFCs phase-out management plans**
This initiative will focus on the elimination of hydrochlorofluorocarbons (HCFCs) in countries with economies in transition. A key element to be addressed is to assist countries in complying with their Montreal Protocol obligations.

The tasks will include development of strategies, policies and legislations for the regulation of production, consumption, import and export of ODS. Institutional strengthening and capacity building activities will give countries greater support in the sustainable elimination of ODS and in meeting Montreal Protocol phase-out targets. Moreover, this will include the provision of equipment working with non-ODS, low global warming potential alternatives, and adequate training to government representatives and other relevant stakeholders on legislation, technology, good refrigeration practices, and industrial safety.

An on-going project in the Russian Federation (assistance to the foam sector and HCFC refrigeration servicing sector) will be scaled up under the GEF-6 cycle. This will result in the final phasing out of HCFCs. It will improve practices in the service sector and will generate further improvements in demand-side energy efficiency in refrigeration and air-conditioning systems resulting in significant reductions of direct ODS emissions as well as reductions in greenhouse gas emissions. Additionally, the GEF-5 projects on the initiation of the HCFCs phase-out in Azerbaijan and on the introduction of ODS alternatives in agriculture and the post-harvest sector in Kazakhstan help these countries to start meeting their obligations under the Montreal Protocol. A continuation of these efforts under GEF-6 will assist Kazakhstan, Belarus, Ukraine, and other Article 2 countries in implementing their HCFCs phase-out management plans.

**Initiative for additional climate benefits in the refrigeration service sector**
This initiative is related to energy efficiency components linked to the replacement of HCFCs-based installations and introduction of alternatives with low global warming potential (GWP). By promoting advanced non-ODS technologies with low GWP, UNIDO is supporting recipient countries in achieving Montreal Protocol targets with additional climate benefits (reductions of direct and indirect greenhouse gases). Pilot projects for Vietnam and Gambia have been approved by the GEF under the GEF-5 cycle, and UNIDO proposes to undertake similar projects in other countries and regions under GEF-6.

**Initiative for coordinated management of ODS and POPs waste disposal**
This initiative aims to conduct a number of complementary activities designed to generate a robust framework and methodology for dealing with POPs and ODS destruction on a regional basis. Such activities will create synergies for the implementation of both the Montreal Protocol and the Stockholm Convention and will demonstrate the operation of destruction facilities as an innovative approach to integrated chemical waste management.

Under GEF-5, a regional project has been developed by UNIDO for the Russian Federation, Ukraine, Belarus, Kazakhstan and Armenia. During the GEF-6 cycle, this project can be expanded to cover other neighbouring countries, such as Kyrgyzstan and Tajikistan.

# 5. International waters

UNIDO makes a significant contribution by supporting its member states and GEF recipient countries in their efforts to reduce detrimental industrial impacts on the environment, and to manage effectively national and trans-boundary water bodies suffering from industrial pollution. Given its experience and leading role in addressing issues related to international waters, the Organization was appointed by UN-Water as lead agency in the preparation of the Fifth World Water Development Report, which focuses on the water-energy nexus. While capacity building is at the centre of UNIDO's work under this GEF focal area, the Organization complements the theoretical knowledge transferred to GEF recipient countries with pilot demonstrations and technical assistance on policy and regulatory issues to ensure the sustainability of project benefits. As the specialized agency of the United Nations with the mandate to promote inclusive and sustainable industrial development, UNIDO is also well placed to catalyse the active engagement of the private sector through partnerships.

UNIDO interventions are crosscutting in their nature; they create synergies and offer multiple benefits and integrated solutions across the proposed core programmes of the GEF-6 international waters focal area strategy. For example, UNIDO's Transfer of Environmentally Sound Technologies (TEST) projects address issues related to the water/food/energy/ecosystem security nexus as well as help reduce ocean hypoxia. Similarly, UNIDO's large marine ecosystem projects help reduce ocean hypoxia, prevent the loss and degradation of costal areas, and rebuild global fisheries. By creating synergies among these different areas, the Organization is able to significantly increase the impact of its interventions.

### 5.1 Reducing ocean hypoxia

UNIDO's efforts to reduce ocean hypoxia are focusing on the prevention of land-based pollution affecting the marine environment. Industries are often located along river systems to satisfy their production needs. Industrial effluents are discharged into the same river systems and are transported by the surface water flow to be finally discharged into the seas. Industrial sectors generating effluents rich in organic substances are numerous and include – but are not limited to – food and beverage, pulp and paper, and the textile industries. The cumulative discharges of industrial effluents lead to excessive nutrient loads reaching the seas and the creation of hypoxia zones.

The Organization's approach to excessive nutrient discharges by industries is centred on integrated and sustainable industrial development based on resource efficiency. Building capacities and providing technical assistance for the efficient use of resources, including water, energy and raw materials, is the key to sustainability. Reduced resource consumption will decrease the excessive pressure on the environment, improve the management of locally scarce resources, and contribute to the prevention of conflicts between competing resource users. As a consequence, UNIDO's initiatives will contribute to securing the supply of water, food and energy, as well as the long-term sustainability of ecosystems, thus generating global environmental benefits.

At the river basin level and in terms of water technologies, UNIDO has applied its TEST approach in various countries in Africa, Asia, Eastern Europe, and Latin America. This integrated approach reduces resource consumption and industrial effluent discharges while improving the competitiveness of SMEs and industries. It combines the transfer of water management technologies with the introduction of management tools (Corporate Social Responsibility, Environmental Management and Environmental Accounting Systems), thus addressing all key aspects of a company's operations.

Improved water efficiency, water recycling and reuse are demonstrated in companies active in water-intensive industries. Hazardous substances used during production processes are replaced by more environmentally friendly substances, thus reducing the pollution load discharged into surface water bodies. The success of the TEST methodology led to the recent endorsement of the new SWITCHMed programme (Switching towards More Sustainable Consumption and Production Patterns in the Mediterranean) by the European Commission. With UNIDO as the lead implementing agency of the Demonstration and Networking components, the project will assist countries of the Southern Mediterranean region.

UNIDO's GEF TEST projects are focusing on resource efficiency, with water being one of the main resources. Moreover, companies participating in these demonstration projects also reduce significantly their emissions of greenhouse gases as well as their solid wastes, thus generating global environmental benefits under multiple focal areas. One notable example is the UNIDO GEF-5 Save the Source concept recently approved to be implemented in Russia. This is a project under the international waters and climate change and land degradation focal areas, which aims at greening the supply chain in the water-intensive beverage sector. Additionally, UNIDO is currently applying the TEST integrated approach in its COAST project, which focuses on introducing resource efficiency measures and practices in the costal tourism industry.

Finally, the Hot Spot and TEST integrated methodologies are ideal tools for the development of Trans-Boundary Diagnostic Analyses and the implementation of Strategic Action Programmes when land- based industrial activities are identified as one of the major sources of pollution in international water bodies. The TEST methodology could be systematically applied in the target sectors of GEF recipient countries under the GEF-6.

### 5.2 Large marine ecosystems

In projects aiming to protect large marine ecosystems, the beneficiaries of UNIDO's interventions are usually SMEs and riparian communities as well as countries sharing large marine ecosystems. UNIDO has been entrusted by the GEF to implement such projects in the Gulf of Guinea, where the Organization assisted 16 West African countries, and in the Gulf of Mexico, a project about to go into Strategic Action Programmes implementation. Both projects have pursued the long-term development goals of (i) recovering and sustaining depleted fisheries; (ii) restoring degraded coastal areas; and (iii) reducing land and ship-based pollution by relying largely on regional capacity building. Under the GEF-6 cycle, UNIDO will continue to support recipient countries and will aim at developing complementary projects based on the results and lessons learned from completed projects.

### 5.3 Industrial pollution of groundwater resources

Pursuing the GEF objective to enhance multistate cooperation and catalyse investments to balance competing water uses in the management of trans-boundary surface and ground waters, and in response to the evolving climatic conditions and increased frequency of extreme weather events, UNIDO will focus on interventions that not only increase the resilience of communities to climate change through the introduction of sustainable water management practices and techniques, but also help to prevent disasters in industrialized areas located in low-lying coastal and delta regions. The Organization stands ready to assist countries in their efforts to prevent industrial spills and leakages and generally to protect and remediate groundwater resources and generate global environment benefits.

**CONTACT DETAILS**

**For information, please contact:**

UNIDO GEF Coordination
Tel: +43-1-26026 3793/3647
E-mail: GEF@unido.org

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna International Centre · P.O. Box 300 · 1040 Vienna · Austria
Tel.: (+43-1) 26026-0 · unido@unido.org
www.unido.org