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# Sustainable Cities

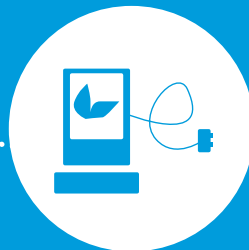
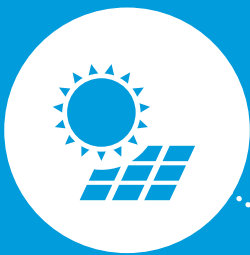
Hubs of Innovation, Low Carbon  
Industrialization and Climate Action



INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT



SUSTAINABLE CITIES:  
PLATFORMS FOR LOW CARBON  
INDUSTRIALIZATION AND TURNING  
TODAY'S CITIES INTO LIVABLE  
ECONOMIC POWERHOUSES





# Sustainable Cities

## Hubs of Innovation, Low Carbon Industrialization and Climate Action

### Background

Sustainable and inclusive industrialization of cities provides opportunities for developing synergies, such as decoupling economic growth from environmental degradation, while at the same time creating employment and fostering clean energy innovation. Cities benefit from the role of industries in local economic development through job creation and income generation. In industry also lie critical solutions towards limiting the carbon intensity of growth, considering the impacts of its activities as an energy consumer (and in some cases energy producer), major freight transport user, promoter of efficiency and clean energy technologies and solutions, preserver of green cover and implementer of sustainability initiatives. A sustainable city serves the best interests of industry as it benefits from the efficient and peaceful functioning of its host cities.

A SUSTAINABLE  
CITY SERVES THE  
BEST INTEREST  
OF INDUSTRY

### UNIDO's comparative advantage:



As the world continues to urbanize rapidly, the importance of shaping sustainable cities has begun to receive widespread recognition. This is particularly true in developing countries where urban growth is relatively high and the existing systems and infrastructure are not sufficient. Estimates show that more than half of the global population currently live in cities, and is expected to reach two-thirds by 2050. This global megatrend of accelerated urbanization, while bringing greater opportunities for growth and human well-being, will increase the inter-relations between cities and climate change. Cities are now the main sources of global greenhouse gas emissions, responsible for 80% of global CO<sub>2</sub> according to UN-Habitat, while cities are the very ones most vulnerable to climate change. The rapid urbanization will bring more carbon emissions to cities and induce increased urban dwellers, who will be more frequently exposed to climate risks.

Yet cities, if designed towards sustainability, have high potential to prevent and resolve the climate problems and contribute to human prosperity as cities can move quickly to implement locally viable solutions. Cities have their own local contexts (local infrastructure, culture, institutions and knowledge) and provide space to incubate new green technologies as socio-technical experiments can be carried out for **clean energy innovation** via observing and analyzing the interactions among technologies, users, infrastructure and institutions at city scale. The technology demonstration can shape the frontline for larger green innovation by being replicated and scaled up later.

**CITIES BENEFIT FROM THE ROLE OF INDUSTRIES IN LOCAL ECONOMIC DEVELOPMENT THROUGH JOB CREATION AND INCOME GENERATION**

Cities can also efficiently tackle climate change through city networks by sharing knowledge and encouraging participation in **climate action**. Unlike national governments, each of which have different interests that may conflict, local governments are more free from military, economic, diplomacy and historical issues, which makes it easier to establish transnational city networks for collective climate action. The city network can more proactively respond to climate change by encouraging local governments to submit the ambitious but viable carbon reduction targets aligned with their national governments' submitted Intended Nationally Determined Contributions (INDC) to United Nations Framework Convention on Climate Change (UNFCCC).

However, it is recognized that designing sustainable cities is a challenging task. Sustainable cities cannot be achieved by one particular organization as it requires comprehensive and integrated knowledge. Having considered this, UNIDO seeks for cooperation with other players such as private companies, governments and research institutes to complement knowledge and promote integrated nexus approaches. Meanwhile, UNIDO also focuses on urban transport, energy and industries to take advantage of the specialties of UNIDO and maximize the impacts of interventions. According to World Bank (2012), urban transport produces around 23% of the global CO<sub>2</sub> emissions. Also, a research conducted by IEA (2009) revealed that more than 80% of the new energy demand will come from the cities in developing countries. Thus transforming urban transport and energy systems can bring high impacts in coping with climate change.

Furthermore, UNIDO, as a specialized UN agency for industry, promotes Inclusive and Sustainable Industrial Development (ISID) for urban sustainability. Although industry is a key engine of economic growth, the industry sector has been overlooked in sustainable cities as it consumes a large amount of energy and produce high carbon emissions. However, economic growth, supported by industry, is one of the three pillars of sustainability which requires greater consideration. In this regard, low-carbon industries **can empower city economy** and provide solutions for decoupling economic growth from carbon emissions, while at the same time creating **green jobs for youth employment**. It is particularly urgent for the pre-industrialized countries to guide the path towards **low-carbon industrialization**.

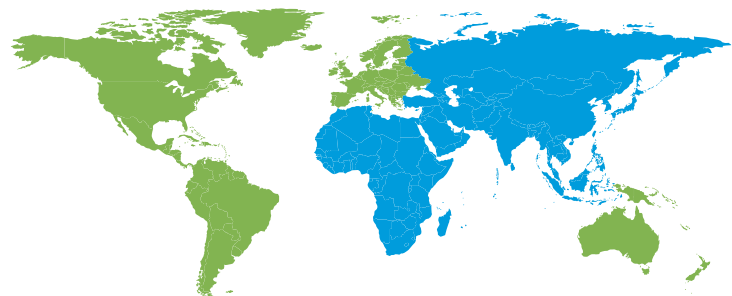
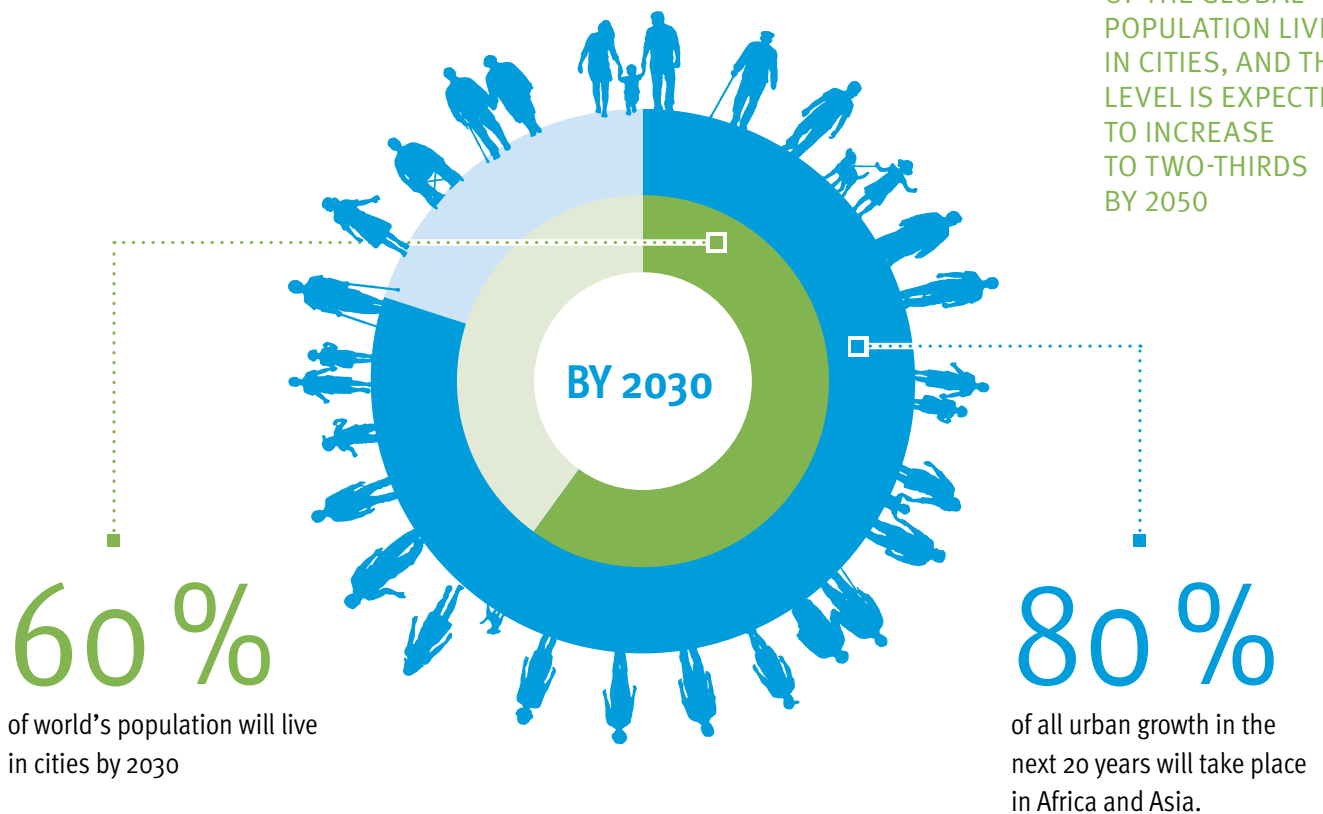
Finally, UNIDO's work on sustainable cities to design cities as hubs of clean energy innovation, low-carbon industrialization and climate action also supports the Sustainable Development Goals (SDGs) and the 2030 Agenda: SDG 7 (affordable and clean energy), SDG 9 (industry, innovation and infrastructure) and SDG 11 (sustainable cities and communities). UNIDO hopes to see sustainable cities that can contribute to people, planet and prosperity for our future generations.

# URBANIZATION

## THE EVIDENCE OF CHANGE<sup>1</sup>

Almost two-thirds of the world's population will reside in cities by 2030. Urbanization is creating significant opportunities for social and economic development and more sustainable living, but also exerting pressure on infrastructure and resources, particularly energy.

MORE THAN HALF OF THE GLOBAL POPULATION LIVES IN CITIES, AND THIS LEVEL IS EXPECTED TO INCREASE TO TWO-THIRDS BY 2050



1. Table adapted from UN Habitat

# UNIDO services linked to sustainable cities

The development of sustainable cities requires integrated interventions in sustainable planning, sustainable investment, and sustainable technologies. In line with its mandate of Inclusive and Sustainable Industrial Development (ISID), UNIDO plays a lead role in the promotion of sustainable technologies for sustainable cities through its Global Forums and large portfolio of technical cooperation projects around the world.

## UNIDO'S INTERVENTIONS

### THEMATIC STREAMS



#### CLIMATE RESILIENT INDUSTRIES (hosted by cities)

- Industrial energy efficiency (IEE) & renewables for industrial applications
- Green supply chains / Green Freight influenced by Industrial Parks & Clusters
- Disaster Risk Reduction through resilient energy systems and air quality management



#### CLIMATE SMART CITY SERVICE DELIVERY

- Energy Management System (ISO 50001) in cities
- Efficient and low carbon waterworks, transport, buildings, city services
- Smart grids
- Smart waste refineries



#### VALUE CHAIN DEVELOPMENT FOR SUSTAINABLE CITIES

- New energy vehicles
- Sustainable building materials
- Clean Fuels
- Climate-smart peri-urban agriculture (greening the food value chain)

### DEVELOPMENT INTERVENTIONS



#### DRIVING GREEN TECHNOLOGY INNOVATIONS AT CITY SCALE

- Urban mobility, energy and resource efficiency systems
- Creating innovations by learning: implementing pilot demonstrations and fostering innovations via replications and scaling up based on lessons learnt
- Fostering green value chains and supporting micro, small and medium-sized enterprises (SMEs)



#### ESTABLISHING CLIMATE RESILIENCE IN URBAN PLANNING AND MANAGEMENT

- Integrating climate risks and sustainability options in urban planning and management
- Capacity building for evidence based urban planning action
- Improving the urban institutional framework at national level to provide systemic approaches on urban planning and development by harmonizing various sectoral policies



#### PROMOTING URBAN INCLUSIVENESS

- Shared benefits of low carbon industrialization:
- Integrated and inclusive approach towards urban planning and management
- Gender equity: How can we promote gender and youth issues in the practice of sustainable cities?



#### INCREASING PARTNERSHIP WITH DIVERSE ACTORS AND DEVELOPING CITY NETWORKS

- Exploring innovative finance mechanisms for cities by drawing private sector, national government and other possible funding sources
- Knowledge management by reflecting various perspectives from research institute, civil society, NGO, private sector and city government
- Community engagement for increasing awareness and enhancing capacity of civil society to secure social inclusion

**Intervention 1: Driving green technology innovations at city scale**

**Urban mobility, energy and resource efficiency systems**

UNIDO through its global forums and technical cooperation projects takes a lead role in the promotion of sustainable technologies to complement the ongoing work of programme partners on sustainable planning and investment.

The utilization of green technologies such as renewable energy that generate green electricity, smart grid systems that connect the electric vehicle charging stations to the grid to efficiently supply electricity, and electric vehicles that reduce carbon emissions sharply by using green electricity, ensure the highest impact for city-level climate action and fosters green development as well as innovation.

**Creating innovations by learning: implementing pilot demonstrations and fostering innovations via replications and scaling up based on lessons learnt**

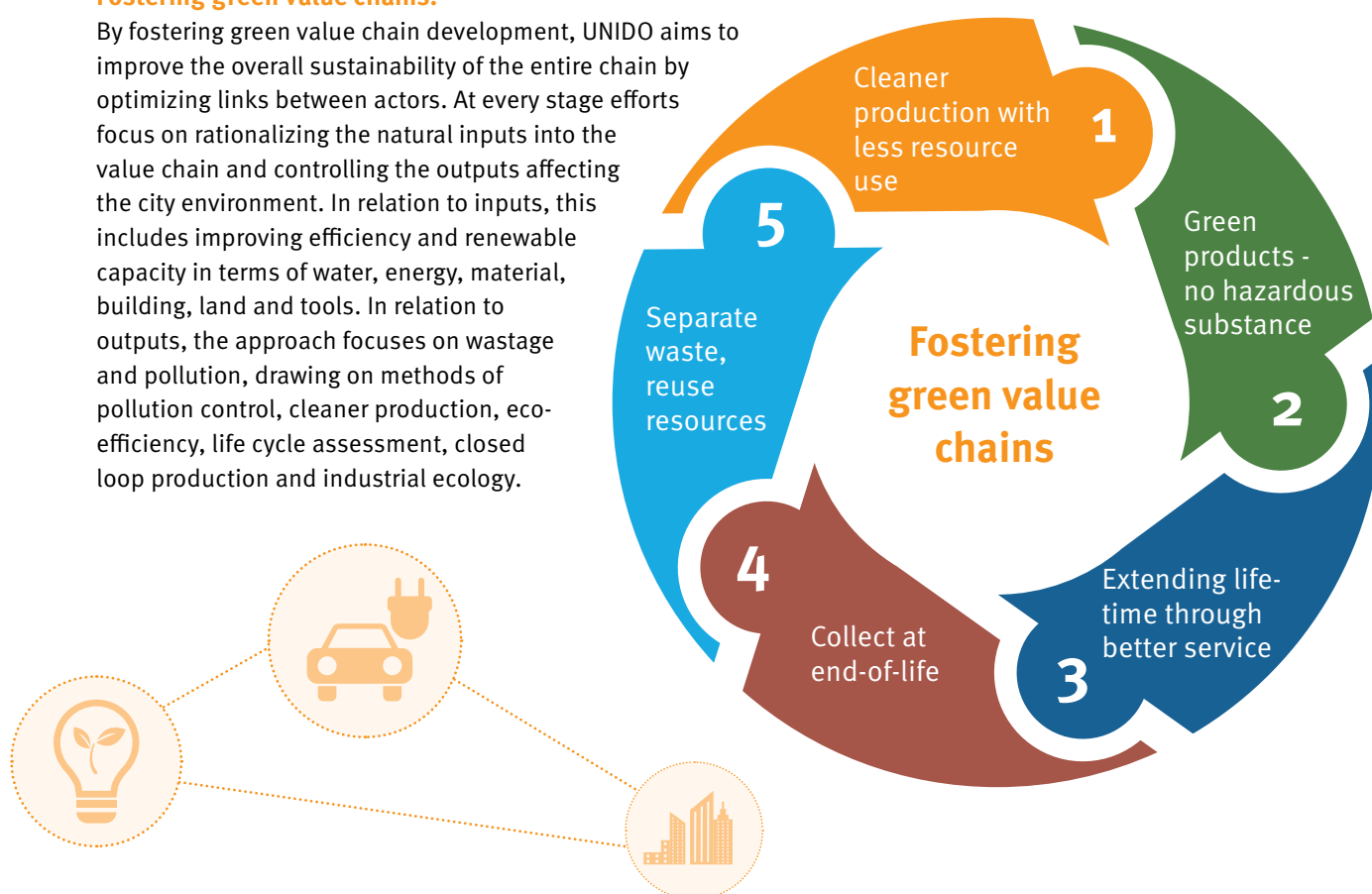
Through the demonstration projects, UNIDO showcases techno-economic feasibility of technologies available for increasing energy security and reducing environmental impacts and paves the way for clean energy innovation, decreasing costs of mitigating measures, and, future replication and scale-up.

At the city level, UNIDO demonstration projects are strategically integrated into mixed use city neighborhoods, in order to produce not only better economic performance but create easily accessible and safe working environments, healthy surrounding neighborhoods, and no negative impacts on the natural environment.

**Fostering green value chains:**

By fostering green value chain development, UNIDO aims to improve the overall sustainability of the entire chain by optimizing links between actors. At every stage efforts focus on rationalizing the natural inputs into the value chain and controlling the outputs affecting the city environment. In relation to inputs, this includes improving efficiency and renewable capacity in terms of water, energy, material, building, land and tools. In relation to outputs, the approach focuses on wastage and pollution, drawing on methods of pollution control, cleaner production, eco-efficiency, life cycle assessment, closed loop production and industrial ecology.

FOSTERING GREEN VALUE CHAIN DEVELOPMENT IMPROVES THE OVERALL CITY SUSTAINABILITY





**Intervention 2:****Establishing climate resilience in urban planning and management****Integrating climate risks and sustainability options in urban planning and management**

For a successful path towards sustainable city development, there is a great need for the integration of climate resilience into urban planning and management.

The starting point for establishing climate resilience requires a city to understand its exposure and sensitivity to a given set of impacts, and develop responsive policies and investments that address these vulnerabilities. With an introduction of climate change assessments, such as risk and vulnerability mapping, understanding of city-specific climate change impacts is improved and key inputs to urban planning and formulation of policies and programmes on sustainable city development are provided.

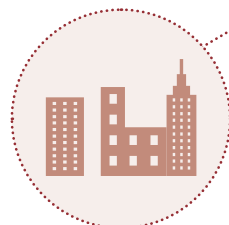
**Capacity building for evidence based urban planning action**

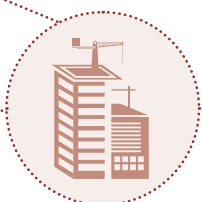
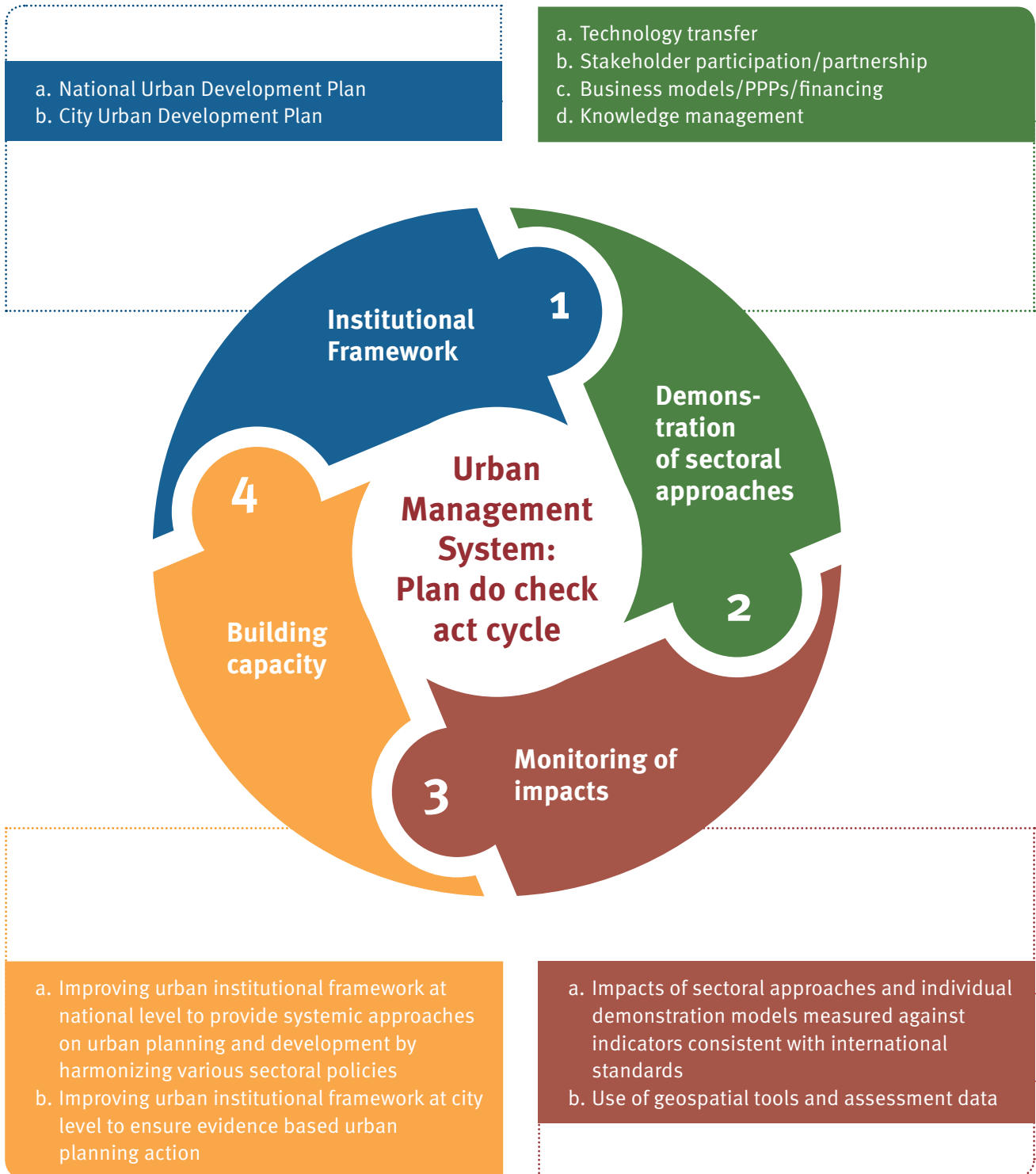
UNIDO provides technical assistance to countries in terms of developing institutional capacities required to integrate climate risks and sustainability strategies into urban planning and management based on the outcomes of relevant climate change assessments. Through targeted capacity building activities and training programmes for decision makers on measurement, reporting, and verification of climate change mitigation and adaptation efforts, transition from planning to evidence based urban planning action is ensured.

**Improving the urban institutional framework at national level to provide systemic approaches on urban planning and development by harmonizing various sectoral policies**

Establishing climate resilience in urban planning and management requires collaborative problem solving and coordination across sectors. Climate change will have impacts on many sectors: residential, industry, transportation, public health, water management, waste, and energy. Through a multi-sectoral approach, as well as improvement of urban institutional framework at national level, UNIDO supports systemic approach on urban planning and development by harmonizing various sectoral programs.

**TECHNICAL ASSISTANCE TO COUNTRIES  
IN DEVELOPING INSTITUTIONAL  
CAPACITIES TO INTEGRATE CLIMATE  
RISKS AND SUSTAINABILITY STRATEGIES  
INTO URBAN PLANNING.**





### Intervention 3: Promoting urban inclusiveness

#### Shared benefits of low carbon industrialization:

While industrialization leads to economic growth and empowerment, it should benefit all sectors of society. Industrialization should create decent job opportunities with reasonable payment and good working conditions so that the benefits of growth are shared more widely.

INCLUSIVENESS,  
FAIRNESS AND  
GENDER EQUALITY  
ARE CRUCIAL

UNIDO embraces this challenge through prioritizing inclusive and sustainable industrial development, and taking a lead role in integrating low carbon industrial development within the cities context for shared economic empowerment. Within this intervention, UNIDO works with a wide range of partners, stakeholders and beneficiaries in order to realize the benefits of this vision for the next era of sustainable city development.

#### Integrated and inclusive approach towards urban planning and management:

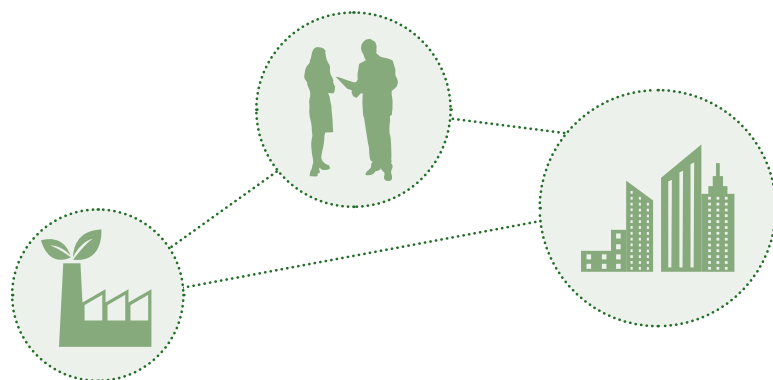
UNIDO promotes an integrated approach towards urban sustainability that is guided by an evidence-based, multi-dimensional, and broadly inclusive planning process that balances economic, social and environmental resource considerations.

Recognizing the unique window of opportunity that comes with rapid urbanization, UNIDO seeks to promote the creation and implementation of comprehensive sustainability planning and management initiatives. It will primarily do so by supporting local strategic planning processes and implementation efforts in selected cities and countries. To the maximum extent possible, local challenges addressed by this work—designed to promote improved livability and environmental conditions—will be linked to global challenges, such as climate change, biodiversity, water resources, waste, land degradation, and more.

#### Gender equity: How can we promote gender issues in the practice of sustainable cities?

Social dimensions such as inclusiveness, cultural adequacy, fairness and gender equality are crucial, besides dimensions related to the economy, ecology, built environment and policy. UNIDO sees the empowerment of women not only as a responsibility, but foremost as an opportunity. Women's economic participation and wellbeing is crucial for a society at large given that "poverty incidence tend to be lower in countries with more gender equality".

Two aspects are vital when planning and re-organizing gender-friendly cities: safety and comfort. The safety of women has to be a priority while planning sustainable cities, as they are disproportionately subject to gender based violence and harassment are prevalent in cities. Furthermore, a crucial component of working adults' lives – for both men and women - is the comfort and support they can access in order to balance family and work life. Such comfort would include efficient access to employment, schools, childcare, storages, and health and, sanitary facilities. Moreover, the elimination of gender-based occupational segregation, gender gaps in payment and other forms of labor market discrimination, is also essential. Financial support for education, business and other training opportunities would also aid the economic empowerment of women, who are often disenfranchised from professional development opportunities.



Energy, as an integral part of sustainable urban planning, can help to make cities safer, improve sanitation and health and create sustainable transport and mobility concepts. Promoting the installation of lights and increasing security in public places can be helpful for creating a safer environment for women.

UNIDO's strategy for promoting gender equality and women's empowerment in the framework of ISID is to support the development of people-centred sustainable cities that are based on the principles of human rights, gender equality and wellbeing. The focus will be to promote the economic empowerment of women by supporting industries and enterprises to provide access to clean and affordable energy and related services such as water and sanitation, safe public transport, and lighting of streets. Furthermore, the development of information and communications technology (ICT) infrastructure could improve safety of women in cities by providing access to information. UNIDO aims to incorporate gender dimensions in urban energy projects in part by increasing women's representation, engagement and participation in decision making processes and utilizing gender expertise of women's networks and associations, NGOs and international organizations

PROMOTING  
ECONOMIC  
EMPOWERMENT  
OF WOMEN BY  
SUPPORTING  
INDUSTRIES AND  
ENTERPRISES TO  
PROVIDE  
ACCESS TO CLEAN  
AND AFFORDABLE  
ENERGY



## **Intervention 4: Increasing partnership with diverse actors and developing city networks**

### **Exploring innovative finance mechanisms for cities by drawing private sector, national government and other possible funding sources**

While UNIDO will focus on its very specific areas of intervention under the sustainable cities programme, it will aim to assist in leveraging financing and private sector investments, as well as South-South cooperation, through its technical assistance and institutions-building approaches. UNIDO will also tap into its network of experts, technical/institutional partners and other partnership platforms (such as the Green Industry Platform, Eco-cities network, Sustainable Energy Centres, Sustainable Energy for All (SE4ALL), Global Cleantech Innovation Programme (GCIIP) for SMEs, Low Carbon and Low Emission Clean Energy Technology Transfer, Climate Technology Centre and Network (CTCN)) to achieve higher impact results on the ground.

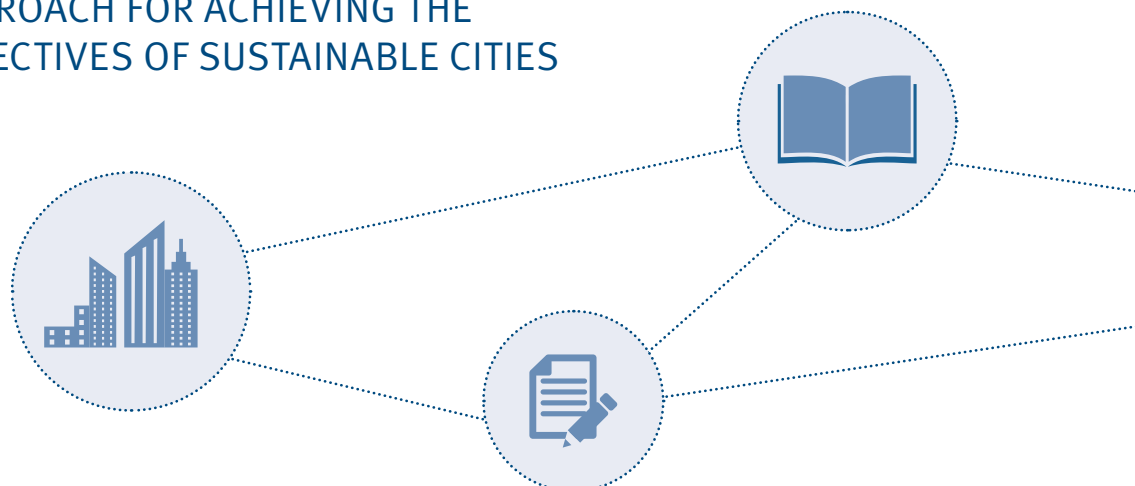
Within this intervention, UNIDO will leverage its expertise in building and enhancing municipal institutional capacity in financing sustainability and demonstrating financial and business models, including Public-Private Partnerships (PPPs), green procurement, fund management and incentive mechanism to promote sustainable city investments.

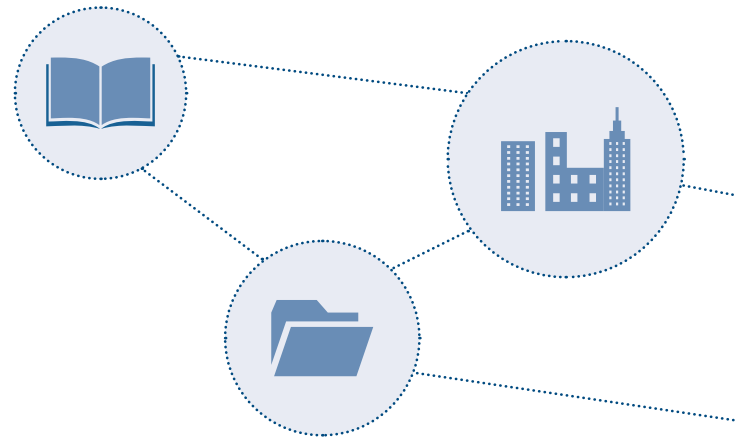
### **Knowledge management by reflecting various perspectives from research institute, civil society, NGO, private sector and city government**

Through capturing, developing, sharing, and effectively using organizational knowledge, UNIDO facilitates a multi-disciplinary approach for achieving the objectives of sustainable cities.

Within this intervention UNIDO provides a space for collaborative engagement by familiarizing cities with aspirations for sustainability and wide range of stakeholders, such as research institutes, civil societies, NGOs, private and finance sectors as well as city governments. Knowledge management products, such as websites, case studies and lessons learned briefs, reflect the various perspectives of different stakeholders and are integrated into all UNIDO interventions.

## **FACILITATING MULTI-DISCIPLINARY APPROACH FOR ACHIEVING THE OBJECTIVES OF SUSTAINABLE CITIES**



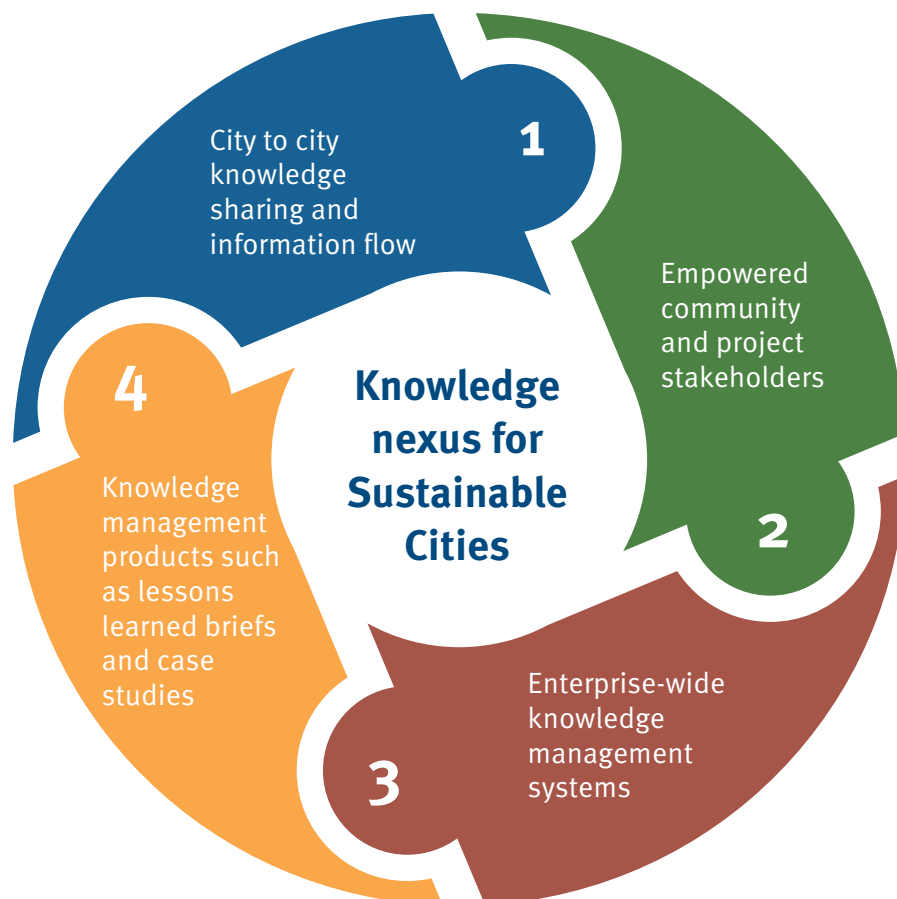


**Community engagement for increasing awareness and enhancing capacity of civil society to secure social inclusion**

Community engagement is essential for effective implementation and maintenance of city-initiated sustainability programmes. Residents are a valuable resource, offering a first-hand perspective on the strengths and weaknesses of their community. They can contribute a cross-section of diverse ideas and challenges that might otherwise be overlooked.

Thought cultivating participatory process and strong community engagement UNIDO within this intervention delivers “triple bottom line” results: sustainability that impacts economic prosperity, environmental quality and social equity.

**KNOWLEDGE MANAGEMENT AND COMMUNITY ENGAGEMENT FOR SUSTAINABLE CITIES**

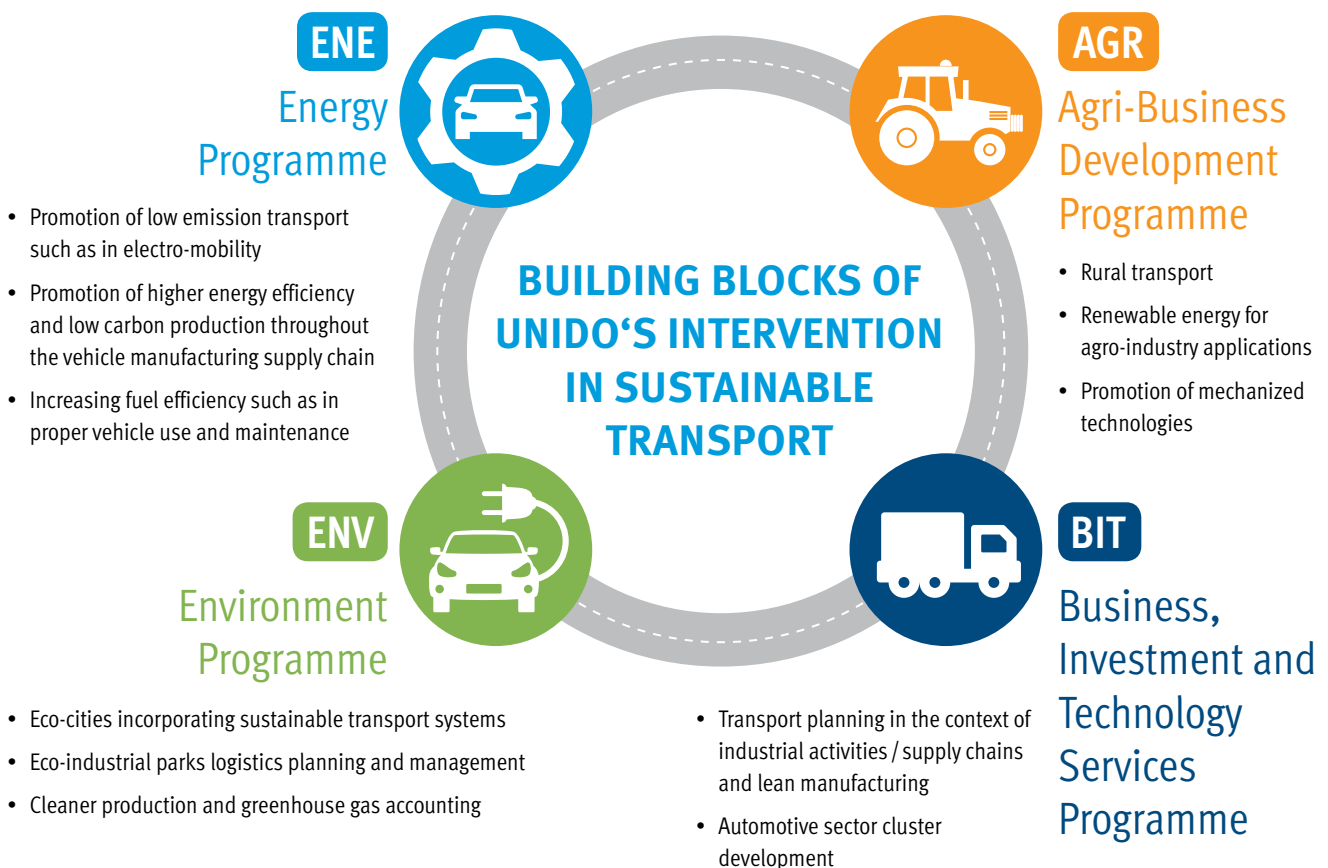


## Transport within Sustainable Cities

### MOBILITY IS A KEY ISSUE IN CITIES

Mobility is an enabler for urban life in large and small cities alike. The creation of affordable, reliable, and low emission transportation for people – which is efficient and economical for freight and business – remains a key dimension in urban planning and city level industrial development. Having adequate transport infrastructure, together with inclusive and sustainable industrialization, is a precursor to economic development, job creation and prosperity. Therefore, the provision of sustainable mobility requires policy-makers and planners to understand and incorporate the needs of different societal stakeholders into policy frameworks for providing both public and private transport.

The recently adopted Sustainable Development Goals (SDGs) include sustainable transport objectives as part of SDG7 on clean and sustainable energy, SDG 9 on innovation, industrialization and infrastructure, and SDG 11 on sustainable cities and communities, among others. UNIDO aims to promote sustainable transportation that supports the inclusive and sustainable industrial development of its member states. These interventions will focus on promoting higher efficiency, low-carbon production throughout the vehicle manufacturing supply chain, fostering enabling policy frameworks, building and strengthening local capacities and enhancing knowledge transfer and innovation.



## UNIDO LOW-EMISSION TRANSPORT STRATEGY – KEY AREAS OF INTERVENTION

### DEVELOPMENT INTERVENTIONS

#### 1. ENABLING POLICY FRAMEWORK

- Local/sectoral policies
- Technical regulations and voluntary standards
- Implementation strategies
- Incentives and financing schemes

#### 2. CAPACITY BUILDING

- Needs assessment, SME development
- Value-chain and life-cycle emission assessments
- Skills development

#### 3. TECHNOLOGY TRANSFER

- Adoption and adaptation of low carbon technologies through demonstration and pilots
- Innovation
- Technology promotion centres
- Training curricula and guidelines for industry
- Knowledge networks

### THEMATIC AREAS

#### 1. VEHICLE TECHNOLOGIES

- Standards: vehicle emissions, fuel efficiency (sale and importation), and grid connectivity
- Fiscal Incentives: taxes and fees based on efficiency/emissions
- Consumer awareness: fuel economy and emissions labels
- Support for R&D:
  - Vehicle manufacturing – advanced engine technologies (electric, fuel cell, hybrid); fine-tuning to accommodate fuel blends and alternative fuels (particularly 2-3 wheelers); testing protocols to measure vehicle emissions and fuel economy
  - Vehicle refurbishment – lighter vehicle materials; conversion technologies
  - Vehicle Inspection and Maintenance (incl. Eco-Driving)
  - System for monitoring, reporting and verification of emissions; testing methodologies
  - Life-cycle based GHG emission assessment
  - Low-emission air conditioning for vehicles

#### 2. TRANSPORT SUPPORT FACILITIES

- Sustainable cities / urban development strategies (transport planning, electric utilities management)
- Traffic Control Measures; congestion charges:
  - Charging stations (with Renewable Energy, Smart Grids);
  - Non-motorized transport structures;
  - Use of ICT in transport management

#### 3. ALTERNATIVE FUELS

- Fuel blending requirements;
- Fuel quality standards
  - Biofuels Production;
    - Fuel switching (Petrol/Diesel to LPG/CNG)
    - Analysis of life-cycle carbon emissions of biofuel products – standardized methodologies

### TARGET INDUSTRIAL/ADMINISTRATIVE SECTORS

- Government
- Automotive Manufacturer's
- Association, Service Providers/
- Recyclers
- Policy makers at the national, regional and city levels
- Industry decision makers
- Technology suppliers
- Utilities
- Sectorial industry association
- Technology and research centres
- Fuel Producers/Suppliers





# Sustainable cities case studies

## Sustainable cities initiative for **Senegal**

**Cities included in the initiative:**

Diamniadio, Dakar and Saint Louis

**Project budget:** \$9.5m GEF Grant; \$51m co-financing

**Project co-implementing agency:** World Bank

**Project donors and partners:** Global Environment Facility (GEF), Ministry of Environment and Sustainable Development, Municipal Development Agency

**Short description:** Diamniadio Industrial Park in Greater Dakar and Saint Louis aim to integrate climate risks and sustainability in planning and promote resource efficiency

## Sustainable-city Development in **Malaysia**

**Cities included in the initiative:** Melaka

**Project budget:** \$3m GEF Grant; \$18m co-financing

**Project donors and partners:** Global Environment Facility (GEF), Malaysian Industry-Government Group for High Technology (MiGHT)

Melaka will address energy, transportation and buildings segments within its city planning activities.

## Abidjan Integrated Sustainable Urban Planning and Management in **Cote d'Ivoire**

**Cities included in the initiative:** Abidjan

**Project budget:** \$6m GEF Grant; \$21m co-financing

**Project co-implementing agency:** African Development Bank (AfDB)

**Project donors and partners:** Global Environment Facility (GEF), Ministry of Urban Development, Ministry of Environment, District of Abidjan

**Short description:** Abidjan aims to improve mobility planning, resilient transport infrastructure, and various initiatives to improve the urban air quality.

**Short description:** Abidjan aims to improve mobility planning, resilient transport infrastructure, and various initiatives to improve the urban air quality.

## Sustainable Cities Integrated Approach Pilot in **India**

**Cities included in the initiative:** Vijayawada, Mysore, Guntur, Jaipur and Bhopal

**Project budget:** \$13.5m GEF Grant, \$80-100m co-financing

**Project donors and partners:** Global Environment Facility (GEF), Ministry of Urban Development - Government of India

**Short description:** Vijayawada, Mysore, Guntur, Jaipur and Bhopal will focus on waste management: the utilization of biogas from sewage treatment plant (STP) or from organic waste, solid waste-to energy, a compost plant, and landfill gas management.

## Integrated adoption of New Energy Vehicles in **China**

**Cities included in the initiative:** Yancheng and Shanghai

**Project budget:** \$9m GEF Grant, \$117m co-financing

**Project donors and partners:** Global Environment Facility and Ministry of Industries and Information Technology (MIIT), Society of Automotive Engineers of China (SAE-China)

**Short description:** The project will facilitate and scale up the integrated development of New Energy Vehicles (NEVs) and Renewable Energy (RE) in China



## Climate Change, Clean Energy and Urban Water in **South Africa**

**Cities included in the initiative:** small and medium cities with about 100,000 inhabitants

**Project budget:** \$1,7m

**Project donors and partners:** European Union (EU), Renewable Energy and Energy Efficiency Partnership (REEEP)

**Short description:** The project will catalyze market-based approaches to reducing GHG emissions in municipal waterworks



## Sustainable cities initiative for Senegal

### Context

Currently, almost 57 % of Senegal's total population of roughly 11 million people (2010) reside in urban areas. Of the 11 million people, 25% live in the Greater Dakar area and 41% in cities located along the coast including Dakar. The country's high demographic growth (+2.5%) is expected to increase its population to 25 million people by 2050 of which 16 million are subsequently expected to live in cities. As a consequence of the demographic pressure, the urban sector in Senegal has been focused primarily on habitat management and improvement. For example, about 40% of agglomeration of Dakar is estimated to be in informal settlements without provision and management of basic services such as water, electricity and sanitation, which is often located in flood-prone areas. Effective urban planning has been lagging behind these developments. Only 30 % of cities have an urban plan and the few existing ones lack consistent up-dates, implementation results and, more importantly, participation of civil society. Other constraints include a lack of integration of urban development in territorial planning; governance of land-use planning and land allocations, and discrepancies in the legal framework. The convergence of these ongoing challenges with emerging climate change impacts increase the vulnerability of cities and illustrates the increasing importance of examining the relationship between climate change processes, urban vulnerability and development in order to define responses at an urban scale. Sustainable development of cities not only needs to be addressed urgently, but must be made a priority in line with the Government broad urban poles development programme for accelerating economic growth and reducing poverty.

### Objective

The proposed integrated approach pilot (IAP) project will support specific activities related to storm water management and climate change adaptation, while also promoting more integrated long-term strategies to ensure that the government's urban growth pole strategy incorporates a greater focus on sustainability and resilience. The project will seek to share the lessons from pilots in Greater Dakar and Saint-Louis with other cities in the country to improve the potential for learning and replication. Further, the project will improve the capacity to plan and implement sustainable city management practices, including climate resilience, in selected urban areas.

### Expected outcomes

- Strengthening of national capacities on integrated urban planning for sustainable industrial parks and participation on Global Platform for Sustainable Cities (GPSC)
- An integrated Persistent Organic Pollutants (POPs) and hazardous waste management system is designed
- An enabling framework is created for implementing sustainable and resilient industrialization
- Increased use of renewable energy technologies and low-carbon technologies to reduce carbon intensity of industrialization and urbanization in Dakar and Diamniadio

### Implementing agency

World Bank, UNIDO

### Donors and partners

Global Environment Facility (GEF)



## Sustainable-city Development in Malaysia

### Context

In Malaysia, a country that has seen significant economic development in recent years, 73% of the total population of 30 million people (2012) lived in urban areas. While this growth in urbanization brings challenges in terms of urban planning and development, it also holds promise for improving the living standards, with a close link between urbanization and improved income levels. However, while there are significant opportunities in Malaysia associated with the development of sustainable cities, there are also a number of barriers present in the market that currently prevent their widespread adoption. These include:

- Lack of the necessary policy, regulations and incentive programmes to encourage investment in smart cities by the private sector, despite interest from government institutions;
- Lack of information about the factors that entail the creation of a sustainable city and limited capacity to introduce these technologies and measures; limited awareness also hinders the development of demand for such cities by the general public and businesses
- Lack of the necessary supporting infrastructure: charging station networks, service/equipment providers, support applications, maintenance, etc.

### Objective

The proposed child project will directly contribute to the IAP goals of integrated sustainability planning, namely: integrating climate risks in urban planning and management. This will be achieved through:

- integrated approach to urban planning and management that is guided by evidence-based, multi-dimensional, and broadly inclusive planning process that balance economic, social and environmental resource consideration;
- building awareness and institutional capacity, and promote investment in climate risks mitigation technologies through demonstration projects

### Expected outcomes

- National urban policy framework strengthened to promote sustainable and resilient cities model
- Improved planning and increased knowledge and partnerships on sustainable cities and climate resilience at multiple levels
- The adoption of renewable energy (RE) integrated smart grid facilitated through demonstration activities of distributed RE systems, solar-powered EV charging facilities, battery energy storage, EE and RE applications in buildings and ICT system

### Implementing agency

UNIDO

### Donors and partners

Global Environment Facility (GEF), Malaysian Industry-Government Group for High Technology

### MALAYSIA | Urbanization 2012

73% Urban population



27% Rural population



## Abidjan Integrated Sustainable Urban Planning and Management in Cote d'Ivoire

### Context

The population of Cote d'Ivoire has tripled over the past four decades, from 6.7 million in the early 1970s to its current population which stands at more than 22 million. Since 2010, over 50.1% of the population resides in urban zones. The city of Abidjan covers an area of 54,000 hectares, of which 8,700 are lagoon areas. The city's population stands at roughly 2.5 million inhabitants, and the rapidly growing population has placed enormous pressure on the allocation of road and housing space. This has led to severe traffic congestion, increased air pollution, and the rapid proliferation of informal settlements and slums, which are often cut off from public services and subject to exposure to extreme weather events. The project aims to address severe air pollution and rising GHG emissions with a two-pronged approach that addresses pollution originating from multiple sources. The project also aims to improve traffic conditions and overall mobility through the integration of intelligent transport system (ITS) elements and infrastructure in priority areas. Resultantly, this will improve traffic efficiency and thereby promote mobility, reduce road accidents, and increase the productivity of urban economic activities while concurrently reducing GHG emissions.

### Objective

To enhance local capacity to assess and respond to environmental degradation through the application of integrated sustainable urban planning and management methods while encouraging the uptake of innovative lower carbon technologies to reduce GHG emissions and improve air quality in the city of Abidjan.

### Expected outcomes

- Increased scope and depth of integrated urban and transport planning practices in Abidjan
- Increased capacity of local officials to evaluate, plan, manage and steer integrated urban and transport development

- Improved capacity of authorities to monitor, assess and improve air quality, including use of effective legal frameworks in collaboration with stakeholders
- Improved capacity of authorities to monitor, assess and improve vehicle emissions and fuel quality, including effective legal framework in collaboration with stakeholders
- Improved and maintained knowledge network in the air quality field and related fields
- The national government, in partnership with municipal government, can properly assess current industrial emissions and take preventive measures to mitigate the emission of CO<sub>2</sub> and persistent organic pollutants (POPs) in collaboration with industrial sectors
- Increased number of innovative approaches for assessing and managing urban transport and related infrastructure are introduced
- Reduced vulnerability of people, livelihoods, and physical assets to the adverse effects of climate change.

### Implementing agency

African Development Bank, UNIDO

### Donors and partners

Global Environment Facility (GEF)

**COTE D'IVOIRE**  
Population

**22** million

**6.7** million



1970



2010



## Sustainable Cities Integrated Approach Pilot in India

### Context

India's growth and urbanization trend is nothing like it has seen in the past with 2030 projections of: GDP multiplying by a factor of 5; urban population rising to 590 Million; working age population increasing by 270 Million; and net new employment in cities reaching 70% (McKinsey Global Institute, 2010). To accommodate the growing demand and competition for resources (e.g. energy and water), increase efficiency in basic service delivery (e.g. waste management, transport), provide employment and investment opportunities, and, satisfy the aspiration for improved quality of life in urban areas, the country has to develop new, or retrofit existing, cities to those that are smart, sustainable and inclusive. Government programmes recently launched: Swachh Bharat Abhiyaan (Clean India Mission), 100 Smart Cities Mission, and Atal Mission for Rejuvenation and Urban Transformation (AMRUT), are all geared towards enhancing the quality of urban life, providing a clean and sustainable environment, and laying down basic infrastructure for city service delivery. The Sustainable Cities Integrated Approach Pilot (SC-IAP) project is going to be implemented in the cities of: Vijaywada, Guntur, Mysore, Jaipur and Bhopal, integrating sustainability strategies in both urban and industrial development planning and management.

### Objective

To integrate sustainability strategies into urban planning and management to create a favorable environment for investment in infrastructure and service delivery, thus building the resilience of pilot cities.

### Expected outcomes

- Increased scope and depth of integrated urban sustainability management policies and processes, including institutionalization within the local governance structure
- Low-emission and environmentally-sound technologies contribute to city greenhouse gas emission reduction
- Promotion of "Sustainable Cities" through partnership approach

### Implementing agency

UNIDO

### Donors and partners

Global Environment Facility (GEF), Ministry of Urban Development - Government of India

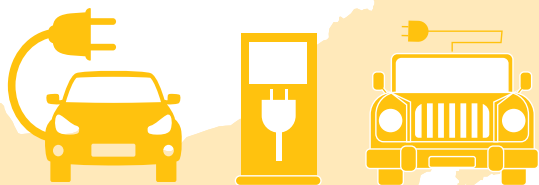
INDIA |  
Projections to  
2030

Gross Domestic Product (GDP) multiplying by a **factor of 5**

Urban population rising to **590 Million**

Working age population increasing by **270 Million**

Net new employment in cities reaching **70%**



## Integrated adoption of New Energy Vehicles in China

### Context

The main technical pathway to realize large-scale energy-savings and emission reductions in the automotive industry is through the development of “New Energy Vehicle” (NEV) technologies. These advanced-powertrain vehicle technologies, which include electric battery and plug-in hybrid technologies have the advantages of high energy efficiency (EE) and zero tail pipe emissions. While the use of EVs reduces the demand on imported liquid fuels, and thereby improves energy security, it does not reduce environmental impacts if electricity is mainly sourced from coal fired power generation. In 2012, to respond to energy and environmental challenges, the Chinese Government released the “Energy Saving and New Energy Vehicles Industry Development Plan (2012-2020)” and put forward the development goals on national NEVs. This policy set clear policy targets for the sector, namely, having 500,000 and 5,000,000 NEVs in operation by 2015 and 2020 respectively. To achieve this, China has conducted a NEV demonstration at city level in two phases: phase 1 demonstrations (2009 to 2012) were conducted in 25 cities and phase 2 demonstrations (2013-2015) are underway for 88 cities. In both demonstration phases at the city level the central government chose the cities based on their geographic, social and economic diversity and representativeness, existing foundation and/or preparation work in NEVs and demonstrated interest by the local regions to be a pilot location.

### Objective

Facilitate and scale up the integrated development of New Energy Vehicles (NEVs) and Renewable Energy (RE) through the development of policies, technologies and standard system to promote the development of NEVs and RE by deploying smart grid and smart charging infrastructure and carry out a demonstration of the integrated policies and technology standards in Yancheng and Shanghai.

### Expected outcomes

- Drafting of technical standards and guidelines to provide regulatory elements, leading to higher adoption of NEV schemes by city governments, vehicle manufacturers and consumers.
- Increasing institutional capacities and raising public awareness of policymakers and national stakeholders on the use of integrated EV-SG (Smart Grid)-RE systems.
- Demonstrating the technology integration at two city scale projects (Yancheng) and innovative business models for the promotion of EV fleets (Shanghai).
- Raising awareness of stakeholders, on NEVs research and development, manufacture, operation, and maintenance.

### Implementing agency

UNIDO

### Donors and partners

Global Environment Facility and Ministry of Industries and Information Technology (MIIT), Society of Automotive Engineers of China (SAE-China)

**NEW ENERGY VEHICLE (NEV) TECHNOLOGIES HAVE THE ADVANTAGE OF HIGH ENERGY EFFICIENCY (EE) AND ZERO TAIL PIPE EMISSIONS.**



## Climate Change, Clean Energy, and Urban Water in **South Africa**

### Context

UNIDO and REEEP are proposing a pilot initiative aimed at creating model pathways of market-based approaches to the cost effective deployment of clean energy technologies in municipal waterworks in Sub-Saharan Africa. The implementation of this pilot initiative will focus on South Africa and create a solid basis for a market-based replication and scaling up in the country and in the SADC region as a whole.

### Objective

The overall objective of this project is to catalyze market-based approaches to reducing GHG emissions in municipal waterworks in developing countries and emerging economies of Sub-Saharan Africa. The specific objective is to increase the efficiency of energy use and the renewable energy production in municipal waterworks in three selected municipalities in South Africa (small and medium cities with about 100,000 inhabitants).

### Expected outcomes

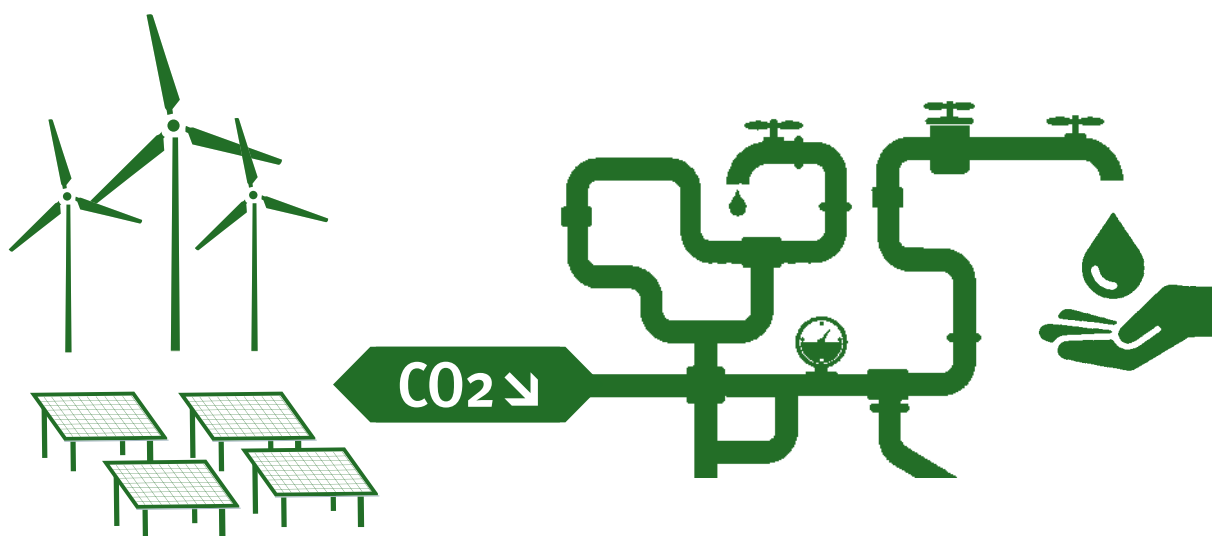
- Demonstrate the technical feasibility and commercial viability of clean energy in waterworks (demonstration projects)
- Enhance capacity of private and public players to conduct energy assessments and plans and identify RE opportunities and implement activities
- Lessons learned of demonstration projects documented and practice based policy and market insights developed
- Replicate and promote pilot projects and lessons learned and practice based market and policy insights disseminated to targeted stakeholders at national, regional and international level

### Implementing agency

UNIDO

### Donors and partners

European Union (EU), Renewable Energy and Energy Efficiency Partnership (REEEP)





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