



CITIES AND BUILDINGS



UNEP-DTIE
Sustainable Consumption
and Production Branch





CITIES AND BUILDINGS

UNEP INITIATIVES AND PROJECTS

With over half of the world's population now living in urban areas, and predicted to reach two thirds within 20 years, cities, especially in developing countries, are confronting the challenges of providing access to basic services (such as housing, transport, water and waste management), and addressing energy consumption, health hazards, pollution, and carbon emissions.

Cities consume 75% of the world's natural resources, 80% of the global energy supply and produce approximately 75% of the global carbon emissions. In general, fossil fuel prices (coal, natural gas and crude oil) have risen steadily since the late 1990s. This raises serious questions about the future sustainability of cities in terms of energy supply, their role in meeting global carbon emission reduction targets and their ability to participate in the carbon economy.

Nonetheless, this unprecedented rate of urban growth also represents a unique chance to build more sustainable, innovative and equitable urban areas. UNEP is supporting cities in their transition to sustainability, through knowledge sharing, capacity building, technology transfer and peer to peer exchanges.

UNEP's projects place a particular emphasis on sustainable buildings, which are closely linked to resource efficient urban development (infrastructure, energy needs). Buildings are key to establishing sustainable development patterns, since the sector consumes 40% of the annual energy consumption, 20% of the annual water usage, and generates up to 30% of all energy-related greenhouse gas (GHG) emissions.

Progressive action to prioritize sustainable buildings throughout the supply chain will contribute to a reduction in global resource use, an improved livelihood for millions through green job creation, enhanced places of work and residence, sustainable growth, and ultimately an improved quality of life.

Well-planned, intelligently designed cities that integrate sustainable use of surrounding and far-reaching ecosystems have the potential to improve the lives of half the planet's people today, and 80% by 2030. Infrastructure choices that are made today with respect to building design, transportation, waste management, food systems, urban ecosystem management, energy, and water have critical implications for the future sustainability of cities across the world.



UNEP's initiatives are poised to assist cities in playing a major role in decoupling economic development from resource use and environmental impacts, while achieving a better balance among social, environmental and economic objectives.

Obviously promoting and delivering resource efficiency in cities in general, and in building in particular can unlock and multiply opportunities toward sustainability.

Arab Hoballah, Chief, Sustainable Consumption and Production Branch

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UNEP addresses these objectives from three different perspectives:

1. Awareness-raising, advocacy and strategic partnerships
2. Development of tools & Knowledge Management
3. Demonstration projects

The objectives of the Built Environment

Unit are to:

- Integrate the urban dimension into key global environment issues
- Promote the link between local and global agendas and action
- Promote resource efficient and sustainable cities
- Make the case for integrating environment into strategic planning at the city level and to provide technical assistance to cities
- Focus on the building sector, which has the potential to achieve major resource efficiency gains.

OUR PROJECTS:

- **SBCI – Sustainable Buildings and Climate Initiative**
- **GI-REC – Global Initiative for Resource Efficient Cities**
- **SUSHI – Sustainable Social Housing Initiative**
- **SPoD – Sustainable Building Policies in Developing Countries**
- **Strategic Partnerships**



UNEP

Sustainable Buildings and Climate Initiative

Promoting Policies and Practices for Sustainability

» WHO WE ARE

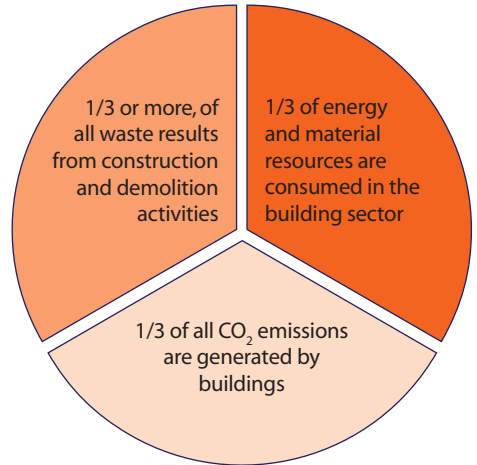
The United Nations Environment Programme's Sustainable Buildings and Climate Initiative (UNEP-SBCI) is a partnership composed of major public and private sector stakeholders in the building sector. UNEP-SBCI and its partners promote sustainable building policies and practices worldwide. Drawing on UNEP's unique capacity to provide a global platform for collective action, the initiative represents building sector stakeholders who speak with one voice when addressing sustainable buildings and climate change.

» OUR OBJECTIVES

To ensure that the initiative achieves its mission and promotes the worldwide adoption of sustainable buildings and construction practices, UNEP-SBCI's activities are guided by four key goals:

1. **Provide a common platform** for dialogue and collective action among building sector stakeholders.
2. **Develop tools and strategies** for achieving greater acceptance and adoption of sustainable building policies and practices worldwide.
3. **Establish baselines** which are globally recognized and based on a life-cycle approach, with an initial focus on energy efficiency and GHG emissions, and expanding to include additional indicators such as materials and water.
4. **Demonstrate through pilot projects** the important role buildings have to play in mitigation and adaptation to climate change at the local, national and global levels, and incorporate these results into the policy development process.

» WHY BUILDINGS?



- 10 – 40% of National GDP can be attributed to the building Sector
- Residential and commercial buildings consume approximately 60% of the world's electricity
- The building sector is the largest contributor to global GHG emissions

» WHAT WE DO

Working with UNEP-SBCI provides a unique opportunity to develop tailored projects and leverage international funding. UNEP-SBCI is involved in several large projects, either as the lead agency or as a major contributor. All these activities are carried out and supported by UNEP-SBCI's Advisory Board and Advocacy along with several Technical Advisory Committees.



1

Nationally Adapted Mitigation Action (NAMA) Development for the Building Sector in Asia. This UNEP-led project was developed based on the work of UNEP-SBCI, and will assist four countries (Indonesia, The Philippines, Thailand, and Viet Nam) to assess opportunities for potential mitigation actions (policies or projects) in their respective building sectors. Over a five year period, UNEP will work with the priority countries through a series of common and country workshops to identify and facilitate the implementation of building sector mitigation actions, and develop a 'Measurable, Reportable, and Verifiable' (MRV) methodology based on UNEP-SBCI's Common Carbon Metric to support NAMAs.

2

10 Year Framework of Programmes (10YFP) on Sustainable Consumption and Production (SCP) - Sustainable Buildings and Construction Programme. Adopted by member states at the UN Conference on Sustainable Development, the 10YFP is a global framework of action to enhance international cooperation to accelerate the shift towards SCP in both developed and developing countries. One of five priority themes identified in the adoption of the 10YFP is Sustainable Buildings and Construction (SBC). UNEP-SBCI will contribute to the development of the SBC programme, including identification of tools and strategies to support implementation of sector specific policies, and defining building sector components of national and regional SCP strategies.

3

Task Force on Greening the Building Sector Supply Chain. This task force seeks to identify opportunities and barriers, best practices and potential pilot projects for achieving greater resource efficiency (including energy, carbon, water, waste, and materials) in the construction supply chain.

4

Tools and Metrics

- Materials Metrics Study.
- Common Carbon Metric (CCM) to measure energy consumption and report GHG emissions from building operations.
- Sustainable Buildings Protocol (SB Protocol).

»» WHAT WE OFFER

Partners of UNEP-SBCI have an important role in driving the international agenda on sustainable buildings through their participation in the initiative and outreach in their region and sector. Partners of UNEP-SBCI have the opportunity to become involved in a number of activities and receive a number of benefits, which result in a competitive advantage and a deeper understanding of the

factors that affect the building sector. Benefits include the opportunity to:

- Work with global experts
- Gain first-hand access to developments in the building sector
- Help to shape global policy on sustainable buildings
- Participate in strategy development, research, projects, pilot testing, and campaigns
- Raise the partner organization's sustainability profile and visibility.



Engine to sustainability

Global Initiative for Resource Efficient Cities

>> WHO WE ARE

The GI-REC is a UNEP-led initiative launched in June 2012 at the Rio+20 Summit. The initiative currently works with different stakeholders to promote energy efficient buildings, efficient water use, sustainable waste management and other activities. UNEP and its partners aim to assist cities in combining greater productivity and innovation with lower costs and reduced environmental impacts.

>> OUR OBJECTIVES

The Global Initiative for Resource Efficient Cities (GI-REC) seeks to connect the many different entities around the world working on resource efficiency, using UNEP's convening power to mobilize partners and different constituencies, including governments at the national and local levels, civil society, business and industry and other major groups. The ultimate goal of GI-REC is to mainstream resource efficiency and sustainable consumption and production into policies and tools at the city level and to change consumer and industry behavior accordingly.

>> WHY RESOURCE EFFICIENCY IN CITIES? KEY FACTS ON CITIES CONSUMPTION AND PRODUCTION

- Cities occupy 3% of the total land surface
- Cities produce 50% of global waste
- Cities account for 60-80% of global GHG emissions
- Cities consume 75% of natural resources
- Cities produce 80% of global GDP

There is a strong link between quality of life in cities and how cities draw on and manage the natural resources available to them. Resource efficient cities combine greater productivity and innovation with lower costs and reduced environmental impacts, while providing increased opportunities for consumer choices and sustainable lifestyles. In addition, 'urban mining', the reduction of influx of resources by making better use of the existing stocks of materials available in the urban environment through increased recycling rates, is a strategy that can scale up these benefits. Resource efficiency is key for cities to contribute to local and global sustainability and offer at the same time high potential for financial savings.





>> WHAT WE DO

The Global Initiative for Resource Efficient Cities (GI-REC) provides a range of support to cities to assist with realizing the economic, social and environmental benefits of resource efficiency and SCP. GI-REC develops partnerships with key stakeholders, including local and national governments, international organizations, NGOs, private companies, etc.

>> WHAT WE OFFER

The Global Initiative for Resource Efficient Cities will provide a range of support to cities to assist with realizing the economic, social and environmental benefits of resource efficiency and SCP. The core activities include:

- Knowledge Hub
- Enabling Framework
- Network Platform

In particular the benefits for cities include:

- Gaining first-hand access to technical expertise in areas such as policy development and proven practical tools, market incentives and public-private partnership options to support resource efficiency
- Sharing experiences and best practices across cities for further improving access to resources and their efficient use.
- Developing partnerships with key stakeholders including local and national governments,

international organizations, NGOs, private companies etc.

In practical terms, this translates to access to ongoing research of the GI-REC, visibility for cities' activities in the network of GI-REC experts, co-financing for selected pilot activities, and invitations to participate in key workshops that are dedicated to support cities and institutions committed to promoting resource efficiency at the city level.

>> HIGH POTENTIAL FOR SAVINGS THROUGH RESOURCE EFFICIENCY

- Water savings globally through minor investment and behavioral change:
30 %
- Energy savings potential in existing buildings through behavioral change and application of readily available and low-cost technologies:
30 - 50 %
- Investment required for urban infrastructure in the next 20 years: Greater resource efficiency -in water, waste, transport and energy- could generate significant savings by reducing infrastructure needs and operating costs:
US 41 trillion





sushi
sustainable social
housing initiative

» WHO WE ARE

The Sustainable Social Housing Initiative (SUSHI), developed by the United Nations Environment Programme (UNEP), tests and promotes the use of resource and energy efficient building solutions in social housing programs in developing countries.

SUSHI promotes sustainable building practices by raising awareness and strengthening the capacity of social housing stakeholders.

From 2009 to 2011, our approach was tested in Brazil and Thailand. Since 2012 a new pilot project is being developed in Bangladesh and India.

» OUR OBJECTIVES

The objective of SUSHI is to promote sustainability in social housing programmes, responding to local challenges and priorities.

The project goal is to enhance the capacities of the stakeholders to integrate sustainable solutions in the design, construction and operation of social housing units, delivering environmental, social and economic benefits to low-income populations and to the society as a whole.

» WHY SUSTAINABLE HOUSING?

Housing shortage challenges in developing countries

- Lack of affordable, accessible and desirable housing alternatives leads to the prevalence and expansion of informal settlements (an estimated 828 million people are living in slums)
- Exposure to environmental hazards
- Health risks, disease and injuries
- Uncontrolled urban sprawl
- Informal economies

1.3 billion people have no access to domestic electricity

Housing needs in the next 2 decades:

- 450 million houses to build
- 22.5 million/year
- 60 thousand/day

Over 50% of developing country populations depend on solid fuel for cooking due to poor housing conditions

- Indoor pollution from solid fuel = over 2 million deaths /year

» WHAT WE DO

The project proposes a holistic approach to sustainable housing, involving all relevant stakeholders in delivering a change from the social housing business-as-usual models.

SUSHI works with policy-makers, project developers, financial institutions, research organizations and final users to find environment-friendly, efficient, and cost effective solutions to urban housing challenges.

The first phase of the project began in 2009 and was carried out simultaneously in two selected locations (Bangkok, Thailand and Sao Paulo, Brazil), in partnership with national and local authorities, research institutions, NGOs, and private sector representatives. In 2012 SUSHI entered in its second phase with the development of activities in Bangladesh and India. As a part of this phase, the SUSHI approach will be tested in a specific social housing development site in India, selected in coordination with our local partners.



This second phase will place a stronger emphasis on the monitoring of verified costs and benefits, as well as on the identification and/or development of appropriate financing mechanisms

» WHAT WE OFFER

Project teams focus on specific functions of the buildings that can be improved through locally-available techniques or solutions. To deliver sustainability improvements, project teams work with policy-makers, project developers, financial institutions, research organizations and users to:

- Assess the local context, including mapping the available alternative materials, techniques and technologies

- Assess previous experiences in sustainability in social housing, challenges and successes
- Assess market capacity, human resources and expertise to produce and implement sustainable solutions
- Survey users needs and requested improvements in housing units
- Develop targeted information materials and awareness-raising/training activities
- Assess the actual costs and benefits of potential solutions, from project to national level
- Identify financing opportunities.

The teams then develop targeted actions to remove the barriers to the uptake of sustainable solutions, seeking interventions on market supply and demand as well as public support.





SPoD - Sustainable Building Policies in Developing Countries

» WHO WE ARE

The Sustainable Building Policies in Developing Countries (SPoD) project is developed by the United Nations Environment Programme (UNEP) and funded by the Government of Finland. SPoD develops decision-support tools, targeted at policy-makers and experts, for the selection and implementation of policy instruments for sustainable buildings.

» OUR OBJECTIVES

The goal of the project is to promote sustainable building and construction practices. The SPoD tools support local and national authorities in the selection and implementation of policy packages promoting sustainability in the building sector.

» WHY SUSTAINABLE BUILDING POLICIES?

- Solutions and technologies to improve the building sector's sustainability performance exist worldwide.
- Sustainable buildings can deliver important environmental, social and economic benefits, including reduced energy, water and resource consumption, reduced operation costs, and improved living conditions.
- In addition, a market shift towards sustainability creates new market and employment opportunities, and supports innovation and competitiveness.
- Policy instruments can support this transition. Appropriate policies allow to increase awareness and capacity for the uptake of sustainable solutions, to encourage the use of appropriate financing mechanisms, and to ensure that costs and savings are distributed along the life cycle of buildings.

- Policy instruments deliver better results when combined in a package that is tailored to the local context and priorities. The SPoD project supports the development of such policy packages.

» WHAT WE DO

The SPoD project includes two main activities: the development of decision-support tools and the testing of these tools in actual decision-making processes.

Targeted decision-support tools

Through the SPoD project, two specific tools were created, which support policy-makers and experts in selecting and preparing the implementation of policy instruments for sustainable buildings.

To develop the Quick-Scan Tool (QST) and the Handbook of Policy Building Blocks, UNEP partnered with the Central European University's 3CSEP (Center for Climate Change and Sustainable Energy Policy).

Field test in Kenya and Burkina Faso

The QST and the Handbook were used in Kenya and Burkina Faso for the development of a sustainable buildings policy strategy. The decision-making process involved representatives of public, private, and academic organizations. Together, partners and experts worked on identifying policy instruments which responded to the local context and priorities, and defined a plan for the implementation of these instruments.

In Kenya, the main partners were the University of Nairobi, the Ministry of Public Works, and the City Council of Nairobi. In Burkina Faso, the SPoD team worked with the Ministry of Housing and Urban

Planning, the International Institute for Water and Environmental Engineering (2iE), and the City Council of Ouagadougou.

>> WHAT WE OFFER

The Quick-Scan Tool (QST)



The QST is a web-based questionnaire which allows users to identify opportunities for sustainability in buildings and the appropriate policy packages to tackle this potential.

The assessment considers the local context, policy environment, market conditions and trends, as well as local capacity, awareness, and existing resources. Based on the goals, target areas and priorities of the user, the tool is then able to generate a set of alternative policy packages which can support sustainability in the building sector.

The Handbook of Policy Building Blocks

The Handbook presents more than twenty-five different policy instruments, which can be combined into effective policy packages for building sustainability. Each chapter is focused on a specific instrument and provides information to design and implement the instrument, including: definition, barriers and target areas addressed, expected impacts, implementation conditions and steps, and potential interaction with other instruments. The Handbook also provides a worksheet to review the different instruments composing the policy package and prepare a strategy for implementation.



>> WHO WE ARE

Due to their complementary mandates in the fields of sustainable urban development and the global environment, UN-Habitat and UNEP have a long history of cooperation. Together, they have developed a joint work programme to mainstream environmental considerations into urban policymaking, to incorporate urban perspectives into environmental policymaking, and to highlight the linkages between local and global environmental issues.

>> OUR OBJECTIVES

Under this partnership, UNEP and UN-Habitat aim to provide improved and expanded services to local and national governments in the field of urban environment.

>> WHAT WE DO

UNEP and UN-Habitat cooperate to enable cities to better assess and prioritize local environmental concerns and to have a voice in national and global environmental debates, in particular in such areas as climate change. Helping countries and cities to implement global standards, agreements and conventions enables them to better link local issues to global concerns.

UNEP and UN-Habitat conduct joint activities on:

- Cities and climate change assessments
- Ecosystem-based adaptation in coastal cities
- Harnessing the mitigation potential of buildings, housing and construction
- Low carbon cities: the transport and urban planning dimension.

On the operational front, UNEP and UN-Habitat have taken advantage of the synergies of their respective mandates to implement a number of

joint initiatives in the sectors of transport and housing.

>> WHAT WE OFFER

Over the past five years, the two agencies have had significant achievements. They are now entering a new partnership phase during which the two agencies are strengthening their partnership in areas related to assessments, knowledge, methodologies and indicators. The joint programme will focus on thematic issues such as transport, energy and overall resource efficiency, ecosystem-based adaptation, water and sanitation. This will include joint work on:

- 10-Year Framework of Programmes on Sustainable Consumption and Production
- Resource efficiency in cities (including but not limited to urban food security, sustainable buildings, water-energy nexus)
- Transport and mobility
- Ecosystem approach to city management





Joint Work Programme with UN-Habitat,
the World Bank and Cities Alliance

» WHO WE ARE

UNEP, together with UN-Habitat and the World Bank under the facilitating role of Cities Alliance, have joined forces in addressing the complex issues of cities and climate change.

The four organizations jointly cooperate to develop:

- Global standards on greenhouse gas emissions originating from cities
- Joint position paper on cities and climate change
- Harmonization of approaches to urban risk assessments
- Online knowledge centre on cities and climate change.

» OUR OBJECTIVES

As a response to the rapid development of knowledge, practices and city demand in this thematic area, the Joint Work Programme aims to:

- Serve as a repository for all the existing knowledge and information on the topic of cities and climate change
- Promote a more coordinated and focused response to climate change issues facing cities, especially in developing countries.

» WHAT WE DO

Outputs focus on knowledge management, operational support, monitoring and awareness-raising. A prime example is the global standard for measuring GHG emissions originating from cities which was developed and launched by the three agencies in March 2010.

UNEP is leading efforts within the Joint Work Programme to develop and maintain an online repository of information on cities and climate

change. The Knowledge Centre on Cities and Climate Change (K4C) contains a database of experts and information from all over the world, and an interactive map that situates the different city-level initiatives being implemented globally to adapt to and combat climate change.

Other expected outputs include a joint effort to integrate climate change considerations into city development strategies, and a system for monitoring city performance in relation to climate change (in terms of both adaptation and mitigation).

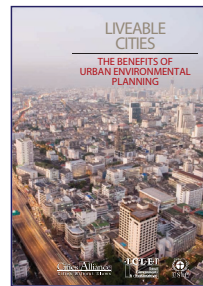
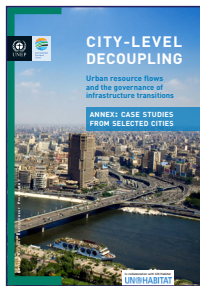
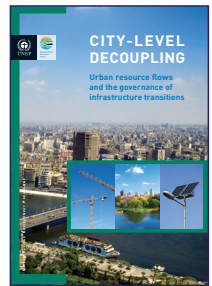
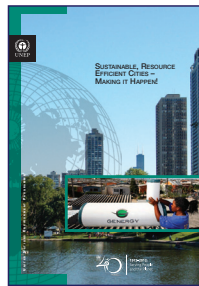
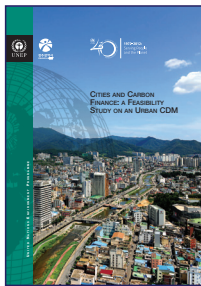
» WHAT WE OFFER

A number of objectives have been achieved thus far, including:

- Development of the *Harmonized Reporting Framework for Determining Greenhouse Gas Emissions Originating from Cities*, to measure and compare the carbon footprint of cities
- Publication of *Urban Risk Assessments: Towards a Common Approach*
- *Handbook for Mayors on Adaptation to Climate Change*, to promote adaptation strategies for cities.

In 2011, the partnership received the World Bank Award, in recognition for the work accomplished by the four organizations on Cities and Climate Change.

UNEP'S Publications



Sustainable Consumption and Production Branch

The Sustainable Consumption and Production Branch (SCP) promotes resource efficiency by encouraging sustainable consumption and production patterns. Its activities aim to reduce environmental impacts and help meet human needs by producing more with less.

A participatory, multi-stakeholder approach to the analysis of SCP challenges and design of responses is complemented by a combination of training and capacity building, communication and awareness and (increasingly) demonstration projects. These are designed to illustrate the benefits of SCP policies and actions (environmental, economic and social), and enhance the capacity of stakeholders to apply them.

Emphasis is placed on identifying SCP challenges, responses, and opportunities for developing countries to enter new markets for more sustainable products and poverty alleviation while identifying and fulfilling capacity building needs.



For more information on these projects:

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