

Green Urban Economy

Conceptual basis and courses for action

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Discussion Paper: Green Urban Economy: Conceptual basis and courses for action

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Foreword

Greening the economy is universally relevant, irrespective of the size of a country's economy, as sustainable resource management is imperative to every country's future. The green economy is a new approach which brings together sound economic decisions and actions with sustainable patterns of consumption and production. Those societies and associated economies, which understand the need to secure ecosystems' long-term functioning and social wellbeing, will have a significant advantage in responding to the challenges we will face in the coming decades. The following discussion paper will prove that though greening the economy is relevant on all levels and includes all spheres of government the local level plays an especially crucial role.

Urban areas are growing in size and importance. Megacities such as Seoul and Tokyo already have more inhabitants than the 150 smallest UN-member countries. It is the small and medium-sized city-regions in emerging and developing nations, especially in Asia and Africa, which are growing the fastest. These regions, most often, grow in unplanned and uncoordinated ways that can cause unexpected and often overwhelming social, environmental and economic challenges. Currently, about 70 percent of all resources are consumed in cities, which also account for more than 75 percent of all CO2 emissions. Cities are not only the backbones of national economies; they are also the places in which resource availability to future generations will be decided, and thus justice and equity along with it.

Greening the urban economy is a journey challenging all types of actors. While economic subjects are forced to respect environmental and social conditions to maintain healthy eco and social systems, environmentalists also need to understand the language and dynamics of the economy, and to combine necessary economic interests (such as cost savings) with ecological interests (such as saving resources).

"Cities can and should play a leading role in greening economies", is one of the key statements of the UNEP report *Towards a Green Economy* (2011). Cities can and must act as important catalysts on the road toward a green and socially inclusive economy, with a variety of approaches and instruments at hand. Some of these are described in this study and structured along:

- Technology innovation and deployment
- (New) Green business and governance models
- New green(ing) business opportunities/ investment.

An **inclusive and green economy** is geared toward reducing both poverty and inequality. It promotes energy efficiency, non-motorized mobility, investment in green technologies and employment, the creation of incentive systems for sustainable production, operations and consumption patterns, greening municipal purchase and the establishment of standards, among many others. Greening the economy also aims at preventing further climate change and its negative impacts, including mis-investments, and mitigating past environmental damage.

This **discussion paper** on Green Urban Economy was elaborated on by the ICLEI World Secretariat on behalf of the German Ministry for Economic Cooperation and Development (BMZ) in 2012, and enriched through multiple contributions from GIZ colleagues. It describes the conceptual basis for related local activities and provides input to the further development of integrated approaches for future-oriented sustainable urban development.

Our special recognition and thanks are expressed to Mr. Richard Simpson, Research Analyst at ICLEI and lead author of this discussion paper, for his intensive consultations and scientific research in elaborating this paper.

We encourage a critical and intensive discussion about the content of this paper in scientific circles, through policy makers, practitioners and among ICLEI Member cities and other local governments. The paper shall serve as a reference for the ongoing international debate.

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The discussion paper in brief

- Only since 2009 the Green Economy gained international popularity among policy makers and received greater international attention.
- The debate has shifted away from conceptual and theoretical models of environmental economics towards outcomes and benefits of a low carbon, resource efficient and socially inclusive green economy across a number of sectors and spatial dimensions.
- A very diverse picture emerges, where a similar understanding of the Green Economy characterizes a variety of actors albeit with different emphasis.
- While the debate around the Green Economy continues at the international and national level with a heavy focus on the national level, there is a need to translate this debate to urban areas, so that urban actors are addressed and respond to a Green Economy.
- Cities and urban areas are relevant as a unique entry point, because:
 1. The quantity and trends that describe cities and urban areas.
 2. The functional uniqueness of cities and urban areas marked by their physical appearance as small, dense places with overlapping infrastructures.
 3. The socio-economic opportunities cities and urban areas provide (living, consumption, production) and cities as places of deep seated poverty.
 4. The position of cities within a multi-level jurisdictional (legal, administrative and political) framework.
- Greening the urban economy requires broad, all-encompassing socio-technical change. Such change requires a strong vision, the articulation and discussion of such a vision towards mobilizing resources and coordinated actions.
- Economic activities can be greened through a variety of approaches and through each actor in their own ways.
- Currently however, only individual or isolated examples exist, which are considerably ahead of others. Tools (e.g. economic models/valuation) to support local decision-making are often not sufficiently known to make informed and comparable decisions affecting resources, income streams and expenditures/ costs for resource management.
- Monetary units are important because they are readily understood by decision-makers and the lay-public. They are important for budgets and priorities for spending of organizations (public and private).
- In response, three principal approaches are presented in this study as a red-thread for all urban actors to move towards a Green Urban Economy.
 - a) Support the locally appropriate development, promotion and deployment of green technologies and innovations.
 - b) Provide strategies and tools to explore, identify and apply green business and governance models in practice.
 - c) Support the identification and permeation of green business opportunities to the market.
- By systematically integrating and applying such considerations, economic activities, the way how actors produce, manage and administer resources, can be changed/greened. In the process it can contribute to creating jobs, delivering more utilities, and improve working and living conditions as well as the state of the environment.

- Subsequently, a Green Urban Economy approach strengthens economic instruments and approaches targeted at urban areas with the goal of impacting economic activities of urban actors to accelerate the drive towards sustainable development including poverty eradication.
- A Green Urban Economy should contribute to reaching the following goals:
 1. An eco-effective and eco-efficient economic structure
 2. Creation of green jobs
 3. Poverty eradication and inclusiveness
 4. Urban form and design for eco-effective infrastructures
 5. Energy and resource efficiency in the physical infrastructure
 6. Renewable energy production and sourcing
 7. A valued urban ecosystem
 8. Innovation, research and development
 9. Stakeholder involvement
- By identifying a series of smaller operational parts, which make up the economic activities within the city, cluster effects can be determined and potential for industrial-symbiosis can be identified amongst others. As a result resource flows can be optimized, and return on investments beyond the individual product or service can be achieved. For example, if properly and efficiently managed transport, water and sewage infrastructure, amongst other utilities, can be provided at lower cost per person and therewith also potential for less leakage, loss, pollution etc.
- The approach embodies a challenge to local governments and city actors to develop entirely new instruments (eg carbon trading in Tokyo) and to apply existing instruments in a new way (eg city properties only being offered to potential buyers who guarantee high energy standards), thereby engaging all economic actors in a much more direct way.
- The Green Urban Economy calls for a principle re-think on how a city, an organization or individual can operate more environmentally optimal while yielding the same return of capital investments (of whatever kind) or greater performance with the same capital input while reducing environmental degradation and achieving socially desirable outcomes.
- With limited or inconsistent capacities to coordinate and advance principle approaches; The global knowledge and existing technologies not reaching, or not mainstreamed in developing countries; Skill and knowledge for alternative financial assessment not widely known; Formalized policies, codes or other standards non-existent; And access to sustainable financial or material resources limited. Opportunities are still not sufficiently known, common and established.
- The success to green economies will greatly depend upon the channels of outreach, information collected, developed and innovated, and made accessible via knowledge hubs, education and training etc.
- Key public action areas include:
 1. Green jobs and poverty eradication
 2. Financing and green investments
 3. Effective governance and institutions
- To effectively facilitate and accelerate the application of these approaches in local governments, urban business enterprises and the local community, different programs should be run at each respective level from global to local and local governments should be systematically supported and capacitated to provide their full contribution to greening the (urban) economy.

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1. Introduction

This discussion paper (report) sets out a concept for a “Green Urban Economy”, as well as the possible courses for action by cities and communities which can aid and drive a transition towards green urban economies. The report is guided by the following core questions:

- What form can a Green Urban Economy take within a sustainability perspective?
- What role can city actors play in the transition?
- What are the factors for success and what challenges emerge?

This report analyses the Green Economy for an urban context to develop a more concrete concept that can be operationalized as a Green *Urban* Economy in cities, as well as how the concept can be applicable to partnerships and stakeholder collaboration. The report presents how a Green Urban Economy could look like, which actions and measures can be applied, what experiences already exist and where an action plan for consultation at city level can be established.

The report progresses by reviewing the development of the concept of Green Economy from its first popular mentioning in the late 1980s to its recent international debut. Following this, an actor analysis is conducted to show the different emphasis that have been placed on aspects of the Green Economy and the various initiatives that international reputable international organizations have developed.

In the third section, the concept for an urban Green Economy is developed by highlighting the urban (made up of towns, cities and mega-regions) dimension. These are translated into nine goals of a Green Urban Economy that provide guidance on its objective and to draw out the specific economic dimension taking into account social and environmental goals.

In the final section, the Green Urban Economy is presented in a way how it could be operationalized with three principles approaches, the roles of different actors and the local government level as the entry door to cities. A series of examples illustrate this.

2. Background to the Green Economy

2.1 Origin of the Green Economy

While “Green Economy” only gained international traction since 2008-2009, the term can be traced back to two decades earlier to two prominent publications: Pearce, D., Markandya, A., and Barbier, E. B. 1989, *Blueprint for a Green Economy*, and Jacobs, M. 1991 *The Green Economy: Environment, Sustainable Development and the Politics of the Future*. At the time Jacobs (1991) noted in the preface “... in recent years a large number have been buying books labeled ‘Green’. This one is intended to appeal both to those with a scholarly or professional interest in economics and to those, in whatever capacity, concerned about the environment.”

The “Green Economy” in its original concept is firmly rooted in the scholarly thought of environmental economics. Environmental economics acknowledges that the environment and the economy necessarily interact i.e. environmental degradation is not an incidental consequence of economic activity, but a central part of how consumption and production are organized (Jacobs 1991). Thus environmental protection requires that the environmental perspective is integrated into economic policy. Consequently, environmental economics is concerned with clarifying the way that economic processes cause environmental degradation and showing how economic and public policy can be designed to achieve environmental objectives (Jacobs 1991). It implies that economic policy needs to be changed to avert environmental damage, increasing pollution, and the exhaustion of natural resources as a result of economic activity.

At the global level this is highlighted by the concerning trend that countries with a high Human Development Index (high literacy rate, long life expectancy, high gross domestic product) have a high ecological footprint that exceeds the global average available biocapacity per person (see fig 1). The world is developing in a way that exceeds the Earth’s capacity to provide for the increasing wealth and quality of living, and thereby risking the human system’s own sustainable development. One of these resulting risks and dangers is climate change. Climate change is one of the most pressing externalities associated with human interactions with the Earth system. At the same time, those countries that have contributed the least to global environmental problems stand to suffer the most from environmental degradation.

Quite often the social impact of economic transition in the long run is then not desirable when markets fail to price in an externality, like carbon emissions resulting in catastrophic climate change. In those cases a few reap the economic benefits, but everyone pays the price of environmental degradation. An anthropogenic change to the Earth systems that takes place through economic transition has to be socially desirable in a balanced development pathway towards long-term sustainability.

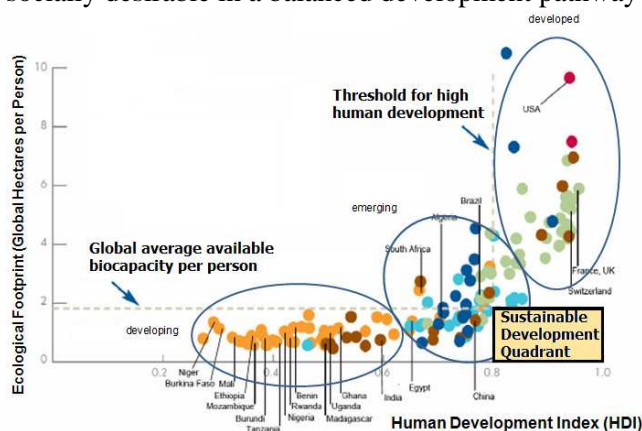


Figure 1 Illustrates the unequal environmental use and unequal human development. The socially desirable optimum in this figure is labeled the Sustainable Development Quadrant. How to get there? Source: Global Footprint Network website (Sep. 2010)

The lack of economic policy change is considered a result of an unwillingness of governments to challenge the very structures of the economic system (Jacobs 1991). Environmental economics subsequently has called for (based upon Jacobs 1991):

- a) Incorporating the environment into the conventional or ‘neo-classical’ framework of economic analysis viewing environmental degradation as an economic process.
- b) Identifying prices or monetary values of environmental commodities, which are usually available for free and thus get overused leading to environmental degradation ie valuing environmental commodities and ecosystem services.
- c) Modeling economic behaviors (eg demand side, consumer preferences, profit maximization ie economic principles such as “self-interest” and “rational behaviors”) and applying these to the environment. In practice this means designing policies to correct markets that do not on their own fully express preference of the environment eg by applying taxes for particular environmental impacts, which in turn changes consumer behavior. This is considered as the internalization of externalities, which leads to a more socially “optimal” use of resources based upon more holistic information reflected in for example the pricing of manufactured goods.

Environmental economics also seeks to go beyond conventional economic models by:

- d) Acknowledging the ethical dimension of “optimal” use of resources among and between generations. For example expressed in the differences in purchasing power and future generations’ choices.
- e) Acknowledging that people have private and public preferences, so that for example choices cannot be reduced to mere “self-interest”. It calls attention to wider institutional and cultural contexts of for example economic choices.

By considering the value of the environment, taking a long term assessment (eg long term economic prosperity), and including equity issues, environmental economics includes a strong social dimension and therefore is deeply situated within the concept of sustainable development and seen as a way to achieve this. In short, the “simple logic underlines the importance of valuing the environment correctly and integrating those correct values into economic policy” (Pearce et al 1989).

However, these publications lack attention to the practical implementation and the positive co-benefits between the social, environmental and economic dimension by applying environmental economics in practice. They set an agenda of environmental economics and their models. The implications of a greener economy have multiple other social benefits. Also it could be argued that the economic benefits of more environmentally sound practices have not been fully explored for example in technological innovation, new business models and business opportunities.

Irrespective of practical considerations, the implications of environmental economics led already in the 1980s (and earlier) to a call for a “new economic paradigm” (Jacobs, 1991). Undoubtedly environmental economics along with other branches of environmental discourse have made a profound impact on policy making and practice over the last decades, albeit with great regional, national and local disparities.

These developments are firmly rooted in a general and more widely growing environmental awareness especially since the 1960s following a series of environmental crises (eg ddt, ozone etc), as well as against a backdrop of improving socio-economic conditions. The international momentum in moving to a greater appreciation of the environment culminated in the United Nations Conference on the Human Environment in 1972. This was the first major international conference by the United Nations on international environmental issues, which was followed by the Brundtland Report (1987), and the United Nations Conference on Environment and Development also known as the Earth Summit in 1992, which later became the United Nations Conference on Sustainable Development (Rio+20).

It is not the objective here to recount the discussion and basis of environmental economics or a new economic paradigm or even ecological economics, but rather to place the origin of the currently discussed term Green Economy firmly within this context. The next section examines the Green Economy that has already gained international attention in recent years.

2.2 Green Economy's international debut

It has taken 20 years for the underlying principles of a “Green Economy”, identified above as originating from environmental economics, to be part of an international environmental discourse among policy shapers. A series of reasons could account for this, for example a greater priority given to international trade issues over international environmental disputes.

Only in 2009 the Green Economy gained international popularity among policy makers and experienced greater international attention, albeit in a much amended form as detailed in chapter 2.1. The United Nations Environment Program (UNEP 2010) describes the Green Economy as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.”

The debate has shifted away from conceptual and theoretical models of environmental economics towards outcomes and benefits of a low carbon, resource efficient and socially inclusive green economy across a number of sectors and spatial dimensions. It is unclear how the discussions of the late 1980s and those of the late 2000s are connected. It can only be speculated that the principles and experiences of what was theoretically discussed within the context of environmental economics gradually permeated to international policy making, or has been waiting for the right conditions to feature more strongly. There are two overarching and interactive developments that could explain the relatively sudden debut of the Green Economy on the international stage.

The global financial crisis in 2008 and the ensuing economic recession that subsequently occurred in many countries was an important catalyst. Nations and governments, with a greater awareness of environmental risks and opportunities, as well as concerns over resource security and commodity price volatility, looked for other sources of growth for economic development. Large investments were seen as necessary to support the recovery of national economies as well as the world economy as a whole. These financial investments and stimuli were regarded in many places as an opportunity to invest in emerging or existing green economic sectors situated in a context of an already high environmental and resource security concerns. This is particularly pronounced in agriculture, where the impacts are felt hardest amongst the poor¹. Industrialized countries are challenged also by increasing scarcity of non-energy minerals and metals with supply shortages². The initial response to the ensuing economic slowdown is epitomized by the call from UNEP for a “Green New Deal”, which identified in particular green sectors for investments in support of the recovery³.

One example is the US American Recovery and Reinvestment Act of 13 February 2009, which was a direct response to the economic crisis by providing US\$787 billion⁴, and included provisions for ‘green’ energy programs and environmental protection. Another example is the 2008-2009 Chinese economic stimulus plan announced in November 2008 with approximately US\$586 billion including US\$ 221 billion for green projects to minimize the impact of the global financial crisis.

Table 1 Amount of green funds from total financial stimulus by region

Region Name	Total Stimulus Amount (US\$ billion)	Green fund (US\$ billion)
Asia Pacific	1,153	267
Europe	325	54.2
Americas	1,007	115
China	586	221.3
European Union	38.8	22.8

Source: China International Business School, <http://www.ceibs.edu/bmt/images/20100319/23718.pdf>

¹ http://www.fao.org/economic/es-policybriefs/briefs-detail/en/?no_cache=1&uid=48900

² http://bwcv.es/assets/2012/1/17/ObservatoryNANO_Briefing_No.26_Addressing_critical_commodity_scarcity.pdf

³ http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf

⁴ http://www.recovery.gov/About/Pages/The_Act.aspx

The UK HM Government set out its business case for greening the UK economy in August 2011 called *Enabling the Transition to a Green Economy: Government and Business Working Together*⁵:

- To compete in the low-carbon technology global market;
- Enhancing energy security by reducing dependency on imported fossil fuels;
- Avoiding costs of failing to deal with climate change.

The Green Economy at the UN-level was popularized by key international organizations' publications and initiatives such as the UNEP (Oct, 2008) *Global Green New Deal* publication and the launch of the *Green Economy Initiative*, and the UNEP/ILO/IOE/ITUC (2008) *Green Jobs: Towards decent work in a sustainable, low-carbon world*.

For example, the UN Secretary General advocated the Green Economy as an investment opportunity of fiscal stimuli packages.⁶ UNEP's Executive Director in particular promoted the term within UN organizations and at other international organizations and national governments. Hereby "UNEP's Global Green New Deal and Green Economy initiative are clearly two ideas whose time has come, as evidenced by the Republic of Korea and Japan's stimulus package announcements alongside those of other key economies and leaders from China to the President-elect of the United States" Achim Steiner stated in January 2009 (ibid).

One response to this socio-economic development in the context of the sustainable development agenda at the UN-level was the decision by an UN General Assembly resolution of December 2009 (68th plenary meeting 24 December 2009, see A/RES/64/236⁷) to have the "Green Economy within the context of sustainable development and poverty eradication" and "institutional framework for sustainable development" as two focus themes to be discussed and refined at Rio+20 also known as the United Nations Conference on Sustainable Development. The objective of the conference is to secure renewable political commitment for sustainable development, assessing progress and remaining implementation gaps.

Similarities between the "environmental economists'" Green Economy and the Green Economy within the international UN-level context are striking in the form of two different sides of the same coin, in particular as they rest on similar macro-economic-environmental analysis. The Green Economy concept as currently used in the UN circles emphasizes an economy within planetary boundaries by greening economic activities without undermining human development, and as such also resolves social ills, eradicates poverty, and creates a positive balance in the labor market.

Simultaneously, the term Green Growth has also grown in popularity. It is particularly preferred among those institutions and countries which emphasize the need to have their economies continue to grow not least for socio-economic development, but also to maintain economic conditions (eg competitiveness, maintain employment levels, reduce unemployment). These related discussions are reflected within the international negotiations ahead of Rio+20 on the understanding and need for a Green Economy against other national economic priorities.

The international negotiations are relevant and important for acknowledging certain dynamisms around the term including, importantly, considerations that the Green Economy has to be applicable to and politically acceptable in diverse countries world-wide. This is particularly important as there is no internationally agreed upon definition of a Green Economy, highlighted by the reservations and variations in use of the term since the concept's inception.

At the outset, at UNCSD PrepCom I (May 2010), the Green Economy was advanced by UNEP and select developed countries, but received with reservation by for example G77 and China. Concern was expressed over the unclear meaning, whether Green Economy was intended to replace Sustainable Development, and how it would impact on trade and Overseas Development Assistance (ODA) in terms of protectionism and conditionalities attached by international donors.

Since then a very divergent picture of the positions in the negotiations could be observed from the regional meetings in preparation of Rio+20 (Prep Sep-Oct 2011) and their outcomes, for example:

⁵ APSE and Infrangilis, 2012, The transition to a green economy: the vital role of the ensuring council

⁶ <http://www.un.org/sg/statements/index.asp?nid=3550>

⁷ <http://www.un-documents.net/ares64-236.pdf>

Lack of clear definition results in the Green Economy not being mentioned (LAC) or being addressed by a list of conditions on how it can be used (Arab Region).

- Re-defining Green Economy as an inadequate “tool” or mechanism for achieving sustainable development (LAC) or as a tool that reveals unique economic and social opportunities (Arab Region).
- Concern over protectionism and donor conditionalities.
- Calls for the establishment of an enabling framework and green economy roadmap that translates the concept into a practicable policy framework.

In the Second Preparatory Meeting for the United Nations Conference on Sustainable Development (UNCSD) in March 2011, the Preparatory Committee requested the Bureau to prepare a draft text based upon all preparatory inputs for a Conference outcome document. It also allowed for the inclusion of submissions from other non-national governmental institutions. In total, 456 out of the 667 submissions to the so-called zero draft⁸ (December 2011) referred to “green economy”.

The compilation document of the “zero-draft of the outcome document” for consideration by member states in January 2012 and ongoing negotiation until the Conference in June 2012 highlight for example the following dimensions:

- Each country likely to choose own way how to implement any outcome.
- Each region highlight different priorities to be addressed in own region.
- Objective/result of Green Economy more important than “how to do” it (allows for diversity of approaches).

Additional important points that emerge from the documents relate to the use of the term. They include for example:

- Use of ‘Green and Inclusive Economy’ to express that a decoupling from environmental degradation has to include social goals, which has been suggested to be missing from the term Green Economy.
- ‘Growing’ but in a green and poverty eradicating way, to highlight the need of some regions for economic growth for human development.

Having assessed the origins and recent treatment of the Green Economy within international policy discussions, the following section analyses and compares the positions of selected, international actors regarding the relationship between the Green Economy and city-focused initiatives (status as of March 2012).

2.3 Analysis of selected international actors and their application of the Green Economy to cities (Status March 2012)

The following actors (see table below) were analysed to review their position on the Green Economy and any related city initiatives. They were selected as reputable, representative international organizations (UN and IGOs), international city actors/local government networks (LGOs), and internationally prominent private sector organizations/corporations. Some directly acknowledge that urban development plays an important role in transitioning to a Green Economy (explicitly and non-explicitly) and emphasize a need for increased cooperation with city governments and other stakeholders. The group ‘Business’ is least explicit on what a green economy can be and what it may mean for cities, but are known to have some relevant work or activity in the field of cities.

Table 2 Overview of organizations included in analysis

UN Organizations	IGOs	LGOs	Business	(Research)
UNEP	OECD	ICLEI	WBCSD	LSE
UNHABITAT	ILO	UCLG	SIEMENS	Wuppertal Institute
UNDP	WB	C40	Veolia	Global Green Growth Institute
UNDESA	G77	nrg4sd	CISCO	

⁸ Selected submissions are one key source of information to identify how selected international actors position themselves in relation to the Green Economy and in relation to cities.

The assessment was conducted through a three part methodology in order to identify and compare Green Economy approaches, concepts and initiatives:

1. An extensive web-search was conducted to collect relevant, representative, and publicly available information from the selected organisations with Green Economy being the key word search.
2. The Rio+20 submissions to the December 2011 zero draft were examined.
3. Meetings were attended to identify progress on how the terms Green Growth and Green Economy are being understood and applied; specifically the Working Party on Territorial Development Policies in Urban Areas (WP TDPUA) at OECD in Paris in December 2011 and Rio+20 preparatory meetings in New York in January 2012.

As would be expected, each organization emphasized many dimensions, but in particular the dimension of the Green Economy which reflected their advocacy role for their sector. These particular dimensions are summarized in 2.3.1-2.3.4 to highlight the diversity of understanding of the Green Economy, amongst other. Collaborations across groups or sectors are increasing. For example the World Bank, OECD, UNEP, and Global Green Growth Institute have created a 'knowledge platform'⁹, or the Green Economy Coalition to enhance interaction towards accelerating a transition by bringing a variety of actors together to promote ideas and collaboration.¹⁰

2.3.1 UN organizations

UNEP: Among the UN organizations only UNEP provides a definition of the Green Economy defined as "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2010). UNEP established an intellectual lead within the UN system through a series of special publications, speeches and events. In part this has been achieved by collaborating with other UN organizations and other partners, and necessarily including national governments. In addition to assuming the general lead role among the UN organizations on the Green Economy topic, it has specifically addressed cities in its Green Economy report. The Green Economy details across a range of sectors (agriculture, fisheries, water, forests, renewable energy, manufacturing, waste, buildings, transport, tourism, cities) the potential of investments in natural capital and energy and resource efficiency. It also provides and suggests modeling, enabling conditions, and finance in support of a transition to a global green economy.

UNHABITAT: Acknowledges that cities are crucial in the transition to a Green Economy for example in terms of economic competitiveness, strategic spatial planning, landscape ecology. Drawing upon the work of UNEP, UNHABITAT has highlighted 'greener cities' by embracing sustainable land mosaic patterns, compact cities, planned extensions, strategic and diversified economic opportunities, expansion of network infrastructure, a greener built environment and resource efficiency, protection of ecosystem services and biodiversity, resilience, and the establishment of green industries and jobs.

UNDP: Emphasizes 'pro-poor green economy' and the need to build national and sub-national capacity to redirect public and private investments toward economic activities that are both socially and environmentally sustainable.

UNDESA: Holds the secretariat that supports the Secretary General and Bureau in steering the preparatory process for the Rio+20 Conference. The UN Secretary General nominated the Under-Secretary General of Economic and Social Affairs as the Secretary of the Conference in May 2010. Therefore, UNDESA has a convening role and subsequently has lesser role in proposing positions, approaches or initiatives.

2.3.2 IGOs

OECD: Among the International Governmental Organizations (IGOs) the OECD stands out for its lead on Green Growth. However, it does not use the term Green Economy as a flag ship label or policy concept, but rather Green Growth. As already suggested under section 2.2 its meaning is similar, however, with a markedly stronger emphasis on economic growth. The OECD's "Green growth means

⁹ <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:23085841~pagePK:34370~piPK:34424~theSitePK:4607,00.html>

¹⁰ <http://www.greeneconomycoalition.org/about>

fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this it must catalyze investment and innovation which will underpin sustained growth and give rise to new economic opportunities." (OECD, March 2011). The OECD has been very active with an elaborate green growth strategy including a program relating to cities (more information see 2.4.2).

ILO: The International Labour Organization emphasizes the opportunities for creating 'green and decent jobs', while ensuring an overall positive employment balance, while addressing social inclusion. The urban level is important for the improvement of labor conditions especially because urban areas can concentrate people in what are often poor working conditions increasing health risks, resulting in a loss of productivity and other negative outcomes¹¹. A Green (Urban) Economy¹² should therefore include new employment opportunities and decent jobs, not only creating overall positive employment growth but also enhancing working conditions and increasing labor productivity.

WB: The World Bank highlights in its submission to the zero-draft environmental and social performance in operations for example in form of Corporate Social Responsibility such as in its own operations and criteria setting. While there is no direct link between Green Economy and cities in its submission or elsewhere, it is worth mentioning that they have an initiative that addresses some of the points covered under the Green Economy concept. The Eco2City initiative seeks to help cities in developing countries achieve greater ecological and economic sustainability¹³. It features an analytical and operational framework that can be used by cities across the globe to work towards their sustainability targets (ibid). It will provide practical and scalable, analytical and operational support to cities, and aims to build a global partnership among forward-looking cities, academia, and international development communities.

G77 + China¹⁴: highlight the developmental aspect of a Green Economy for poverty eradication. They strongly promote the transfer of environmentally sound technologies, access to additional finance, prevention of green protectionism, and ensure no clash with sustainable development objectives.

2.3.3 LGOs

ICLEI: Among the local government organizations ICLEI – Local Governments for Sustainability is the only organization seeking to localize the definition while drawing upon UNEP's definition. Here the "green urban economy realizes opportunities to enhance human well-being and local natural resources, while reducing future costs, ecological scarcities and environmental risks."¹⁵ It seeks to highlight that in the urban economy through the intelligent application of environmental economics, market based opportunities that if capitalized upon can also have environmental and social co-benefits, as well as realizing economic viability. It seeks to highlight opportunities as opposed to "results". The goals are effectively the same as defined by UNEP. To achieve this, local governments can play a particularly strong role, which should be respectively acknowledged at supra-local levels.

UCLG: Notes the importance for recognizing, valuing and protecting goods of common interest. With this in mind local governments should receive full national support.

¹¹Source: Simpson and Zimmermann (2012 forthcoming)

¹²In this section we define "Green (Urban) Economy" as the relation between the Green Economy to cities and urban areas more generally. „Urban“ has been set into brackets to highlight that not necessary the term "Green Urban Economy" has been applied, or the urban dimension of the Green Economy made explicit, but a conceptual relation exist.

¹³<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/0,,contentMDK:22643153~pagePK:148956~piPK:216618~theSitePK:337178,00.html>

¹⁴position (based upon Rio+20 submission to zero draft):

¹⁵http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCsQFjAA&url=http%3A%2F%2Flocal2012.iclei.org%2Ffileadmin%2Ffiles%2FICLEI_Green_Urban_Economy_Briefing_Sheet_20110215.pdf&ei=HxZjT5frL4Lysgauo-DPBQ&usq=AFQjCNF_0do1hFH8u38TTNtCUIUntdSb4Q

C40: Notes that "... sustainable development to shift buildings and infrastructure to low emission and it should be the first priority..."¹⁶

Nrg4sd: As sub-national governmental organization, Nrg4sd draws specifically on UNEP's definition, highlighting the role of subnational governments (focus on state and regional) to benefit from the opportunities from a Green Economy and how they are well placed due to their proximity to the citizens.

2.3.4 Business

WBCSD: The World Business Council on Sustainable Development highlights the role for business leadership, and how business can innovate, operationalize and grow towards sustainable development. They make specific reference to their document Vision 2050, a consensus document of participating companies, which calls for a new agenda for business in order to lay out a pathway to meet the global challenges. It also emphasizes the vital developments that the report's stakeholders hope organizations will consider putting in place to be more sustainable.

Siemens: Has underscored how the Green Economy is as huge business opportunity. They act as self-conceived green infrastructure giants and with their environmental portfolio worth EUR19 Billion (April, 2009).

Veolia: As environmental management service, Veolia provides integration of water, waste, energy and transport services. No direct reference was except the following: "by training people in the green economy's new technologies and supporting quality careers in our business sector".

Cisco: As technology service provider make ICT products, applications, services and practices to be more economic and environmental, as well as socially responsible. No explicit position to or statement on (at point of writing) the Green Economy was identified.

While it can be argued that business play an important role in setting agenda (eg private sector depend upon government regulations for protection e.g. property rights), no business related definitions on the Green Economy could be identified within this group. Overall very few publicly available statements could be identified on the Green Economy. Where there are some the emphasis is on economic opportunities and risks. A point highlighted by the UNCSD Major Group Business and Industry.

2.3.5 Research

"LSE Cities was coordinating author on the Cities and Buildings chapters of *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, a new report from the United Nations Environment Programme published in 2011. The report challenges the myth of a trade-off between environmental investments and economic growth, and makes central the roles of cities in an emerging 'green' economy."¹⁷

The Global Green Growth Institute is an organization that promotes a shift away from carbon intensive traditional economic development trajectories particularly in a developing and emerging country context. It provides advice and builds capacity to promote green growth strategies as a term for economic development. Although reference to the Green Economy is rare, by definition this is the mandate of the organization.

¹⁶<http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.uncsd2012.org%2Frio20%2Findex.php%3Fpage%3Dview%26nr%3D244%26type%3D510%26menu%3D20%26template%3D529%26str%3DHuman%2520development&ei=4BVjT4T9J8W0swbG-Z25BQ&usg=AFQjCNEMm7sCwBb9AN5YufD394NFZXuVZw>

¹⁷ <http://urban-age.net/publications/reports/2011/uneep-green-economy/>

2.4 Analysis of selected international actors and their Green Economy initiatives relevant to cities

The following tables detail key initiatives by the group actors and relevance to the city.

2.4.1 UN group

Table 3 Overview of initiatives of UN-group organizations

	Initiatives	Key publication	Tools	City Relevancy	Summary
UNEP	Green Economy Initiative (ongoing)	"Towards a Green Economy" (2011)	Regulations and fiscal policies	City chapter: Better urban planning, technology, and policy etc.	Addresses primarily national level. Has dedicated city chapter.
UNHABITAT	Expert group meeting (Feb 2011)	'Urban Patterns for Sustainable Development: Towards a Green Economy' (Jan 2011)	Sustainable urban planning	Green cities; pro poor	Little under GE banner
UNDP		"Submission to the Rio+20 preparatory process" (Nov 2011)	Building local capacity		Reference to UNEP and HABITAT as main actors
UNDESA		"Policy Brief No 12 A Global Green New Deal for Sustainable Development" (2009)			

Among the UN organizations UNEP shows clear Green Economy leadership, as already identified above. Although their main targeted audience can be considered **national** (government) level, UNEP's lead report includes a specific cities chapter. UNEP has a specific Green Economy Initiative. "UNEP's Green Economy Initiative provides a range of advisory services to more than 20 governments around the world... Advisory services include providing platforms for national dialogue and consultations; analytical and research support through macro-economic and sectoral assessments of green economy opportunities and options; capacity enhancing activities; and sharing of international experiences and best practices."¹⁸

UNEP's Green Economy Initiative can be described as follows (ibid):

- Research products through robust economic research and policy analysis, especially around the Green Economy Report and the development of The Economics of Ecosystems and Biodiversity. Publications include:
 - Working towards a Balanced and Inclusive Green Economy
 - Forests in a Green Economy: A Synthesis
 - Why a Green Economy Matters for Least Developed Countries
 - The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective - A Report by Panel of Experts (UN-DESA, UNEP and UNCTAD)
 - Driving a Green Economy Through Public Finance and Fiscal Policy Reform

¹⁸ <http://www.unep.org/greeneconomy/>

- Patents and clean energy: bridging the gap between evidence and policy
 - Brief for Policymakers on the Green Economy and Millennium Development Goals
 - Green Economy Report: A Preview
 - Global Green New Deal Update
 - A Global Green New Deal, Policy brief March 2009
 - Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World
 - Rethinking the Economic Recovery: A Global Green New Deal
- Advisory services include providing platforms for national dialogue and consultations; analytical and research support through macro-economic and sectorial assessments of green economy opportunities and options; capacity enhancing activities; and sharing of international experiences and best practices.
 - Partnership by engaging with, and stimulating collaboration between, governments, private sectors and consumers in the realization of a low-carbon, resource-efficient future. Green Economy Initiative (GEI) is the result of a joint effort by numerous experts from UN organizations, academic institutes, think tanks, businesses and environmental groups (for example ILO, International Confederation of Trade Unions, International Employers Organisation for the Green Jobs Report):
 - Develop GEI research products;
 - Harmonize Green Economy policy messages;
 - Provide and coordinate regional and country level advisory services; and
 - Identify financial and human resources to undertake green economy activities.

2.4.2 IGO group

Table 4 Overview of initiatives of IGO-group organizations

	Initiatives	Key publication	Tools	City Relevancy	Summary
OECD	Green Growth Strategy (ongoing) (Towards Green Growth; Monitoring Progress: OECD Indicators; Tools for Delivering Green Growth; Green growth country reports (Economic Surveys, Environ Performance Reviews, Innovation Reviews; Investment Policy Reviews)	Towards green growth: A summary for policy makers (PDF), Hammer, S. et al. (2011), Cities and Green Growth: A Conceptual Framework. OECD Regional Development Working Papers 2011/08, OECD Publishing	Policy frameworks and policy instruments	Green Cities Program - Conceptual framework, case studies (first drafts Paris, Tri-State), indicators for environmental and economic performance, comparative report, establishing expert network (2011-13) influence discussions on green growth, OECD's Green Growth Strategy.	Highly active, but on "green growth". Cities and Green Growth initiative.
ILO	Green Jobs Program (analysis of labor market, practical approach, waste and recycling, energy, just, adaptation) Building capacity and policy advice	UNEP, ILO, IOE, ITUC (2008) Green Jobs: towards decent work in a sustainable, low-carbon world	Tools to diagnose green jobs and potential	Referred to the relevance of urban areas.	Concentration on labour dimension

WB	Eco2 Cities: Ecological Cities as Economic Cities” is a new program to help cities in developing countries achieve greater ecological and economic sustainability, it involves a publication and seminars.	WB (2012) Eco2 Cities Guide: Ecological Cities as Economic Cities WB Eco2Cities: Ecological Cities as Economic Cities	Analytical and operational framework, seminars	Specific framework for cities’ systematical results, seminars, case studies	Developed program and plan, but under “ecological cities as economic cities” banner
G77 + China	Poverty should be an overriding priority and efforts to eradicate poverty	Submission for Rio+20	Should be used to advance development, the transfer of environmentally sound technologies and improve access to technology. Unlock the provision of new and additional sources of finance resource. Prevent green protectionism, and aid market opportunities for developing countries through the prism of the Green Economy.	No key city relevance mentioned; it is representative of the nation state perspective.	A flexible approach is required that recognizes the different levels of economic, social and environmental development, particularly conditions and priorities of unique circumstances. No clash between Sustainable Development and the Green Economy, but should rather reinforce the economic pillar

Among the IGO organizations the OECD shows the greatest Green Economy related activity, as already identified in the section above, although it is mainly targeted at national (government) level. However, it also has a specific city level initiative. OECD’s Green Cities programme and strategy for 2011-2013 includes:

- Framework for a better understanding of the green growth concept,
- Role of cities in advancing green growth,
- Core pillars of an urban green growth agenda.

The chief responsible department at the OECD is the Public Governance and Territorial Development Directorate, Territorial Development Policy Committee, Working Party on Territorial Policy in Urban Areas. The four main elements of the Green Cities program are:

1. Development of a concept paper to provide the conceptual framework and methodology for case studies.
2. Case studies: Case studies of selected cities to assess policy impacts by:
 - a. Reviewing policy interventions
 - b. Assessing policy impacts
 - c. Participation
 - i. Of representatives from the city in a network of experts (including experts, academics, and representatives of other benchmark cities and private sector).
 - ii. High-level politicians from the city in the annual meeting of the OECD Roundtable of Mayors and Ministers to contribute to discussions of best practices and highlight progress of city's case studies.
 - d. Publication of the city case study as stand-alone reports and integrated into OECD Comparative Analysis of Green Cities.
3. Environmental indicators for OECD Metropolitan areas: Development of environmental quality indicators in the context of the OECD Metropolitan Regional Database to establish the baseline environmental quality and economic performance of case study cities. In the process metropolitan environmental quality indicators are utilized, and new data collected in each of the case studies cities.
4. Comparative analysis of Green Cities: Comparative report analyzing case studies and performance indicators to identify best practices.
5. Network of technical experts and city representatives: These elements are supported by the establishment of a network of technical experts and city representatives to review and provide guidance at each state of the program. One such example at the WPURB meetings and the OECD Roundtable for Mayors and Ministers (eg. Chicago 8-9 March 2012).

Research products of the Working Party on Territorial Policy in Urban Areas (WPURB) include:

- Financing Green Growth (2011 draft).
- Cities and Green Growth: A Conceptual Framework (2011 draft).
- Dynamic cities through innovation and green growth.
- Cities and green growth.
 - The case of Paris-Ill de France.
 - The case of the Chicago Tri-State metro-region.
 - Financing Green Growth.
- Competitive Cities.
 - The Competitiveness of Global Port-Cities (Hamburg, Rotterdam/Amsterdam, Helsinki).
- Promoting growth in all regions: a collection of case studies.

The World Bank follows a similar approach, albeit not so elaborate and as well developed. The Eco2City initiative has identified that the ecological-economic intersection presents a challenge to cities. It has developed a framework to present interrelated and mutually supportive principles are (World Bank, accessed June 2012)¹⁹:

- 'A City Based Approach,' which enables local governments to lead a development process that takes into account their specific circumstances, including their local ecology;
- 'An Expanded Platform for Collaborative Design and Decision Making' that accomplishes sustained synergy by coordinating and aligning the actions of key stakeholders;
- 'A One System Approach' that enables cities to realize the benefits of integration by planning, designing, and managing the whole urban system; and
- 'An Investment Framework that Values Sustainability and Resiliency' by incorporating and accounting for life cycle analysis, the value of all capital assets (manufactured, natural, human, and social), and a broader scope of risk assessments in decision making.

¹⁹<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTURBANDEVELOPMENT/0,,contentMDK:22643153~pagePK:148956~piPK:216618~theSitePK:337178,00.html>

2.4.3 LGO group

Table 5 Overview of initiatives of LGO-group organizations

	Initiatives	Key publication	Tools	City Relevancy	Summary
ICLEI	LSE Cities-ICLEI Survey ICLEI-Springer Book Conference sessions	ICLEI Briefing Sheet Green Urban Economy, March 2011	Dissemination and awareness raising	Targeted at local governments	Knowledge and innovation, information, dissemination
UCLG	One study tour in March 2011				
C40	Association with OECD Cities and Green Growth program; Action on low carbon investment and consumption promoted.		(Carbon Disclosure Project)		Association with high profile project but very little on green economy in concrete and on website.
Nrg4sd	Workshops, conferences, "Efforts on financing and technology for green growth", 'Green economy for social progress, legal preparedness and the water energy and food security nexus for the green economy'. Reference to the European Strategy 2020 for an effective implementation of the green economy model. . Carbon Expo 2011 in Barcelona: 'Finance and Technology for Green Growth'	"Submission to the Rio+20 preparatory process" (Nov 2011) "Subnational Governments and the Green Economy".	Prioritizing government investment and spending in areas that stimulate the greening of economic sectors. Employing taxes and market-based instruments to promote green investment and Innovation. Limiting government spending in areas that deplete natural capital, Market based instruments to encourage green investment. Investing in capacity building and training.		UNEP's definition. Focus on state and regional governments.

Among the LGO organizations ICLEI – Local Governments for Sustainability shows greatest progress, as already identified in the section above, although it is mainly targeted at local governments with specific urban relevance. ICLEI has an array of activities on the Green Urban Economy to obtain knowledge, to innovate, and share experiences. These include:

- ICLEI Future of Cities Congress, Incheon, Korea, Green Economy sessions (October 2010).
- Commenting on UNEP's Green Economy report (2011).
- Outreach magazine, A Green Economy for Cities article (10 January 2011).
- ICLEI Briefing Sheet, Green Urban Economy (March-September 2011).
- ICLEI World Congress, Belo Horizonte, Brazil, Green Economy sessions (14-18 June 2012)
- Rio+20 Global Town Hall with sessions on Green Economy (13-22 June 2012)
- LSE – ICLEI, Cities and Green Economy Survey among cities worldwide (Jan – March 2012; published June 2012).
- ICLEI (2012) Background/Discussion Paper for Expert Forum on Green Urban Economy convened by the German Federal Ministry for Economic Cooperation and Development (BMZ), the City of Bonn, in collaboration with ICLEI (May 2012).
- ICLEI – Springer book: The Economy of Green Cities: A World Compendium on the Green Urban Economy (published November 2012).
- University of Amsterdam and ICLEI (2012) Role of Local Governments in Promoting Renewable Energy Businesses: A contribution to the Green Urban Economy

2.4.4 Business group

Table 6 Overview of initiatives of Business-group organizations

	Initiatives	Key publication	Tools	City Relevancy	Summary
WBCSD	Green Economy Coalition: communication, new economic foundation, encourage innovation, encourage good and stop bad practice, influence policy	"Submission to the Rio+20 preparatory process" (Nov 2011) and "Vision 2050"			Promotion of better business practice
SIEMENS	Projects towards clients e.g. green equipment finance in UK		Goods and services portfolio	City initiatives e.g. Green Cities Index, Report	Cities and local public authorities are potential customers
Veolia	Projects towards clients e.g. "demands of public authorities and industry depend on our knowledge and expertise and, more broadly, the performance " Water, waste, transportation and energy management		Goods and services portfolio including training		Cities and local public authorities are potential customers, that need to be equipped
Cisco	Projects towards clients e.g. IT products, applications, services, and practices		Goods and services portfolio	Projects towards clients e.g. IT products, applications, services, and practices	Cisco Internet Business Solutions Group's (IBSG) focus on "urban innovation" and Smart+Connected Communities.

No reference to the Green (Urban) Economy specifically could be identified through web searches.

2.4.5 Research Group

Table 7 Overview of initiatives of Research-group organizations

	Initiatives	Key publication	Tools	City Relevancy	Summary
LSE	Cities Program, Urban Age; Program on the Economics of Green Cities	Coordinated the Cities chapter in UNEP'S Towards a Green Economy; Going Green: How cities are leading the next economy	Strong research focus, conferences etc.	Focused specifically on cities.	Research oriented
Global Green Growth Institute	Research publications, and knowledge production	'Green Growth in Motion: Sharing Korea's Experience', 'Green Growth Planning GGGI Country Programs	Green Growth planning for emerging and developing countries promotes public private collaboration in developing green growth strategies.	n/a	Think tank like dedicated to green growth, nothing city specific more country focused programs
Wuppertal Institute	Research on sustainable consumption and production			Specific examples as mentioned in publications, however no key theme for cities relating to the Green Economy.	Sustainable consumption and production

2.5 Summary

In summary a very diverse picture emerges, where a similar understanding of the Green Economy characterizes the selected actors with a different emphasis or unique approaches. The engagement with the Green Economy varies from being superficial to very deep. Only two of the selected organizations have a mature and detailed strategy and program offering to Green Economy/ Growth, namely UNEP and OECD. The OECD is the only current organization which has a very specific focus and program which examines Green Growth in cities under the Green Cities program. At the same time, the World Bank addresses the theme and has a program with similar components under Eco2Cities.

Commonalities exist insofar as that in almost all cases the city level and local governments are recognized, although not always in relation to a Green Economy, as important and relevant. ICLEI, LSE, OECD, UNEP and World Bank are the only organizations which make this link explicit. As a result, there are still very few initiatives and knowledge available from these leading international organizations on a Green (Urban) Economy. It also highlights that there is a common understanding on the importance of the urban/city level to apply a framework of environmental/ecological economics stronger and as part of sustainable development. This entire trend in urban discourse and initiatives could be captured by Green Economy.

This suggests great potential to further develop a Green *Urban* Economy approach (see following part), whereby it can build upon some of the experiences and approaches of UNEP and OECD. In the process a unique Green Urban Economy profile can be developed complementing their initiatives to accelerate the transition of cities towards green urban economies.

3. From Green Economy to Green Urban Economy

3.1 Why “urban” in Green Economy?

While the debate around the Green Economy continuous at the international and national level with a heavy focus on the national level, there is a need to translate this debate to urban areas made up of towns and medium and large sized cities, so that urban actors are addressed and can respond to a Green Economy. Cities and urban areas are relevant as a unique entry point, because of:

1. The quantity and trends that describe them. They are a geographic delimited space marked by certain pressures, drivers and impacts.
2. Their functional uniqueness marked by their physical appearance as small, dense places with overlapping infrastructure, which through density and proximities provide positive externalities.
3. Their socio-economic opportunity and poverty (living, consumption, production, (socio-economic-cultural). They provide a particular living, production and consumption space as a result of these densities and proximities, which are connected beyond geographical borders through flows of information, finance, service and goods.
4. Their activities are situated within a multi-level jurisdictional (legal, administrative and political) framework. They area a jurisdictionally delimited space of executive, legislative and judicial powers of government, which is connected and influenced by neighboring and higher tier executive, legislative and judicial powers of government.

3.1.1 Quantity and urban trends

The quantities that describe cities and urban areas underscore how the urban geography is a significant and relevant entity in its own right. Urban areas make up:

- +50% of the world population i.e. 3.5 billion people;
- ~2% of world land surface;
- +80% of global GDP, with the 100 top urban areas producing ~30% of global GDP (~20 trillion US\$);
- ~70 percent of world primary energy demand/ GHG emissions;
- ~1 billion slum dwellers requiring higher housing standards;
- +3 billion more people in next 40 years.

More than 3.5 billion people are now living in urban areas; a number set to increase to 6.3 billion by 2050. All these people need jobs, food, water, housing, transport, sanitation and social services. This implies massive investments into urban infrastructure. India alone is likely to invest US\$ 300 billion over the next 20 years: “The country will have to build 700-900 million square metres of residential and commercial space a year to accommodate this growth, requiring an investment of US\$ 1.2 trillion to build 350-400 kilometres of subway and up to 25,000 kilometres of new roads per year.” (UNEP 2010, Chapter 12).

It is worth noting that there is no single definition of “urban”. In most cases, countries have their own definition according to their own needs. Even though in many cases the boundaries between urban and rural are blurred, a number of factors justify a distinction. They relate in particular around the circumstances of living (standard of living, population density, percentage employed in agriculture, availability of and access to basic utilities and medical and schooling facilities) and the rapid rate of urbanization of different sizes of urban areas. The United Nations Statistics Division goes on to suggest that “even in the industrialized countries, it may be considered appropriate to distinguish between agricultural localities, market towns, industrial centres, service centres and so forth, within size-categories of localities.”²⁰

²⁰ <http://unstats.un.org/unsd/demographic/sconcerns/densurb/densurbmethods.htm#B>

In this report, “urban” is understood as made up of towns and cities of reasonable size with a predominantly non-agricultural based economy. The larger a town or city the more complex a city will be. However, as smaller towns do not necessarily equate to an agricultural based economy, the key differentiator of a “city” is function, and nature of design, infrastructure and technology to achieve such function, rather than size per se.

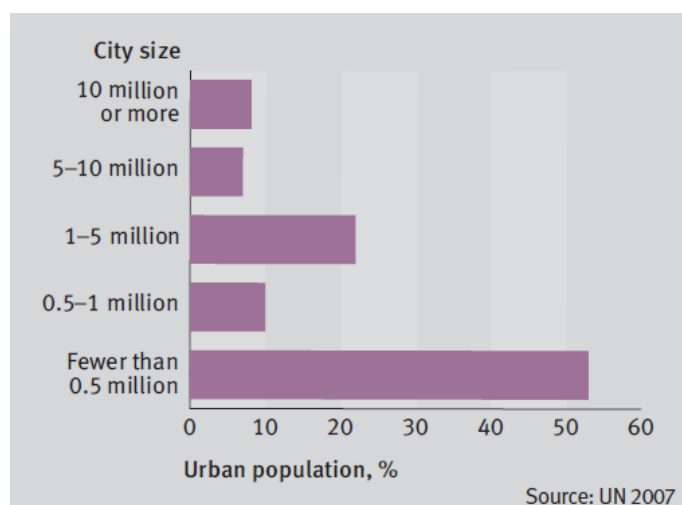


Figure 2 Urban population by city size

The trend of urbanization highlights that most changes are to take place in urban areas. Rapid world-wide urbanization is taking place:

- 29% of 2.5 billion global population in 1950,
- 52% of 7 billion global population in 2011,
- 67% of 9.3 billion global population in 2050.

At the same time the durability of the built form defines the trajectory of many future physical infrastructure investments and their use. Buildings can last for several decades and even centuries. “There is growing evidence that compact urban environments, with higher-density residential and commercial buildings (as opposed to low density, sprawl-like development) and a well distributed pattern of uses and an efficient, transport system based on public transport, walking and cycling reduce the energy footprint.” (UNEP 2010, Chapter 12)

With this subsequent amount of investment being channeled into urban development, great opportunities exist to set the right conditions for more sustainable urban development. Infrastructure built today will inform the energy and resource consumption for decades to come. These investments will be based upon market-based principles of return and will therefore have their bankability examined. Green investments and financing have to show that they can stand the test of economic benefits when including environmental objectives of eco-efficiency, energy savings etc.

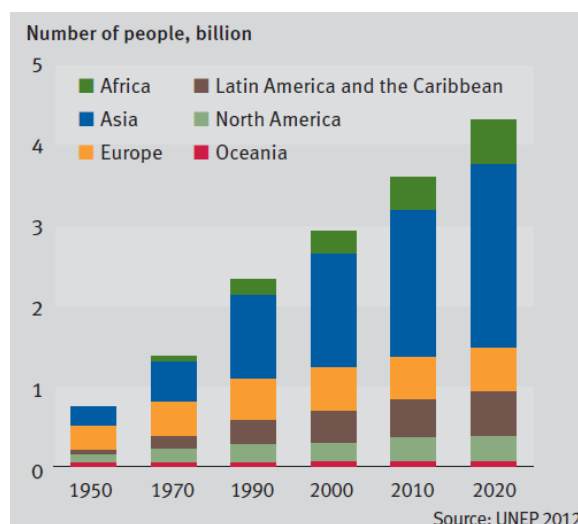


Figure 3 Total urban population by region

3.1.2 Functional uniqueness

The urban territory can be understood as located around one or more densely built urban population/employment centers, that is organized as an integrated regional production and consumption systems (an illustrative model could be the Hammarby Model in Fig 6). These can be described on hand of two indicators:

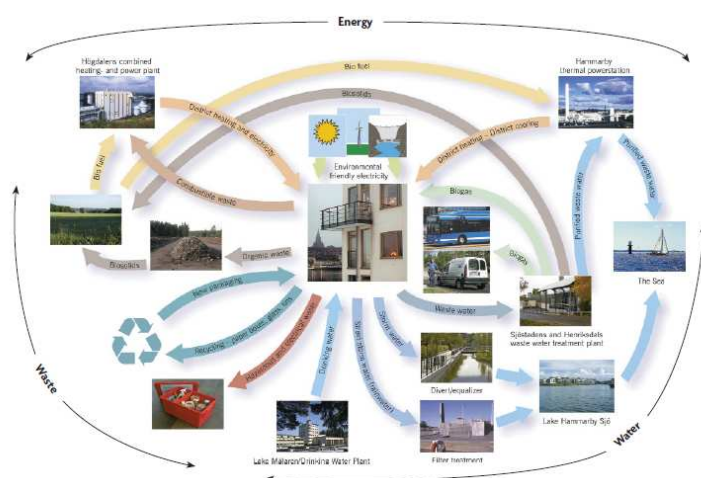


Figure 4 The Hammarby Model, Stockholm: An Example of Integrated Planning and Management; Source: City of Stockholm cited in WB (2012)

1. Infrastructure (Resource Management) Systems.

Infrastructure systems provide the essential resource inputs and environmental services for the functioning of urban economies and settlements. They may be managed by different jurisdictions or institutions (e.g., utilities) but are often physically integrated, establishing a territorial urban system footprint. By this indicator, an urban territory is the area serviced by one or more engineered infrastructure systems that are integrated as defined territorial system. Such regionally integrated systems might include local and regional road networks, public transit networks, water supply networks, local storm water and waste water networks, energy production and supply networks, and solid waste management systems. ‘Local’ and ‘regional’ systems are surely integrated into systems at larger territorial scales but can be differentiated from them based on the density of the infrastructure network or of the flows/exchanges in the network.

2. Industrial Production Systems.

Local/regional industrial production systems (i.e., secondary, tertiary sectors) establish production functions, convert primary resource inputs, establish parameters of consumption (e.g., prices) and waste streams. They may be organized at many scales but are often functionally organized with urban regions to access regional inputs. The common denominator of regional production inputs is labour supply. Labour is the primary, common form of primary resource input that is directly ‘produced’ within an urban area. An urban territory may be understood as the area where the density of work trips (per square kilometer or mile) is substantially greater than the density of work trips in the immediately outlying area. This geographically establishes the resource catchment area for production and exchange of labour as a primary factor in production.

Another way of viewing the functional uniqueness of urban spaces are the cluster effects of dense places. A particular set of externalities²¹ arise for example from the proximity of households and other land uses, and the policy issues which arise from the interplay of these economic forces in urban areas (Quigley accessed 2012²²). The main positive externalities that arise in cities are specialization, diversity and agglomeration. Examples include:

- Interplay between housing, labor location, and transport and the associated costs in monetary, asset development etc. For example: “models emphasize the trade-off between the transport costs of workers, the housing prices they face, and the housing expenditures they choose to make” within a changing context of incomes, commuting times, transport costs etc (Quigley accessed 2012). These result in cost curves and gradients from the city core. Most obvious are the negative externalities of congestion and pollution from transport. In American cities the results of the interplay have been sub-urbanization, congestion and pollution with the promotion of the car. This technology allowed “commuting from dispersed residences to dispersed worksites in metropolitan areas” during certain commuting peaks i.e. rush-hour. Road users pay the average costs of travel and take into account time costs in their trip-making behavior, but do not add the incremental congestion cost on other commuters as a result of their trip-choice. Consequently the rent gradients are flatter and the market price of land close to the urban core is less than its social value. A congestion charge during such peak hours captures this cost and alters price signals to the car commuter (Quigley accessed 2012).
- Urban areas by their agglomerative nature provide opportunities by realizing economies of scale. For example: “size of the city and its labor force determine the number of specialized local consumer goods and the number of specialized producer inputs, given the degree of substitutability among the specialized local goods in consumption and among specialized inputs in production. A larger city will have a greater variety of consumer products and producer inputs.” (Quigley accessed 2012). Diversity and specialization are important elements in competitive cities. Certain cities can build and have built up a strong specialization element.
- The durability of infrastructures like housing means that the history of the urban form of cities also matters. This means for example that realizing economic opportunities through investments in the operation of infrastructures (eg transport, utilities) (new or retrofitting), are not only dependent upon rent prices and profitability of their location, but also the existing built environment. As a result even cities with similar incomes and transport can have very different forms, and different opportunities to direct urban development.

Through the proximity of activities, cities hold a number of opportunities to realize cluster effects, or industrial agglomeration economies which through specialization have optimized resource flows, return on investments, as well as access to a large population for production and consumption. Some of these have become known as industrial symbiosis or closed cycled resource flows to highlight the positive and often interdependent relationship between different economic activities and companies often made possible through smart infrastructure.

²¹ Externality is an effect of a purchase or use decision by one set of parties on others who did not have a choice and whose interests were not taken into account. http://www.econport.org/econport/request?page=web_glossary&glossaryLetter=E It can be negative (eg pollution affecting other parties) or positive (eg economies of scale which allows the delivery of services).

²² <http://urbanpolicy.berkeley.edu/pdf/QUrbanEconProof082806.pdf>

3.1.3 Concentration of Social opportunity and poverty

Cities are centers of education, communication, innovation and trade, the concentration of which involves a variety of actors and stakeholders. They provide unique opportunities to provide people with access to key facilities like health or education, as well as jobs, over a relatively small geographical space. Cities only cover around between 1 - 2 percent of the Earth's land surface,²³ and attract large migration streams with hopes and desires of a higher quality of living. Many people migrate to cities to benefit from the access to such facilities (transport, education, health, jobs etc.). Cities offer potential to realize greater innovation through the mixing of backgrounds of people, professions and organizations.

For example, the OECD calculates that there are ten times more renewable technologies patents in urban than in rural areas and that 73 percent of OECD patents in renewable energy come from urban regions (Kamal-Chaoui and Robert 2009). Cities are incubators of innovation, research and expertise and high skilled labor (see for example Hunton²⁴ and Pratt²⁵).

Economically speaking already half of the global GDP is produced in cities – around US\$ 30,000 trillion produced in 380 developed-region urban centers (McKinsey Global Institute 2011). As one consequence, cities worldwide produce around 70 percent of global CO₂ emissions (OECD; IEA 2008 World Energy Outlook 2008).

Cities are not only sites of infrastructure investments in for example housing and utilities, but are also sites where the production of goods and services takes place. The 100 largest urban areas produce around 30 percent of the global GDP²⁶. More than 80 percent of global GDP is produced in cities²⁷.

Cities also consume around 70 percent of world primary energy demand (IEA 2008 World Energy Outlook 2008). In any economy, consumption and production of goods and services are closely linked, and this is also the case in the urban economy. For example lifestyle and behavior choice inform which products and services are supplied for the varying demand preferences. Preferences can be individual, household level, institutional or organizational. Such preferences decide how and which goods and services are bought, produced and distributed in complex supply chains. How preferences are informed has an important urban dimension. For example, by ensuring that physical infrastructure is more resource efficient allows can result in more environmentally effective lifestyles. Considered in such a way, urban areas hold great potential to reduce greenhouse gas emissions, fossil fuel consumption, reduce their ecological footprint and halt the destruction of ecosystem services etc.

The way goods and services are produced need to be altered or transformed with lower resource consumption and wastes/pollution in mind. Competition for market share is important for business. Green production needs to show its competitiveness in an increasingly global market. Lower primary resource consumption (for example by drawing upon recycled resources) and/or higher resource productivity increasingly factor in competitiveness, while prices for primary resources increase and production shift to reflect the new cost structure of critical resource inputs into the production process.

Urban areas have specific advantages in generating higher output per capita and productivity (see OECD 2011 Competitive Cities), such as specialization and diversity, R&D activities and generation of innovation, agglomeration economies, greater endowments of human capital, larger stock of physical capital, etc. which can be utilized to maintain and build competitiveness of green products and services.

At the same time, cities concentrate urban poverty and poor living conditions. For example there are nearly 1 billion urban slum dwellers requiring higher housing standards.²⁸ In many cities in developing countries slum dwellers represent more than 50 percent of the urban population. They often suffer from socio-economic segregation, absence of basic infrastructure and public facilities including

²³ Schneider, A., Friedl, M.A. and Potere, D. (2009). A new map of global urban extent from MODIS satellite 23 data. Environmental Research Letters 4(4), 044003, doi:10.1088/1748-9326/4/4/044003

²⁴ Hutton, Building successful cities in the knowledge economy: the role of 'soft policy' instruments, <http://www.oecd.org/dataoecd/11/22/40077480.pdf> (accessed June 2012)

²⁵ Pratt, Andy C. (2008) Creative cities: the cultural industries and the creative class. Geografiska annaler: Series B - Human geography, 90 (2), pp. 107-117.

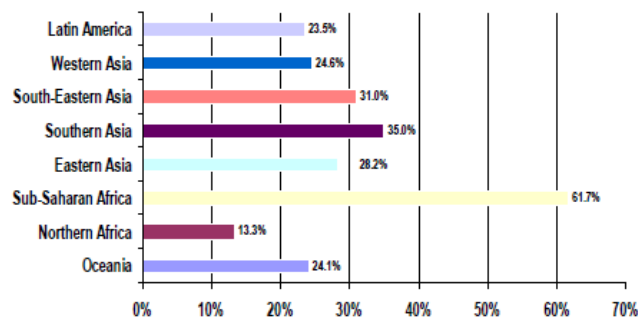
²⁶ PricewaterhouseCoopers (2009), Which are the largest city economies in the world and how might this change by 2025? PricewaterhouseCoopers: UK Economic Outlook November 2009.

<https://www.ukmediacentre.pwc.com/imagelibrary/downloadMedia.ashx?MediaDetailsID=1562>

²⁷ McKinsey Global Institute (2011), Urban world: Mapping the economic power of cities. March 2011

²⁸ Sources: UN HABITAT Global Urban Observatory 2008 cited in State of the World's Cities 2008, UNDESA World Urbanization Prospect. The 2009 Revision

transportation, water, sanitation and electricity.²⁹ They often lack sufficient living area, durable housing and secure tenure. They face challenges with employment and displacement, lack of formal recognition and work in low income jobs or in the informal economy in poor working conditions.



Sources: UN HABITAT State of the World's Cities 2010/2011, Bridging the Urban Divide, UNDESA World Urbanization Prospect. The 2009 Revision

Figure 5 Percentage of urban population living in slums

The way that economic activities in towns, cities and vast urban areas are governed and managed will subsequently define the viability of living for the vast majority of the world population. The risk of mismanaged urbanization is huge. The WEF Global Risk Report 2012 defines this as “poorly planned cities, urban sprawl and associated infrastructure that amplify drivers of environmental degradation and cope ineffectively with rural exodus”.

Even if urban areas and agglomerations hold great economic potential, there are a series of risks and challenges including mismanaged urbanization (see WEF Global Risk Report 2012 below), overstated innovation and productivity potential, as well as pockets of unemployment, inequalities, inactivity, exclusion and poverty etc. At a time of economic development uncertainty and unemployment, job creation is an important dimension to address many social ills. Relatedly, economic research in 12 countries suggests that by investing 2 percent of GDP in the green economy could create up to 9.6 million new jobs per year in the countries and industries analyzed³⁰.

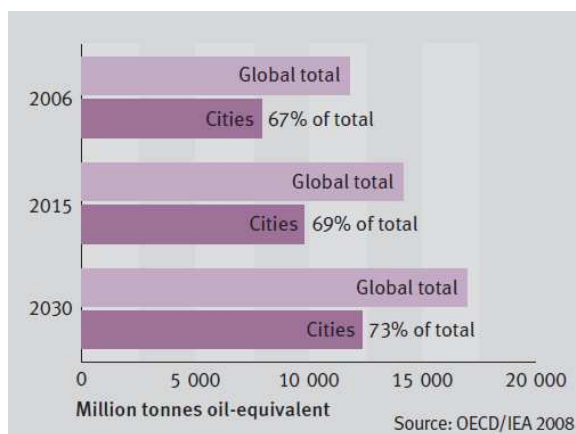


Figure 6 World primary energy demand in cities

²⁹ UN HABITAT State of the World's Cities 2010/2011, Bridging the Urban Divide, UNDESA World Urbanization Prospect. The 2009 Revision

³⁰ ITUC CSI IGB, 2012, Growing Green and Decent Jobs, <http://www.ituc-csi.org/summary-growing-green-and-decent.html?lang=en>

3.1.4 Mult-level governance structures

Cities and urban areas are governed and managed without being aligned with the growth and functioning of actual urban regions. Cities and their institutions are deeply nested and linked to higher tiers of government. For example public authorities are not only governed by local laws, but also by state, national and even international legislation. Many urban areas also cross many jurisdictional boundaries, where towns, cities and other local governments need to cooperate and coordinate at the regional level for effective urban management and planning.

For example production, distribution and consumption are deeply interwoven with a city's immediate hinterland, as well as with distant places or cities around the world through complex global supply chains.

This implies that a local government incentive structure hinges upon cross-local and supra-local governance and institutional design, while the delivery of goods as part of complex supply chains are affected by, for example, conditions and crises several thousands of miles away. The resulting framework conditions are from state to state, from country to country, very different. Local actors such as local governments can have greater or lesser powers and capacities to inform and shape local economic development, depending on this discrepancy. For example a local government's ability to borrow financial capital from the market depends upon whether they are legally allowed to and the maturity of capital markets and institutions to do so (see example Billard 2006).

3.2 Objectives of A Green Urban Economy

City actors and local governments should assume leadership in turning their urban economy green. They can influence the market through sustainable procurement. They can both show green performance and set an example by greening municipal operations; using low-carbon, low-risk energy; achieving green buildings; operating green fleets; maintaining their parks and gardens ecologically; greening fairs and events. They can attract green businesses. They can regulate through statutory planning and local by-laws. They can lead through partnerships with businesses and stakeholders and by educating their community and supporting an inclusive economy with reduced inequalities.

Cities are places of unique and significant opportunity. Such opportunities are presented not only in the potential for enhancing the use and development of green technologies and innovations (for example by yielding returns on investments into renewable energy or energy efficiency technologies), but also by greening business and governance models of urban consumables and services (for example through pricing models, green procurement, supply chain and manufacturing adjustments, or new partnerships and strategies).

The term Green Urban Economy seeks to realize this translation. The urban level has a very different set of physical, social, geographical, and economic trends, conditions and opportunities. Urban economies have unique externalities which provide economic return through specialization, diversity and agglomeration across relatively small geographic spaces. These can be further optimized towards greater environmental and social benefits.

By identifying a series of smaller operational parts which make up the economic activities within the city, cluster effects can be determined and potential for industrial-symbiosis can be identified amongst others. As a result resource flows can be optimized, and return on investments beyond the individual product or service can be achieved. For example, if properly and efficiently managed, transport, water and sewage infrastructure, amongst other utilities, can be provided at lower cost per person and therewith also potential for less leakage, loss, pollution etc.

The approach embodies a challenge to local governments and city actors to develop entirely new instruments (eg Carbon trading in Tokyo) and to apply existing instruments in a new way (eg city properties only being offered to potential buyers who guarantee high energy standards), thereby engaging all economic actors in a much more direct way. Environmentalists need to understand the language and dynamics of the economy, and to combine economic interests (such as cost savings) with ecological interests (such as saving of resources) and vice versa (Simpson and Zimmermann, 2012); and this within an urban context at city, sector, organizational and individual level.

The new opportunities that arise as a result of a transition to a Green Economy are an attractive proposition for urban governments in terms of maintaining their city's economic competitiveness and

for improving urban inhabitants' social wellbeing. The urban economy of cities and metro regions has long been the engine of their respective nation's economy; therefore the green economy is highly dependent on the 'greening' of the urban economy. Further potential of urban areas includes urban synergy and integration, technological potential (See UNEP 2011 'Cities Chapter'). The latter is important in terms of the development of environmental technologies and is essential for the development of green activity based clusters, environmental innovation including renewable energy etc. The benefits can go beyond primary economic ones to include social co-benefits (see Simpson and Zimmermann 2012).

Nine goals of a Green Urban Economy

If producing goods, services and manufactured capital transforms natural capital (for example land use change to facilitate infrastructure development, minerals into fixed assets and so forth), how can socially undesirable environmental degradation be avoided?

The focus of the Green Urban Economy is subsequently one which "realizes opportunities to enhance human well-being and local natural resources, while reducing future costs, ecological scarcities and environmental risks" (ICLEI 2011).

In other words, a green urban economy has to strengthen economic instruments and approaches targeted at urban areas with the goal of impacting economic activities of urban actors to accelerate the drive towards sustainable development including poverty eradication.

A Green Urban Economy seeks an economy within planetary boundaries ie an environmentally sustainable economy or the greening of economic activities without undermining human development. It implies an economic development which benefits human development long term. This can also include ambitions and opportunities to enhance planetary boundaries by drawing more heavily upon renewable energy sources and thereby enhancing the traditional planetary boundaries of energy supply traditionally linked to finite fossil fuels. Such a transition can only be achieved through setting the right incentive framework and mobilizing businesses, governments and civil society for more environmentally sustainable production, distribution and consumption.

The following 9 goals have been identified to suggest what a Green Urban Economy could set out to achieve (sources include: UNEP 2011, ICLEI 2011, Simpson and Zimmermann, 2012). These goals are inter-related by complimenting each other, rather than being separate goals. They also seek to reflect the principles that Green Economy should account for (excluding Rio+20 outcome document), which have already been suggested by IUTC and the Green Economy Coalition (see table below). These goals purposefully do not further specify social and cultural goals, which exist in their own right, but does acknowledge how these goals can contribute to reaching them (and with this to sustainable development (see for example the compendium on Green Urban Economy by Simpson and Zimmermann, 2012)).

1. An eco-effective and eco-efficient economic structure
2. Creation of green jobs
3. Poverty eradication and inclusiveness
4. Urban form and design for eco-effective infrastructures
5. Energy and resource efficiency in the physical infrastructure
6. Renewable energy production and sourcing
7. A valued urban ecosystem
8. Innovation, research and development
9. Stakeholder involvement

Table 8 Overview of principles Green Economy is called upon to include

Principles proposed by IUTC ³¹	Principles proposed by Green Economy Coalition ³²	Reflected in Goals
Delivers equity between and within countries.	It delivers equity - The Justice Principle	3
Ensures inclusion and participation of youth, women, poor and low-skilled workers.	It creates genuine prosperity and wellbeing for all - The Dignity Principle	3
Transforms traditional jobs and creates new green and decent jobs.		2
Respects the rights of workers and trade unions.		2
Fulfills social objectives and satisfaction of human needs in the long term, including universal access to water, food, housing, energy, land, health, education, transport and culture.	It delivers sustainable development.	3; 4; 5; 8
	It is accountable - The Governance Principle	
	It invests for the future – The Intergenerational Principle	
Promotes the efficient use of natural resources, prioritizes renewable sources, internalizes social and environmental costs, life-cycle analysis and aims at being zero carbon and zero waste.	It improves the natural world - The Earth Integrity, Planetary Boundaries and Precautionary Principle	1; 4; 5; 6; 7
	It delivers sustainable consumption and production – The Efficiency Principle	1; 4; 5; 6; 7; 8
Promotes productivity of materials rather than on cutting labor costs.	It builds economic, social and environmental resilience – The Resilience Principle	2; 4; 5; 6; 7; 8
Ensures a Just Transition for workers and communities that might be affected by change, including with social protection schemes and developing social dialogue on green economy policies.		2; 3
Is based on the real economy and reduces speculation.		
Promotes democracy.	It is inclusive and participatory in decision making – The Inclusion Principle	9

Goal 1. An eco-effective and eco-efficient economic structure.

The economic structure and activity in urban areas can be separated into three principles processes: production (the kind, type and way services and goods are produced), consumption (the kind, type and way services and goods are being consumed), and distribution and disposal (the kind, type, and way resources (raw and processed including wastes) flow and circulate in the process of production and consumption).

Production: The economic structure and activities of producers can become more eco-effective and eco-efficient by for example:

- i) Promoting the development of producer sectors that are not carbon and resource intensive.
- ii) Promoting cleaner and more resource efficient technologies and management approaches in traditional producer sectors.

Consumption: The kind of consumption informs what kinds of products are offered on a market (and vice-versa). Consumption choices and patterns can be altered in the direction of a greater market share of green products and services. The range of available products and consumption and lifestyle choices can be designed to, for example:

³¹ ITUC CSI IGB, 2012, Growing Green and Decent Jobs, <http://www.ituc-csi.org/summary-growing-green-and-decent.html?lang=en>

³² Green Economy Coalition, 2012 Draft – Principles for a Green Economy <http://greeneconomycoalition.org/sites/greeneconomycoalition.org/files/9%20Principles%20for%20a%20green%20economy%2028DRAFT%20for%20CONSULTATION%29.pdf>

- i) Include environmental criteria in organizational and individual procurement decisions (eg. green procurement, Fairtrade or FSC labels).
- ii) Provide greater information on the environmental costs of a product (eg. carbon footprint labels).
- iii) Promote common minimal environmental and social standards of goods (eg. ISO).

Distribution: The way that resources (raw and processed, including “wastes”) circulate within an economy can be designed to be more effective and efficient by utilizing, recycling and reusing many side products and wastes that the local economy produces. For example:

- i) Re-using products for sale on the market.
- ii) Utilizing wastes and side-products of production processes to realize an ‘industrial ecology’ and ‘industrial symbiosis’ – turning wastes into a resource.
- iii) Promoting recycling to reduce dependency on raw materials for new products.

Goal 2. Creation of Green Jobs

The transition and the growth of the Green Urban Economy need to create a positive balance of jobs in the urban economy and lift people out of poverty. New jobs and the transfer of labor into more eco-efficient and eco-effective sectors are pivotal. The ITUC defines a Green Job as one that “reduces the environmental impacts of enterprises and economic sectors to sustainable levels, while providing decent work and living conditions to all those involved in production, and ensures workers’ rights are respected. Green jobs are not only those traditional jobs people think of as green – like making solar panels, manufacturing wind turbines, water conservation and sustainable forestry. They also include retrofitting related jobs in the construction and public transport sectors, and making energy efficiency improvements in manufacturing plants, along with services supporting all industries. A decent job ensures safe work, fair wages, respect for workers’ rights and social protection.”³³

While this can be considered a very idealistic definition, it does highlight an important distinction between a green (in the sense of environmentally sound within planetary boundaries and relative impact) and decent (in the sense of socially sound meeting human rights and addressing relative poverty). To still make it a workable definition, it would need to be adjusted to specific local and regional context bearing in mind standards of living and scale of environmental impact. The subsequent goal is then one, where in the transition process, working conditions are made safer and environmentally more sound, while contributing to a higher living standard to all urban dwellers by for example:

- i) Promoting new economic sectors and business opportunities (eg new products, services, such as retrofitting buildings, new construction materials, waste recycling, renewable energy innovation, which also benefits the local environment).
- ii) Anchoring jobs locally through locally produced goods (eg local foods) and services (eg waste recycling), and tighter local supply chains of waste-resource distribution and goods and services.
- iii) Re-Training and up-skilling (eg. informal or poor working condition workers).
- iv) Investing in safer and healthier jobs to benefit from higher productivity, losing fewer working hours.

Goal 3. Poverty eradication and inclusiveness

In the process people need to be lifted out of poverty, be socially inclusive, achieve social advantages and have living conditions improved, for example by:

- i) Addressing and including low-income and marginal groups by ensuring their access to better insulated homes and to renewable sources of energy to reduce energy consumption levels and lower their energy bills, increasing access to utilities and reducing exposure to air pollution.
- ii) Improving sanitation and fresh water supply through its formalization and more efficient delivery can reduce persistent poverty and the adverse impacts of water-borne disease.

³³ ITUC CSI IGB, 2012, Growing Green and Decent Jobs, <http://www.ituc-csi.org/summary-growing-green-and-decent.html?lang=en>

- iii) Building houses for the urban poor which benefit from higher energy efficiency and renewable energy so that their energy bills are reduced.

Goal 4. Urban form and design for eco-effective infrastructures

Urban form and design play a key role in realizing infrastructure and service efficiencies. Cities can be designed, planned and managed to limit resource consumption and carbon emissions for example through higher densities and reducing sprawl. An understanding of the dynamics between urban form and resource use also ensures smart city growth which avails of the structural, integrative and technological potential of urban centers.

- i) Developing strategic land use planning through plans and schemes to guide and influence urban development towards smart infrastructures and dense cities while preventing urban sprawl.
- ii) Developing strategies that enable a more cost effective delivery of infrastructure services in an urban system ie through the integration of energy efficient buildings, transport delivery, ecosystem provision and renewable energy utilization in the urban landscape.
- iii) Setting important signals and providing options for behavior choice (eg public transport).
- iv) Ensuring accessibility of urban services to all urban habitants.

Goal 5. Energy and resource efficiency in the physical infrastructure.

A sustainable urban economy addresses issues relating to energy costs and security as well as improving resource efficiency. Examples include:

- i) Green buildings: Energy efficient building technology in new buildings (particularly relevant in rapidly urbanizing economies) and the retrofitting of existing buildings to achieve reductions in energy use, thereby reducing GHG emissions.
- ii) Efficient public-mass transport: An efficient and sustainable integrated urban transport system for socially equitable, energy efficient and economically viable mobility. A functioning and accessible mass public transport system can reduce negative costs associated with road congestion, pollution and use of urban land.
- iii) Integrated and effective water and waste management are among the most important core urban services. Costs can be reduced and economic opportunities harvested by reducing leakage, reducing water cleaning costs, reducing costs for importing water etc; wastes can be more efficiently handled and considered as a resource for further good or energy production. For example reducing, reusing and recycling waste reduces the amount of waste generated, reduces the amount to landfill or treatment, and creates job opportunities.

Goal 6. Renewable energy production and sourcing.

Energy generation through renewables (solar, biomass, wind, water etc.) has multiple economic benefits. Local companies can be established for renewable energy production. This creates local jobs through for example installation, and can add to clustering effects.

- i) Increasing renewable energy including solar, solar powered heating systems, geothermal, biomass etc. in the urban area and region for local and regional energy market for sale.
- ii) Collecting waste by-products from industry and commerce for fuel in transport and heating such as biogas etc.

Goal 7. A valued urban ecosystem.

The management of ecosystems and the protection of biodiversity in conjunction with the maintenance of open green space are pivotal to maximize the environmental and economic services they provide. Examples include:

- i) Providing green open spaces: Economic opportunities include recreational services as sites for consumption, carbon sequestration for carbon trading schemes especially in urban forestry etc. Nature also has an important role to play for the local culture and local practices, around which economic activities can be based (e.g. local festivals, local food production).
- ii) Promoting tourism from biodiversity: Protection of unique habitats, flora and fauna is important in terms of urban biodiversity. This can be used to encourage eco-tourism, also increasing potential for job creation.
- iii) Exploring unconventional sites: New design strategies have pioneered the use of green roofs and facades on buildings, to add to the quantity of natural (as opposed to man-made) surfaces in cities and to reduce cooling energy demand. “Green Curtains” around public buildings and private homes to avoid buildings overheating in summer can reduce the need for air conditioning (ICLEI 2009b).
- iv) Ensuring other sources for economic production: landscape areas can also be used in terms of urban agriculture, important in relation to the local circular economy and reducing a city’s ‘food footprint’; the development of markets for green and local goods and services; and the reduction of carbon intensive imported products. Ecosystems are also important for flood control, overall resilience and the wider welfare effects they generate directly as a source for livelihoods or indirectly as recreational and cultural sites (TEEB 2010).
- v) Securing livelihood basis: Inhabitants can also depend upon local ecosystems for important sources of food and energy for consumption or trade.

Goal 8. Innovation, research and development

Availing of the structural and technological potential of cities in terms of concentration of knowledge, expertise, research and capacities propels innovation.

- i) Promoting research and development on smart growth.
- ii) Promoting strategic partnerships with universities and research institutes in key growth sectors.
- iii) Strengthening engagement with and by the private sector.

Goal 9. Stakeholder involvement

The role of the local government is essential but equally important is the role of the civic society and the private sector. The private sector is an important stakeholder in terms of knowledge, expertise, technological advancements, and finance and investment particularly in times of government fiscal austerity.

Strong collaboration with research institutions and academia is essential in terms of measuring progress and scientific, technological and policy innovation. Local involvement in the form of civil society and bottom up approaches is essential in support of local based action.

- i) Saving money through reduced or voluntary maintenance costs, preventing anti-social behavior and garnering support for the social/civic economy, as well as preventing unnecessary delays through negative sentiment towards a project, product or process by cementing public support for implementation.
- ii) Providing information and awareness for support and acceptance of a change in policy direction.

3.3 Definition of the Green Urban Economy

The Green *Urban* Economy is a process of transforming existing and transitioning urban economies to be more environmentally benign and socially desirable - therewith an important driver towards sustainable urban development and green and decent jobs. In turn, such a transition can be achieved through: more eco-effective and resource efficient economic activities; creating new business and green jobs for a positive labor balance; designing more efficient infrastructures (eg buildings, transport, water) and urban form (land-use and development); producing more renewable energy, and by giving greater value to local ecosystems. It is essential that such a transition process is also inclusive of marginal and disadvantaged groups. Such groups should benefit from new and a shift towards green jobs and improved workplaces, contributing to the eradication of poverty. In such a way human development and quality of living in cities can be improved over the long term.

Local actors (including business, civil society and government) have the ability to realize and facilitate the opportunities that exist in the transition to a green urban economy. Local governments need to create the desired conditions that firms and businesses require to set up operations in a particular urban area. This can be achieved by passing resolutions, adopting plans, preferential treatment (including financial) for green sectors (Special Economic Zones, Green Business Clusters etc.), and establishing programs or departments to deal specifically with the new green economic trajectory.

The Green Urban Economy will not replace sustainable development; rather it needs to be seen as a transition process of the existing urban economies to one that is more environmentally benign and socially desirable (see table below).

Table 9 Description of key terms around Green Urban Economy

Term	Description
Green Economy in the context of sustainable development and poverty eradication	"one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive." (UNEP 2010)
Green Urban Economy in the context of sustainable development and poverty eradication	strengthens economic instruments and approaches targeted at urban areas with the goal of impacting economic activities of urban actors to accelerate the drive towards sustainable development including poverty eradication.
Urban	Refers to towns, cities and mega-urban regions as a place of living, activity, administration and functional unit.
Economy	Refers to the management of household or private affairs and especially expenses. It also relates to the management of resources of a community, country, etc., especially with a view to its productivity.
Green	Relates to the preservation of environmental quality and supporting environmentalism.
Sustainable Development	Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Report)
Poverty eradication	Relates to the Universal Declaration of Human Rights ³⁴ Article 25 (1), which states that "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services". This right is further reaffirmed in the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights. ³⁵ They derive from the inherent dignity of the human person. Extreme poverty has been recognized by the General Assembly as a violation of human rights, even of the right to life itself ^{36, 37} .

³⁴ General Assembly resolution 217 A (III) of 10 December 1948.

³⁵ General Assembly resolution 2200 A (XXI), annex.

³⁶ See General Assembly resolution 59/186 of 20 December 2004 entitled "Human rights and extreme poverty".

³⁷ <http://www.un.org/esa/socdev/rwss/docs/2010/fullreport.pdf>

Towards this aim, greening the urban economy consists of a bundle of measures, laws, instruments, and mechanisms by a variety of actors, which reward ecologically and socially sensible action economically to accelerate the transition of the economy towards a sustainable urban economy. This is not to disregard social and cultural actions and targets for sustainable development, but rather to set new impulses and priorities in the way how the economy is run.

Technology innovation, green business and governance models and green business opportunities are the principle approaches that can be drawn upon by all actors. A Green Urban Economy seeks to:

- a) Support the locally appropriate development, promotion and deployment of green technologies and innovations.
- b) Provide strategies and tools to explore, identify and apply green business and governance models in practice.
- c) Support the identification and permeation of green business opportunities to the market.

3.4 Drivers of a Green Urban Economy for sustainable development

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”³⁸ Sustainable Development builds upon two key concepts:

- ‘Needs’, for example of the world’s poor which should have overriding priority.
- ‘Limitations’ that are imposed by the state of technology and social organization on the environment’s ability to meet present and future ‘needs’.

It aims to address the realization of certain “Limits of Growth”, better understood as the ecological footprint and Earth’s finite resources or carrying capacity and absorptive capacity. Sustainable Development has been a popular leitmotif for various civil, governmental and private actors, not least due to the term’s wide malleability and ambiguity in use and definition. The way how the human and Earth systems interact is illustrated below (fig below)³⁹.

The economy is the motor of the cycles of consumption and production from which humans and societies exist and benefit and derive value from. The economy draws upon resources from and releases materials into the Earth’s system following a process of physical and value transformation. In the process of transformation, economic flows and transactions are driven and framed by market forces and governance and management politics.

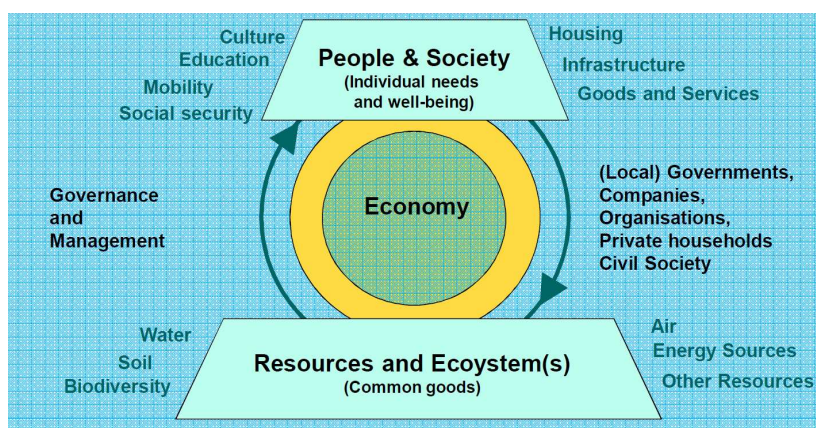


Figure 7 Interaction of the human and Earth system through economic activity

³⁸ World Council on Environment and Development, which became the Brundtland Commission

³⁹ Models have tried to show the conceptual and organizational arrangement of what sustainable development is and which interactions between the Earth and human system take place. These have evolved from simple to more complex models. The first most prominent and popular model is the three pillars of sustainable development. The three pillars are economic (or economic growth), environmental (environmental protection), and social (social progress). This is popularly described as overlapping circles, where the area of greatest overlap represents sustainable development. Another model is the three concentric circles, which better represents how each layer is ultimately nested in the other and each are interdependent, rather than separate.

Building upon the opportunities presented in cities, a Green Urban Economy strives for an economic development trajectory that does not conflict with environmental objectives but rather is mutually compatible and mutually advantageous, while simultaneously supporting human development objectives. Specifically it explores an economic entry point.

A Green Urban Economy is as such not a replacement of sustainable development, rather complements it by focusing on the economic dimension of (natural) capital and value transformation; how the circulation of flows through economic activities can be optimized towards more environmentally and socially beneficial outcomes. In the process private and public actors realize the explicit economic opportunities presented in new and available technologies, business and governance models, and markets with new knowledge and information, cooperation and changing consumer patterns, amongst others.

This is the entry point of a Green urban Economy by strengthening economic instruments and approaches targeted at urban areas with the goal of impacting economic activities of urban actors to accelerate the drive towards sustainable development including poverty eradication.

A recent Expert Forum⁴⁰ identified the most relevant themes of a Green Urban Economy as: Green jobs and poverty eradication; Financing and green investments; and Effective governance and institutions.

3.4.1 Green jobs and poverty eradication

Economists have projected that if two per cent of GDP were to be invested in the green economy over each of the next five years, this could create up to 48 million new jobs in 12 countries alone.⁴¹ The ITUC defines Green Jobs as employment that reduces the environmental impacts of enterprises and economic sectors to sustainable levels, while providing decent work and living conditions to all those involved in production, and ensures workers' rights are respected.

At the same time, close to one billion urban dwellers live in slums. They lack access to improved water supply and sanitation, and often lack sufficient and stable housing and secure tenure. They face unemployment and displacement, lack formal recognition and work in low-income jobs or in the informal economy. They often suffer from socio-economic segregation, absence of basic infrastructure and public facilities including transportation, water, sanitation and electricity. The transition process needs to make working conditions safer and environmentally more sound, while contributing to a higher living standard for all urban dwellers.

This could be achieved by:

- Creating a positive growth of green job opportunities;
- Being inclusive of especially the unemployed and lowest income groups;
- Accounting for varying incomes and working conditions of especially the poor and their different scale of environmental impact (local versus global);
- Strengthening skills to address environmental changes, such as climate change;
- Advancing decent work and pro-poor sustainable development as a single integrated development strategy.
- Addressing the structural and multi-dimensionality of poverty;
- Promoting equitable access to and efficient use of natural resources and services for improvement of livelihoods;
- Ensuring no short-term suffering from a long-term transition process.

⁴⁰ Expert Forum on Green Urban Economy, BONN PERSPECTIVES was convened by the Federal Ministry for Economic Cooperation and Development (BMZ) and the City of Bonn in collaboration with ICLEI – Local Governments for Sustainability http://www.bonn-perspectives.de/en/dialogue-events/green_urban_economy.html

⁴¹ ITUC CSI IGB, 2012, Growing Green and Decent Jobs, <http://www.ituc-csi.org/summary-growing-green-and-decent.html?lang=en>

3.4.2 Financing and green investments

Most cities worldwide, particularly in developing countries, suffer from a lack of financial resources, even for performing their ordinary tasks. In many cases their financial situation is aggravated by a high level of indebtedness. This creates a bottleneck for any additional investment regardless of whether it is green (or might be considered as such) or not.

When shifting decision-making authority from the national to the local level and managing public infrastructure and services closer to local level, fiscal resource management needs to be made at the local level too. However, often devolution of responsibility has not been matched with fiscal capacity. In addition, the maturity of capital markets is a further challenge in many countries. Local governments and other local actors are often unable (legally or structurally ie there is no banking structure) to leverage finance from capital markets. One result is a growing gap between the delivery of services and local governments' revenue streams.

Without support from national governments (eg incentives, subsidies, loan guarantees, law, banking structure) this picture can hardly be changed. The question of whether cities will be able to cope with the challenge of moving towards a green urban economy therefore depends just as much on how state revenues are redistributed to municipalities as on the political willingness of local decision-makers.

On the other hand, local leaders can exert strong political influence on decisions taken at national level. Therefore, initiatives for creating an enabling financing framework for green urban investments should involve both national and sub-national stakeholders.

Public resources alone, however, will not be sufficient to meet cities' investment needs. In order to overcome financial constraints, a large share of the required capital has to come from the private sector. With regard to infrastructure services (energy, transport, water, waste), different types of public-private partnerships are under discussion.

Private sector investments are an ever more prescient need in times of government financial austerity. Private sector finance is important in terms of investment for new startups, Small Medium Enterprises (SMEs), green market development and investments in green infrastructure.

It calls on city actors, in particular local governments, to be more "business savvy" on utilizing their assets and jurisdictional, political, administrative or operation powers towards more environmentally and socially benign outcomes. This requires local governments to select the best intervention from a range of possible alternatives, matching long-term costs against benefits and drawing out a long term business case. It also set a challenge to think across departments and operational or jurisdictional boundaries. This could be achieved with:

i) An enabling financing framework, which

- Includes all actors and level, especially the poor;
- Promotes and re-directs financing for green business and green investments (e.g. PPP schemes, regulations, pricing of externalities) along certain green parameters;
- Utilizes public resources;
- Overcomes hindrances around identified risks of green investments.

ii) Greater skill in financial management, by

- Strengthening the ability of local governments and other city actors to analyze, prioritize and plan financial portfolio towards green investment projects;
- Basing decisions upon strategic planning with fact-based approach to assess options integrated across agencies (e.g. transportation, land planning...) and is transparent to benchmarking;
- Planning and implementing projects inline with an integrated sustainability vision of the city;
- Accounting and evaluating the natural environment in a consistent manner (e.g. improvements in resource efficiency and ecosystem health, and reductions in pollution, find reliable quantitative information on the environmental performance of city-level green initiatives (e.g. impact of cycle lanes on fuel consumption, impact of water recycling on fresh water demand etc);
- Ensuring the credible interaction with the private sector.

iii) Greater knowledge and skills in the evaluation of green business and green projects, by

- Enhancing the ability to plan and assess new projects and the performance of existing and past initiatives (eg pre-feasibility studies, efficiency improvements, pollution reductions, improvements in ecosystem health, business cases and pilot projects explored);
- Enhancing the financial and economic understanding of the context, especially in developing countries (e.g. ability to prepare and assess development proposals, properly assess initiatives on a risk and cost/benefit standpoint);
- Accounting for economic externalities and purge perverse incentives.

iv) Innovating and sustaining businesses and project start-ups, by

- Encouraging strong leadership and ownership;
- Providing supportive mechanisms for cross sectorial planning and innovative partnerships (e.g. dedicated agencies and staff, PPPs with communities);
- Balancing risk and rewards between public and private actors.

v) and at the business case level providing greater transparency by

- Ensuring the private sector accounts the internal rate of return and occurring externalities;
- Ensuring the public sector embeds also non-financial benefits.

3.4.3 Effective governance and institutions

Actors at local and national level are dealing with (or are contributing to) the transformation to a green economy on the ground. Such actors represent both the formal or informal sector, and the public or private sphere. The public sector (national and local governments) plays a lead role by creating the framework and shaping the policy settings in which regional economic policy, production, consumption and transactions between private enterprises and households take place. The private sector is a key actor in terms of investments, production and finance. Individuals and private households are important in terms of consumer and market behaviour and lifestyle choices.

Individual consumption choices, the mode of production by companies, and the governance of the city are all important dimensions of the urban economy. Each plays a pivotal role in reducing the use of natural resources in the production of goods and services; reducing waste and pollution; and transitioning to a low-carbon or carbon free economy. To achieve this rapidly, environmental, resource and socially friendly actions need to be economically rewarded, rather than penalized.

Due to the multiple overlap of actors' activities, stakeholder involvement is important to develop effective green urban economy policies and city development strategies. It follows that local governments, operating at the level of governance with direct contact to citizens, play only one role, but so do businesses, citizen groups and other stakeholders. It calls for, at the very least, a regional or subnational governance leadership. In many cases this is driven through inter-governmental approaches (for example through feed-in tariffs, regulations, but also incentive structures). However, the role of businesses, as for example with CSR or new green product development, should not be understated. This calls for a greater investigation into governance structures for the city and city-regional level to facilitate the transition.

Local actors (including business, civil society and government) have the ability to facilitate and realize the opportunities that arise in the transition to a green urban economy. Local governments need to create the desired conditions that firms and businesses require to set up operations in a particular urban area. Local governments can achieve this by passing resolutions, adopting plans, preferential treatment (including financial) for green sectors (Special Economic Zones etc.), and establishing programs or departments to deal specifically with the new green economic trajectory.

For example urban form and design play a key role in realizing infrastructure and service efficiencies. Cities can be designed, planned and managed to limit resource consumption and carbon emissions for example through higher densities and reducing sprawl. An understanding of the dynamics between urban form and resource use also ensures smart city growth which avails of the structural, integrative and technological potential of urban centers.

At the city level this implies the development of strategic alliances and partnerships, as well as the institutionalization of new processes for these approaches. It may imply changes to old or the creation of entirely new institutional structures, policy and planning instruments, and tools and models. In

cases this will require changes to the administrative and legislative framework of local governments by supra-local governance structures. For successful scaling up, lessons learned need to be translated to the national government for policy development and creation of enabling conditions. Examples and experiences from a diversity of actors are a valuable asset. Knowledge of urban sustainability practice is a valuable resource across places and actors. This could be achieved

a) when at the level of governance closest and with direct contact to the local level, by

- Strengthening the capacity of local governments to integrate citizens and other city actors, including the private sector, in the shaping of frameworks and policies that enable local action;
- Developing through local governance a Green Urban Economy strategy.

b) with an enabling multi-level governance framework from higher tiers of government for effective policy and institutional design and implementation at the local level, by

- Including the principal of subsidiarity (local mandate and self-government);
- Developing through consultation a national Green Urban Economy strategy;
- Ensuring that sufficient capacities and resources at the local level are available to implement a Green Urban Economy strategy;
- Assigning and strengthening clear coordination and competencies of national, regional and local government;
- Making best use of conditions provided by higher tiers of government, without being dependent upon these;
- Avoiding conflicting mandates and parameters imposed from above.

c) with cooperation within and between city actors (private and public) and city governments to share pioneering experiences national and internationally, by

- Recognizing and strengthening the role of city-to-city partnerships and cooperation and city networks for systematic exchange of experience and knowledge towards sustainable cities.

d) by informing and contributing to global agreements and targets, by

- Recognizing cities and local governments as key players in shaping and implementing the Green Urban Economy transition at the local level;
- Recognizing contributions already made to meeting international and national agreements and targets.

3.5 Measuring impact

Key impacts should be around reductions of resource use (input), pollution and waste (output), and financial savings or returns (eg time savings) as a result of the changes introduced. It can be extended to assessments of supply chain and environmental risk reductions. Measurements to monitor the transition of the urban economy can be based upon the goals (see 3.2). Assuming that definitions are established of what constitutes “green”, measures could include:

- Number of green industries/services created, total number of green industries/services, percentage of city GDP, percentage of GDP growth;
- Number of green jobs created, percentage of total number of city jobs (depending upon definition);
- Number of trainings and education programs (green skilling) provided to low-income groups;
- Number and extent of new green partnerships for symbiotic relationships;
- Economic value of renewable energy consumed in the city, percentage of overall energy consumption;
- Resources and financial savings in urban sectors (buildings, transport, waste, water etc);
- Identification of economic and environmental benefits through assessments;
- Value of urban ecosystems (financial eg carbon storage or source of livelihoods, and use value eg. recreational areas);
- Number of green patents developed in city, number of students/researchers in green technology/green business field in city;
- Number of green consumer groups/NGOs in city.

Examples of detailed performance measures include Australian Bureau of Statistics published an Information Paper: "Measuring the Green Economy in Australia", OECD's "Monitoring Progress: OECD Indicators", US Department of Commerce, Economics and Statistics Administration (2010) "Measuring the Green Economy".

3.6 Summary

The Green Urban Economy calls for a principle re-think on how a city, an organization or individual can operate more environmentally optimal while yielding the same return of capital investments (of whatever kind) or greater performance with the same capital input while reducing environmental degradation and achieving socially desirable outcomes.

The identified approaches for urban actors focus on technological innovation, green business and governance models and green business opportunities. It embodies a challenge for local governments and city actors to develop entirely new instruments (eg carbon trading in Tokyo) and to apply existing instruments in a new way (eg providing city properties to buyers, which guarantee high energy standards). In the process the approaches seek to create:

- New growth pole for and in cities.
- Contribute to economic recovery of cities, by enhancing competitiveness.
- Decent job creation in cities.
- Create dynamic new industries, quality jobs, income growth while mitigating and adapting to negative environmental change in cities.
- Reduce threats of food, water, and energy security; safeguard ecosystems; avert climate crisis, and reduce the impacts of environmental degradation on the urban poor.
- Investment of stimuli into energy efficient technologies, renewable energy, public transport, sustainable agriculture, ecotourism, sustainable management of natural and ecosystem resources and biodiversity... in cities and by local governments.

Economic activities can be greened through a variety of approaches and each actor in their own ways. However, these opportunities are still not sufficiently known, common and established. Its success will greatly depend upon the channels of outreach, information collected, developed and innovated, and made accessible via knowledge hubs, education and training.

Greening the urban economy requires a broad, all-encompassing socio-technical change. Such change requires strong vision, the articulation and discussion of the vision towards mobilizing resources and coordinated actions. This can be achieved for example through delivering more services with less long-term capital, such as by:

- Greater cost-effectiveness (in provision and usage);
- Addressing inefficiencies (housing, energy, water...);
- Better and long-term cost models in e.g. housing;
- Deployment of more cost effective environment-friendly technologies e.g. RE;
- Investments in e.g. water piping to reduce costs from water loss.

In the process it should contribute to for example:

- Cleaner local environment through more environmentally sound economic activities (technology, processes);
- Improved living/working conditions through lower pollution;
- New products and skills;
- Access to resources (e.g. decentralized energy, greater utility services, new local produce i.e. the productive city).

Currently however, only individual or isolated examples exist, which are considerably ahead of others. Tools (e.g. economic models/valuation) to support local decision-making often not sufficiently known, beyond a limited number of countries and organizations to make informed and compare decisions affecting resources, income streams and expenditures/ costs inform management options. These are important, because monetary units are readily understood by decision-makers and the lay-public. They are important for budgets and priorities for spending of organizations (public and private). Measures of potential interest to local decision-makers include Payments for Environmental Services (PES). IN sum, environmental and economic sustainability dimensions are not sufficiently mainstreamed (e.g. housing).

The rate of impact can be relatively quick, as for example with green procurement (eg Reykjavik), or more long term (eg Hannover). It will require a series of examinations and evaluations on institutional structures, resource and financial returns over time. It will require the building of capacity and technical expertise to implement the ideas, as well as the development of strategic alliances and institutional responses to drive the process.

4. Operationalizing the Green Urban Economy: The how to

4.1 Three approaches to green the urban economy

In achieving the principle goals detailed above, various approaches or models are needed that can drive and resonate among all economic actors in cities. For an approach to resonate among these actors approaches need to be situated within, consider or be contextualized by economic mechanisms and dynamics.

For the economy to respond, any approach needs to allow for the economic processes of capital and value transformation across urban sectors like housing, water or transport, and across actors like local governments and businesses. Any approach has to call for a principle re-think on how a city, an organization or individual can operate more optimally by yielding the same return of capital investments (of whatever kind), or greater performance with the same capital input while reducing environmental degradation and achieving socially desirable outcomes.

The changes in the urban economy will become increasingly evident as new opportunities will be presented by the global shift towards new technologies and greener markets on the supply side (new products and services such as the development of green industries and the supply of green products and services) and on the demand side (improved return of investments through changes in demand, such as from resource prices, subsidies, public awareness).

The following core approaches have been identified in order to green business and operations within an economic setting. These apply to any city actor in unison as well as for strategic alliances and for urban development.

4.1.1 Technology Innovation

Technology innovation through investments in research, development and innovation in environmental technologies offer great potential for future returns of investments for example in new productive utility service technologies (eg solar, wind, geothermal etc), but also in other areas like Smart Grids, or Smart Meters. For example “according to Cleantech Venture Network (www.cleantech.com), \$5.18 billion was deployed for clean-tech investment in global markets for 2007.”⁴² Regulatory uncertainty is however also a hindrance for its deployment. However, technology innovation, promotion and its deployment needs to be locally appropriate development.

Environmental technologies are rapidly growing. Technology for example for retrofitting the existing urban fabric, developing waste to energy, water savings, digital economies, smart transport systems etc, is important for establishing more eco-efficient cities, solar cities, smart cities, etc. Cities can be viewed as a site for production beyond the conventional goods and services. A great array of opportunities exist to use idle spaces for the production and utilization of renewable sources food, biomass or energy via wind, solar etc. Examples of a more productive city can be geothermal energy, solar panels in windows, green spaces on roofs and walls etc (see Bruggmann, 2012).

The application of technologies, such as utilizing solar energy or energy efficiency measures alone can bring financial returns. Technological innovation can yield returns through higher performance efficiency, savings in capital input for production or operation, as well as using or harvesting spaces or renewable resources in new ways. Being the most attainable results from investment into research and development, such returns are commonly known as the low hanging fruits.

Scaled economies can be supported through various policies. In many cases business and market inertia needs to be overcome, where policies play an important role, especially in price distorted markets. In many cases however it may not even be needed once a sufficiently large market has been established. The innovation of technologies also overlaps with the other approaches. These approaches are inter-related by complimenting each other, rather than being principally separated (see 4.2).

⁴² <http://www.forbescustom.com/EnvironmentPgs/NewGreenBusinessModelP1.html>

This could for example be found in a gradual shift from conventional industries in favor of clean technology. Many industries, it is envisaged, particularly energy intensive activities, need to evolve their technologies and green business models and opportunities (see 2 and 3 below).

4.1.2 Business/Governance Model Innovation (Green Business Models)

The supply of goods and services can be optimized. In a competitive environment where there is pressure to control costs and maintain operational efficiency, opportunities are especially relevant to innovate and create new business models to be more competitive. Through the exploration and application of a different business case, existing services and products can be greened, while still yielding same or higher returns.

This can occur through the “management of the customer’s production, innovative business strategies and business to business relations reducing either energy consumption, resource use or waste, thus creating economic and environmental benefits for both supplier and customer – a win-win situation” (Green Paper, Oct 2010, Green business models in the Nordic Region: A key to promote sustainable growth, Danish Enterprise and Construction Authority, Norden, Fora).

“Green business models are business models which support the development of products and services (systems) with environmental benefits, reduce resource use/ waste and which are economic viable. These business models have a lower environmental impact than traditional business models” (Green Paper, Oct 2010, Green business models in the Nordic Region: A key to promote sustainable growth, Danish Enterprise and Construction Authority, Norden, Fora). It has to be noted that in this model the element of social and human development is not clearly included, possibly as a result of it being drawn from a northern/mature market economy context. Subsequently the idea of green and decent jobs in the implementation of such models needs to be included and accounted for.

The business model presented in the Green Paper identifies the following important principal advantages:

- Generate solid business cases and jobs on a market that is expected to grow.
- Lead to significant lower environmental impacts.
- Serve as a catalyst for innovation in search for delivering the same or better services with the use of less resources.
- Support company branding - often both for the supplier and the customer.
- Increase motivation amongst workers, a key component in attracting and sustaining the brightest minds now and in the future.

Further examples are listed in the EU Commission’s *Innovate Business Models with Environmental Benefits*, 2008. It states “innovation in business models that reduce resource use has the potential to create multi-billion euro markets in the EU and overseas and bring very substantial environmental and economic benefits”. It can capture potential incentives, and improve risk management. It embodies a consideration for the entire supply chain, where businesses not only take account of their own environmental impact but also consider the practices of their suppliers and clients. In the process of reviewing supply chains risks of various kinds can be mitigated, while operations are optimized.

The EU Commission’s *Innovate Business Models with Environmental Benefits* highlights the opportunities to different actors as follows (ibid):

- **Business leaders** can find opportunities to profit by investigating:
 - Existing technical capacities or knowledge that is capable of saving resources, but which is not utilized by existing business models.
 - Possible wins that could be realized and shared in a partnership relation with customers and business partners.
 - Opportunities for selling outcomes, rather than products.
 - Willingness to pay for intangible values such as eg reputation for sustainability.
- **Policy-makers** can also support the development of such models:

- Take environmentally-friendly business models seriously as a means to achieve environmental and innovation policy goals.
- Shaping regulation to give greater incentives for reduced resource use and lower unfair competition from subsidized resource use.
- Checking existing regulation to remove blocks to the delivery of outcomes (rather than products) by businesses.
- Examine the potential in their region, using knowledge of local culture and economic conditions to assess the drivers and barriers.
- Setting up non-profit organizations documenting benefits, commercial and environmental, and spreading knowledge about specific models.
- Secure a flow of outcome-based deals to reduce market insecurity, either through public purchases or through regulation of private companies.
- Make existing networks and infrastructure accessible to companies that need them to make their business model operational.
- Business associations could break down barriers to uptake through the promotion of knowledge of such approaches through business networks.

This can occur at the organizational level (by seeking cost savings, efficiencies, improved science eg cost modeling and cost factors, risk assessment and management) as well as at the level of the urban economy.

It may involve the transition of individual companies and public organizations towards lower resource consumption and pollution/emissions. At the simplest level it can be achieved through green purchasing and procurement practices. For example, through new financial models (polluters/progressive consumer pays principle) more effective pricing models can be achieved in resource pricing and user fees. This can apply to peak users and large consumers of land-use, transport, water and energy etc. Through such pricing mechanisms, the same or higher returns can be achieved, while resource use is reduced.

It can also involve the internalizing of negative externalities and relieving subsidies for carbon intensive activities. Amongst other approaches, it involves the re-evaluation of cost-benefit analysis to include externalities and unaccounted values, also over long time periods, and allowing for market mechanisms for pollution/overexploitation reduction. A level playing field is desirable sooner rather than later, so prices need to reflect the real costs of production, which means internalization of costs.

New management and governance structures can also be created for greater economic and environmental performance. At the level of the urban economy, integrated planning for sustainability by ensuring civic engagement (empowering citizens) and introducing efficiencies, innovation processes and interactions can be a stepping stone to realize new opportunities and resource use optimization ie creating/strengthening clusters for efficiencies and innovation (eg CleanTech NRW, industrial symbiosis, at and between the firm and organization level). The way a city is planned enables or hinders the more capital efficient delivery of services like housing, transport and wired and piped infrastructures ie the urban form, energy and resource use synergies. Local governments have a role as a facilitator of action, and as a creator of conditions, amongst others (see 4.2).

4.1.3 New (Green) business opportunities

Simultaneously, the demand for changing consumer preferences and behavior is important in order to increase demand for and therewith the supply for green products and services. World-wide green business is rapidly increasing with ample new product and service opportunities (see example *Ten Green Business Ideas for New Entrepreneurs* by GreenForAll ⁴³). Green business can cover cleaning services, eco-tourism, entertainment, home and office services, manufacturing and wholesale, personal services, media, food, retail, services, buildings, and finance ⁴⁴. Economic activities can also shift to new areas and thereby green their activities in a number of ways (for example towards leasing, repairing, retrofitting, upgrading etc). This embodies a long term driver to environmental sustainability.

⁴³ <http://greenforall.org.s3.amazonaws.com/pdf/cap/10%20Green%20Business%20Ideas.pdf>

⁴⁴ <http://ecopreneurist.com/2009/07/31/green-business-opportunities-for-aspiring-eco-entrepreneurs/> (Cooney Scott 2011)

Advances in green business can also be achieved through the application of business models to environmental and natural resources to better account for them and their economic value, in order to make more informed management decisions (eg Ecobudget).

4.2 Local actors, responsibilities and roles

An urban economy is made up of a great diversity of both informal and formal actors. Each has an important role to play. The private sector is a key actor in terms of capital; private households and individuals are important in terms of market behavior and lifestyle choices; governments are important as they set most of the framework conditions in which production, consumption and transactions between firms and households take place. Governments also have a key role in steering urban development.

At the same time, due to the multiple overlap of actors' activities, stakeholder involvement is particularly important to develop appropriate and effective green urban economic policies and city development strategies. Correspondingly, the role of local governments, the closest level of governance to citizens and local stakeholders, has a particular significance.

Table 10 Illustration of a DPSIR-framework for GUE by principle actor

Actor	Driver (activity)	Pressure on environment	State (condition)	Impact on ecological and human system	Desirable GUE response (reaction)
Civil society	Consumer choices and lifestyle (based upon endowments, values etc); Users of urban services Market behavior	Poverty, unable to select sustainably produced products (market access, availability, limited purchasing power). Limited or skewed pricing of urban service (eg subsidized fuel, lack of clean public transport, waste disposal)	Local environmental degradation of local livelihoods Air pollution through transport, heating and cooking fuels and use. Harmful disposal of wastes. Exporting of resource use and pollution to producing country.	Unsustainable use. Pollution of local environment. Unhealthy living conditions. High commuting times.	Sustainable management of local resources. Valuing and safeguarding local environment for livelihoods and reduction in health costs. Strengthening civil entrepreneurship around sustainable use and protection of local environmental resources (eg re-use, recycling). Purchasing and investing in resource saving technologies (energy, water saving in buildings) and production of renewable energy and biodiversity. Advocate, raise awareness.
Private sector	Cost and return of investment driven production. Externalizing of environmental costs. Collective action problem.	Unsustainable use of resources. Volatility of commodity prices and increasing scarcity of commodities.	Increasing price of commodities. Environmental damage and reparation payments. Corporate social responsibility and consumer accountability.	Pollution. Degradation of environment. Relative scarcity of finite resources. Undermining of own natural resource base for production. Overpriced delivery of goods and services. Costs to other actors through externalities (eg health, damage, ... with climate	Internalization of external costs. Shifting production of goods to be more resource efficient through reduction, recycling, re-use. Environmental risk reduction through corporate social responsibility. Sustainable procurement policies. Innovating new technologies. More cost effective delivery of services by saving resource wastage

				change)	etc. Investing in green businesses.
Research	Developing analytical tools, identifying risks, providing models, researching new technologies, obtaining and analyzing data, setting agenda and providing expertise, collaborating.		Environmental considerations not sufficiently mainstreamed for example in economic modeling, finance and economics.	Shortages in knowledge dissemination.	New collaborations to disseminate and develop new knowledge.
Local government	Self-govern own infrastructure; Serve as role model: Provide information and raise awareness; Operate municipal infrastructures; Regulate; Set common targets and city development vision.	Urban sprawl leading to degrading and fragmentation of ecosystems, productive land and makes delivery of utilities more expensive. Poor provision of utilities (water, waste, energy, transport etc) leading to leakage, pollution etc. Poor provision and enforcement of regulations eg building codes, land-use. Skill and capacity for green development in planning, administration and investment.	Lower quality of living. Degradation of local environment.	lack of adequate planning; exacerbates the environmental problems; lower quality of living and less attractive as a place for investment/ corporate location; higher resource wastage and unnecessary higher costs of delivery; susceptibility of the urban; economy to price volatility of commodities.	Sustainable procurement and green investments into municipal operations; Economic assessments of projects that include environmental and social benefits (externalities); Providing support to local businesses and civil society. Providing an enabling framework condition. Establishing partnerships and motivating change.
Other government	Perverse subsidies. Lack of leadership and commitment. Uncertainty around policy development.				Provide financing, implement a national enabling framework national planning; national framework. legislation, standards, planning; Fund and finance research and innovation i.e. Japans NEDO and support with national incentive programs.

4.2.1 Civil society

A strong proponent of any policy, plan or strategy is public participation and citizen consultation. This resonates highly in the context of cities transitioning to a Green Urban Economy. It has been mentioned that local governments can be key facilitators in terms of public involvement and this is true. However, citizens and communities can also be the source of bottom-up approaches to implementing the Green Urban Economy.

Urban habitants are that would make a city live. They can be considered to fulfill three roles in an urban economy, in addition to being labor capital providers. Firstly, they are consumers and users of urban services. Secondly, and relatedly they fulfill their lives in a diversity of lifestyles according to their abilities, values and choices etc. Thirdly, people, their ventures and behaviors also form around the market and the state in a diversity of ways. For example, through collaborative approaches of the civil society they contribute to local development, production, knowledge sharing and financing. Entrepreneurial examples show a civic economy, which generates local goods, services and common infrastructures. Civil entrepreneurship can contribute to shared local prosperity⁴⁵ outside of traditional forms of production and consumption.

For example: “From local food growing projects to sustainable supermarkets, community waste-to-energy plants to cooperative telecoms services, these initiatives are having a tangible impact on social interactions and economic opportunities in cities, villages and towns. They are even influencing the physical shape and appearance of these places, changing the way they are designed, built and used.”⁴⁶

Urban inhabitants need to be attracted to green products and services by purchasing these (eg installing smart meters, investing in energy efficiency measures, purchasing greener cleaning products, recycling waste, taking ecomobile transport options, disposing household wastes in appropriate places, saving water etc).

For this to occur, civil society needs to be aware of and informed on the options available to them, and understand the advantages and benefits of green products and services, as well as the dis-benefits of environmentally unfriendly products.

Civil society needs to be actively involved and engaged, especially when policy changes are being discussed. Conveying the economic rationale of a viable local economy builds confidence in local products and services. This ensures a greater demand for such products, therefore maintaining local jobs and employment while reducing demand for carbon intensive imported goods.

Public involvement garners a sense of support and ownership of a particular policy framework, where local governments are strongly interlinked with the citizens that they strive to serve. This participatory approach to local decision making and institutions harnesses the potential of local communities, where a Green Economy must ultimately begin.

4.2.2 The private sector

The role of the private sector is essential for technological advancement, expertise and knowledge services, finance, and producing goods and handling wastes in a more sustainable manner. Private sector finance is important in terms of investment for new startups, Small Medium Enterprises (SMEs), green market development and investments in green infrastructure. In a developing country context this is also important as local governments may not have the human or financial capacity needed to overcome the initial barriers for transitioning to a Green Urban Economy.

Private sector investment is fundamental to the development of green clusters where clean tech and green service and product orientated businesses. Private sector innovation and investment is essential to create green jobs and new green industries. Businesses also add to the concentration of expertise, innovation and specialization in urban economies and are an essential beacon to other firms and enterprises to set up operations in a particular urban agglomeration.

Private sector innovation and investment must capitalize on the opportunities presented to them by the global economy and the urban economy, where an increasing market share for green products and services and new business opportunities become available. New business models are gradually

⁴⁵ Compendium on the Civic Economy, 2011

⁴⁶ Compendium on the Civic Economy, 2011

evolving whereby the production, consumption and distribution create new opportunities for the return on investments.

4.2.3 Research, science and others

Research and development is essential to advance knowledge, technology, information and data, and to challenge the existing knowledge basis. For example research and development is increasingly challenging the myth of a trade-off between environmental investments and economic growth, and makes central the roles of cities in an emerging 'green' economy. Research, development and innovation play an important role in providing policy, business, and action options, as well as identifying economic (and social) challenges that need addressing.

Collaboration with academic and technical research institutes provides a key link between the latest technological innovations and the development of green business and smart growth sectors, and policy innovation on what works and what does not. Research is also essential in the identification of best practice.

4.2.4 Local government

The role of local governments is manifold. They have the responsibility for local policy making, urban and planning and management. They can drive local policies and processes that address climate change, air pollution, biodiversity loss, land use degradation, water dynamics and chemical and waste issues. In consultation and cooperation with stakeholders there exist a variety of approaches that local governments can in principle realize. For example, they are important for⁴⁷:

- **Own municipal operations (company level):** sustainable procurement, energy efficient public buildings etc.
- **Provision of public utilities and infrastructures (community level):** increasing resource efficiency in utility service, management of infrastructures like transport, changing energy matrix, waste management improvements, investment in green area preservation, water tariffs, etc.
- **Enabling others:** voluntary action, acting as role model, providing information, setting incentives etc.
- **Using legal and jurisdictional mandate:** providing regulatory and policy framework, building codes, congestion charging, land-use planning, development strategies etc.
- **Setting targets and measurable outcomes:** Baseline information, data collection, measuring success etc.

The institutionalization of sustainability through a department or other organizational structure, with a particular mandate, can systematize the drive towards urban sustainability. By further interweaving such bodies into broader process initiatives can be more effective⁴⁸. In many places across the world, processes have started, societal goals are being requested, integrated thinking is promoted, and action is being encouraged.

It has been shown that in urban areas local governments can do this in a business savvy and economically viable way, which results in positive environmental and social returns. In the process they can drive sustainable development through their own municipal operations' economies and in the urban economy they govern. Local governments can for example use the following instruments:

- Procurement and purchasing (how tax payers money is spent) by including environmental and health criteria (eg green purchasing and green procurement).
- Investing and review business models of municipal operations (eg building operations and management, fleets etc) for example increasing the amount of local renewables in the energy provision for citizens, facilitating job training on installation technologies,

⁴⁷ Based upon Bulkely, H & Kern, K 2006, Local government and the governing of climate change in Germany in Germany and the UK, Urban Studies, vol.43, no 12; Martinot et al 2009, Global Status Report on Local Renewable Energy Policies, REN21 Renewable Energy Policy Network, Institute for Sustainable Energy Policies (ISEP) cited in ICLEI, 2010, Cities in a post-2012 climate policy framework, Bonn, Germany.

⁴⁸ ICLEI, 2012, Local Sustainability 2012 Case study series: Showcasing progress in local sustainability, ICLEI Global Report

- Maintain and find new economic opportunities to maintain or restore green areas (parks and gardens, ecotourism) (eg by drawing upon EcoBudget), eco-tourism, urban agriculture, nature stewardship schemes.
- Promote business opportunities by creating spaces for information exchange and networking with fairs, trades, events, use open spaces, buildings such as large venues) and cooperation with industry (eg by implementing EcoProfit).
- Invest and review business models of utility services provisions (eg energy, water, heat, social housing etc)
- Provide regulations and policies (incl fiscal) to change incentive structures also in land use planning/city planning/land use, regulation, statutory requirements and conditions ie emissions. For example economic and financial instruments to advance low carbon development and resource efficiency such as the Tokyo Carbon and Trade program. Other initiatives can include congestion charges, strategic development plans, EcoMobility options, and public transport services, the provision of by-laws that deal with infrastructure such as buildings and renewables energy requirements, environmental performance etc.
- Economic structures (eg promotion and attraction of green industries and the promotion of ecotourism).
- Encourage research and development for designing new products, technologies, services and operational models to transform or innovate the local economy, for examples: Smart bike and car sharing technology systems, smart meters, smart grids.

4.2.5 National and international actors

Local sustainability processes operate in a vacuum between globalized economic activity and an insufficient protection of natural and human resources through national and international policy-making⁴⁹. Local governments depend upon the enabling framework conditions set through higher tiers of government. For urban sustainability action to be effectively implemented policy, legislative and organizational change may often be necessary at various government levels⁵⁰.

International coordination can also play an influential role. They can facilitate interaction and run international initiatives. This can be done at UN level and in other forums of discussion including the NGO and LGOs sectors. The first approaches have already been discussed in section 2.3 and 2.4 above.

Supra-local governance frameworks can provide very powerful means to enable and support local actions. These can be achieved for example through: a nationally driven, locally responsive incentive linked process; amendment of higher tier governance acts and statutory reforms to enable local innovation; setting the supra-local legislative and institutional frameworks; or simply recognizing a city's improvements through award recognition (see ICLEI 2012).

4.3 Urban entry point: Local government leadership and examples

What and who is the most significant entry point into a city to advocate for a transition to an urban green economy? Who is best addressed to raise awareness and implement the three principle approaches to green the urban economy? The answer can be very divergent depending upon whom one asks. However, section 4.2 makes clear that all actors have a role to play.

Local governments are often the best placed to lead a Green Urban Economy transition. They are elected, accountable to local people, interact with local businesses and recognized by regional and national policymakers. They have in principle the basic capacity to provide local services, many of which are relevant to local employment and development. They are also responsible for urban planning and city strategies, and act as conveners.

⁴⁹ ICLEI, 2012, Local Sustainability 2012 - taking stock and moving forward, ICLEI Global Report

⁵⁰ ICLEI, 2012, Local Sustainability 2012 Case study series: Showcasing progress in local sustainability, ICLEI Global Report

Table 11 Local authority commitments to support a green economy (APSE and Infrangilis, 2012)

Government will develop a green policy framework which:	Business should work with Government to:	Local authorities shall establish a strategic vision for the greening of the economy in their area which:
Is effective, clear, stable and as streamlined and minimally burdensome as possible Encourages investment Protects existing investments, where possible, through use of 'grandfathering' (protecting pre-existing rights)	Explore voluntary approaches to greening products and services Identify areas of green policy and regulation which can be streamlined whilst remaining effective Invest in greener products, services and production processes	Provides local leadership Fosters partnership working with government and business Identifies areas for investment in low carbon regeneration (e.g. offering clear direction via LDF and Regeneration Strategy)
Promotes the UK as a global leader in green exports and encourage green inward investment	Help government publicize the skills and expertise of UK-based business	Helps Government publicize the skills and expertise of UK-based business (e.g. showcase achievements through APSE publications and events)
Provides accessible advice and support to enable business to increase their resource efficiency, resource security and resilience to climate change	Become increasingly resource efficient and builds risks of energy/resource security and climate change into future business planning	Becomes increasingly resource efficient and build in the risks of energy/resource security and climate change into future business planning (e.g. launch a low carbon business network in partnership with the local chamber of commerce)
Ensures that Government 'green' policies take into account the competitiveness of UK-based companies, including Energy Intense and develop measures to support businesses most hit by transitional costs.	Continue to explore production processes and business models which reduce use of resources and carbon emissions	Helps local businesses explore production processes and business models which reduce use of resources and carbon emissions (e.g. launch a low carbon business network in partnership with the local chamber of commerce)
Ensures the skills system responds to the demand for skills created by a shift to green economy	Help articulate skills demand through involvement in LEPs, and Sector Skills Councils	Helps articulate skills demand through involvement in LEPs, and Sector Skills Councils
Supports the development of greener products, services, and technologies, through continued support for R&D and innovation	Design, develop and promote greener products and services, including enabling technologies.	Designs, develops and promotes greener products and services, including enabling technologies (e.g. pilot smart electricity grids and trial cutting-edge street lighting techniques)
Encourages investment in infrastructure supports the green economy, including through the Green Investment Bank	Invest in infrastructure that will support the green economy	Invests in infrastructure that will support the green economy (e.g. green spaces, local transport network and district energy systems)
Enables UK-based businesses to compete in green, low carbon supply chains where the UK has expertise.	Work together, where possible, to help build UK-based supply chains	Work together, where possible, to help build UK-based supply chains (e.g. establish a LECZ with business clusters).
Produces products that meet cost-effective sustainability standards	Adopt sustainability standards for their procurement	Adopts sustainability standards for their procurement (e.g. adopt the APSE Sustainable Procurement Toolkit)
Help businesses understand the value of and their impact on the natural environment.	Consider the value of the natural environment to their business	Help businesses understand the value of and their impact on the natural environment (e.g. develop a climate change action plan for the local area that business are asked to sign up to through the LSP or LEP)

While developed for the UK context, the table highlights the importance of the national level in providing a Green Economy policy and institutional framework and the close interaction of the private sector.

The following experiences and cases illustrate examples of initiatives that can be framed by the presented Green Urban Economy concept. Tokyo illustrates technological innovation. Hannover illustrates a comprehensive change in management of the city. Reykjavik illustrates the power of green procurement. Singapore and Kumasi provide examples for the identification and assessment of pricing natural resources. Portland shows the opportunities of retaining and building on new business opportunities (see table below).


							
Approach	Urban sector, operation or space	Instruments/tools		Actors and role of local governments			Green Urban Economy Goals
	Approach	City	Theme	Example instruments	Example actors involved	Local government action	Principal goals
1	Technology innovation; Business/Governance Model Innovation, Business Opportunities	Tokyo	Green buildings and energy efficiency	Environmental performance of buildings analysis and building regulations; Cap and Trade	Tokyo Metropolitan government, chamber of commerce, private sector developers, etc.	Undertook participatory process with various stakeholders, creating the required statutory framework.	1; 2; 3; 4; 5; 8; 9
2	Business/Governance Model Innovation	Hannover	Urban development (buildings, land use, etc)	Merging economic and environmental departments; Integrating environmental considerations into economic development framework through a variety of instruments eg building regulations, provision of loans, energy saving standards, Ecoprofit	Strong local government leadership	Established a single department for environmental and economic administration, planning framework etc.	holistic
3	Business/Governance Model Innovation	Tubigon	Resource management	EcoBudget, accounting of natural resource base; political steering of local natural capital	Strong local government leadership	Local government and council	7;9
4	Business Model Innovation; Business Opportunities	Reykjavik	Cleaning services	Integrated environmental criteria into procurement and tendering processes created demand of and greater supply of green cleaning services.	Local government and cleaning service providers; private sector responded to new demand	Established environmental criteria in the procurement, choose a Nordic Swan accredited company, influenced the market.	1; 2; 5;
5	Business Model Innovation	Singapore	Water	Resource consumption incremental tax on water (proportionally higher the higher the water use)	Local government and private citizens through behavior change	Set a strong tariff system that was fair as it taxed levels of consumption rather than flat rates	1; 5; 9
6	Business Model Innovation	Kumasi	Urban forestry	Hedonic price model, carbon credits and Willingness to Pay; identifies lost opportunity costs.	Research based	Research	9
7	Business/Governance Model Innovation; Green Business Opportunities	Portland	Green industries and clusters	City Development Strategies namely the Economic Development Strategy; establishment of new bodies; retaining and attracting new businesses	Local government, strong leader role, the private sector specifically those that are involved in green service and products and clean tech sectors.	Long term strategy development for sustainable growth, creating an Economic Cabinet, involved private sector	holistic

Figure 8 Illustration of approaches of Green Urban Economy by example

4.3.1 Tokyo: Building technology innovation for energy efficiency

New technologies, including building technologies, are essential innovations to ensure resource and energy efficiency while simultaneously availing of new business opportunities that value the environmental performance of buildings. Tokyo's Green Building Program and the Cap and Trade Program have been two major progressive instruments that have created demand for energy efficient buildings. They reduce the carbon footprint of both existing and new commercial buildings in the city through energy efficient building technologies.

In the preparation process of both programs, the Tokyo Metropolitan Government (TMG) undertook a participatory process with businesses, industry groups, environmental NGO/NPOs, academics and engineers etc. Both programs provide a statutory framework to ensure energy efficiency in buildings. Approximately 1,340 facilities are covered by the Cap and Trade Program and a 6 to 8 percent reduction requirement applies during the first compliance period (2010-2014) and a prospective 17 percent reduction requirement during the second compliance period (2015-2019). The exact reductions achieved by the Cap and Trade Program are yet to be calculated since the program's first compliance period ends in 2014. According to the Bureau of Environment (BOE), approximately 59 percent of the targeted facilities can be expected to comply with their reduction obligations.

If a facility exceeds its reduction requirement the excess reduction is issued as a credit that can be sold on the created market. Through this a new governance model has been established that is based upon market mechanisms. Businesses respond and can adapt their business models according to new financial models that the cap and trade system has created, stimulating economic activity. Such new businesses can include consultations on acquiring emission reduction credits for energy efficiency measures by small and medium-sized business facilities and for the validation and trading of various credits. This ultimately impacts on the market, whereby an incentive is created to produce and sell eco-efficient products.

Since 2002 the Green Building Program has covered more than 1,300 buildings. The program sets requirements to owners of newly-built buildings with over 5,000 m² total floor area. Owners and developers of such buildings are required to construct buildings that incorporate environmentally friendly designs based on the TMG's green building design guidelines. The owners must also prepare Building Environmental Plans explaining and rating their environmental designs, (based on the TMG standards), and submit these plans one month prior to building permission applications. The most recent version of the program, implemented in 2010, seeks to ensure that minimum energy performance standards in Tokyo are set higher than the national standards and a feasibility study is required when introducing on-site renewable energy technologies. This subsequently provides incentives for owners to look for innovative ways to meet the requirements.

The Green Building Program has resulted in the number of lower performance buildings decreasing, while the number of higher grade buildings is increasing. Two-thirds of the buildings under the Green Building Program exceed the thermal performance in insulation efficiency criteria provided under Japan's Rational Use of Energy Act. Examples of such eco-energy buildings include those that have plans for a large-scale installation of solar panels, new radiation cooling/heating systems and LED lighting.

Source: (ICLEI 2012a)

4.3.2 Hannover: A holistic approach to sustainable urban economic development

The City of Hannover, Germany, is the first European Metropolitan city to combine the environmental and economic administrations in one municipal department. In doing so, economic development is now strongly interlinked with of the value that the natural environment for such development. This integrative approach allows for positive economic and environmental impacts to be pursued simultaneously. It embodies fundamental green urban economic approaches particularly in terms of new business models which put a strong emphasis on environmental protection.

One example involves municipal lands and urban planning and management. Municipal plots are not sold for the highest possible price, but the contract is awarded to the tender committed to realizing the

highest ecological standards in terms of planning and design. This incentivizes construction companies to maintain stringent environment standards, and in terms of the housing sector increases market share for sustainable design and building technology. Such a criterion also has a substantial influence on the construction market in a wider urban context through the stipulations made in urban planning contracts that favors sustainable location and design. This directly ensures fresh air corridors in the city; directs housing development in close proximity to transport nodes; ensures a functional densification pattern while simultaneously protecting open space.

In terms of economic development, loans are granted to small and medium-sized enterprises that are newly founded or expanding in the environmental sector. The project “Ecoprofit” is very successful in Hannover and is a crucial tool in shaping new business models that facilitate green markets and investments. ECOPROFIT is the Ecological Project for Integrated Environmental Technology and is a program for sustainable economic development developed by the Environment Department of the City of Graz, Austria in 1991. It brings local authorities, businesses and consultants together on common training programs and networking. This enables an effective flow of information and synergies. In this cooperative project between business and the city administration more than 120 enterprises have been intensively examined for possibilities to save money through improvement measures in the areas of water, energy, waste etc. There is an intensive benchmarking process taking place between the firms through which enterprises gain the possibility to involve themselves in operational environmental protection, therefore playing an important part in environmental and resource management.

Source: Mönninghoff (2012)

4.3.3 Tubigon, Philippines: EcoBudget

Tubigon has experienced major threats to its natural resource base, for example by the indiscriminate use of fertilizers and pesticides, solid waste dumping (including toxic materials), shrinking agricultural lands because of population pressures, decreasing forest reserves due to illegal logging and forest fires, as well as coastal resource management issues. In response, Tubigon decided to implement ‘ecoBudget’ as a framework for local environmental management in order to enhance its environmental governance and management capacity, thereby improving its local environment and the living conditions in its communities.

The municipality saw the potential of ecoBudget as a platform for linking its municipal vision, plans, and strategies with resource allocation and performance measures in order to promote sustainable development and alleviate poverty. Additionally, the municipality wanted to harmonize its different environmental management initiatives under one umbrella program and saw ecoBudget as a key step in that direction. The Province of Bohol intends to use the lessons learned from Tubigon’s experience with ecoBudget to implement the program in the 47 other communities in the province (as of 2008).

Similarly, a traditional accounting system is complemented by an environmental accounting system in which physical environmental quantities are measured instead of money. ecoBudget aims to plan, control, monitor, report, and evaluate the consumption of natural resources (such as climate stability, air quality, land, water, raw materials, and biodiversity) for issues of significant priority within the geographical area of the municipality. The ultimate aim is to keep environmental spending within the limits set in an environmental “Master Budget.”

The Master Budget allocates physical indicators to short and long-term environmental, and potentially social targets oriented to the sustainable management of environmental resources. Approved by the municipal council, the targets become politically binding for the entire organization. Political decision-makers and senior urban managers are involved systematically in the ecoBudget cycle, allowing political steering of the use of environmental resources.

Source: (ICLEI 2007)

4.3.4 Reykjavik: Achieving green market development through sustainable procurement

Changing behavior and demand patterns in favor of greener products and services through innovation in procurement business models creates new business opportunities. In this case, the City of Reykjavik has used sustainable procurement in public cleaning tenders as a means to facilitating green market development.

The city's Procurement Office, with support from the Environment Department, developed the Green Cleaning Program in 2009. When the main city departments were relocated to a new building a unique opportunity arose to green the city's operations. The Procurement Office's implementation team stated a clear commitment that one of the goals within the program shall be that all cleaning service providers will have to be certified under ISO 14001 or are Nordic Swan eco-labeled, or fulfill comparable criteria. Two important pilot projects were undertaken. In March 2009, the cleaning contract for the new city office building came up for tender and in September 2009 there was a tender process established for the cleaning contracts of 63 kindergartens in the city.

Following the tendering process a cleaning service provider with a Nordic Swan eco-label license won the contract. This proved to be a major breakthrough in terms of environmental protection, green cleaning and market development for green products and services. Reykjavik increased the proportion of green cleaning services purchased by the city from almost zero in 2009 to 74 percent in 2011, with 95 percent of the chemicals being eco-labeled. For example a 65 percent decrease in chemical consumption for the new office building and 33 percent from the kindergartens have been estimated. The financial gains have been equally impressive; cleaning costs have been reduced by 50 percent through the two tenders mentioned, totaling an annual saving of US\$ 770,000.

The most significant achievement of the Green Cleaning Program has been the incentive for the market to supply greener cleaning services. This successful pilot project began a wider green cleaning movement in Reykjavik and Iceland as a whole. It incentivized cleaning service providers to use environmentally friendly methods and products. The program facilitated a boom in the applications for the Nordic Swan cleaning services eco-label, resulting in a market share increase from 10 percent to 50 percent and an increase in the number of Nordic Swan licensed service providers.

(Source: ICLEI 2012)

4.3.5 Singapore: A Financial incentive for consumption and behavior change

Through financial mechanisms urban governments can influence consumption patterns and therefore enable more resource efficient service provision in cities. The case of Singapore's water demand management system is illustrative of this and is a further example of innovation of a business model in terms of water management. A progressive tariff structure was implemented in 1997 and was reviewed each year until the final standard rates were fixed in 2000 as illustrated by the following rates:

Domestic Consumption per month	Tariff (pre July 1997) in S\$	Tariff (Effective July 2000)	WCT % (Pre July 1997)	WCT % (Effective July 2000)
1-20m ³	0.56	1.17	0	30
20-40m ³	0.80	1.17	15	30
40m ³	1.17	1.40	15	45

Effective from 1 July 2000, domestic consumption of up to 40m³/month and nondomestic uses were charged at a uniform rate of S\$1.17/m³. For domestic consumption of more than 40m³/month, the tariff became S\$1.40/m³, which is higher than non-domestic consumption. In addition, the Water Conservation Tax (WCT) that is levied by the government to reinforce the water conservation message was increased to 30 percent for the first 40m³/month for domestic consumers and all consumption for non-domestic consumers. However, domestic consumers pay 45 percent WCT, when their water

consumption exceeds 40m³/month. In other words, there is now a financial disincentive for higher water consumption by the households.

Together with a 'water borne fee', average monthly consumption declined by 11 percent from the period 1995-2004 and per capita per day consumption from 172 lpcd in 1995 to 160 lpcd in 2005. This indicates that the new tariffs had a notable impact on the behavior of the consumers, and have turned out to be an effective instrument for water demand management. This is a positive development since the annual water demand in Singapore increased steadily from 403 million m³ in 1995 to 454 million m³ in 2000. The demand management policies introduced have resulted in the lowering of this demand which declined to 440 million m³ in 2004. It can be assumed that these changes have also created and supported new business opportunities in the supply of water saving technologies.

(Source: Tortajada 2006)

4.3.6 Kumasi: Valuing ecosystems

A major theme in a Green Urban Economy is a new business model that values ecosystem services particularly with regard to their economic, environmental and social potential. The Kumasi Forest Reserve is an attractive piece of urban forestry located in close proximity to the center of Kumasi, Ghana's second largest city. However, serious degradation issues in terms of natural drainage and wetlands has occurred as a result of urban expansion. A study by Quarterly (forthcoming) is an excellent example of using a hedonic price model and a Willingness To Pay (WTP) exercise to get the total economic value of the reserve in order to compare its conservation status value to the loss incurred by its displacement as a result of urban development.

The results indicated that the loss of the entire forest reserve (1600 hectares) resulted in 452,800 (283 tons per hectare) tons of carbon emissions, which at current value is US\$ 37 million in carbon credits. Furthermore, a WTP research exercise was carried out with urban dwellers that use the forest and it was concluded that the total WTP was US\$ 3,150,000. In comparison, the urban developmental potential, (based on the mean price of land, scarcity etc.), illustrated that the main developmental gain from the economic value for destroying the Kumasi Forest Reserve is US\$2.6 million. This is less than the WTP of local residents and is US\$ 35 million less than the potential cost savings if the reserve was maintained.

The results of the exercise illustrate the importance of valuing ecosystems also in terms of their economic value, combined with the environmental services they provide in terms of reducing the heat island effect and carbon sequestration, as well as providing a recreational amenity asset. It also illustrates that conserving urban biodiversity, vegetation and landscape should be an essential urban socio-economic objective.

Source: Quarterly (2012)

4.3.7 Portland: Redefining the urban economic structure

Portland's 'Economic Development Strategy' includes a focus on a sustainable growth strategy in terms of green jobs, clean tech clusters and sustainable urban planning and management. It illustrates an urban governance and management structure approach to ensure a shift away from carbon intensive economic activities towards clean tech clusters, green knowledge and services.

To achieve its ambition – to build the most sustainable urban economy in the world, Portland implemented the Economic Development Strategy in 2009. This was done in conjunction with the establishment of the Bureau of Planning and Sustainability. The strategy has three main aims. To achieve:

- Sustainable job growth (economic sustainability),
- Sustainable innovation with Eco-Districts (environmental sustainability),
- Inclusive prosperity (social sustainability).

An 'Economic Cabinet' was established which consisted of leaders from all facets of the local economy including the city's target clusters which include: clean tech, software, research and commercialization, athletic and outdoor industries, and advanced manufacturing. This body acted in an advisory capacity to the Mayor's office, while the Portland Development Commission was tasked with implementing the strategy.

Portland's efforts have resulted in an estimated US\$ 355 to US\$ 960 million in annual wages from the green building cluster in 2008. Additionally, bicycle related industries accounted for an estimated US\$ 90 million in value and 850-1150 jobs. 15 new companies were attracted, 1,100 existing jobs were retained and more than 1,900 new jobs through financial assistance to 132 local businesses were created. In 2011 the Portland metropolitan region boasted over 27,000 jobs that produce or add value to goods and services, that result in an environmental benefit. The median wage for these jobs is US\$ 43,000 per year and worth US\$ 14,000 in exports to the economy.

Portland also attracted the solar energy company Vestas and thin film manufacturer SoloPower energy storage leader ReVolt to set up operations in the city. This resulted in 751 new jobs and 300 retained jobs. The city also developed capacity in the wind energy supply chain resulting in sales and services totaling US\$ 2 million for local wind firms.

Portland's experience illustrates the role local governments can play in redefining the economic structure of an urban economy. A long term strategic plan with strong local government policy innovation has ensured the manifestation of a Green Urban Economy in Portland.

(Source: ICLEI 2012)

4.4 A Green Urban Economy agenda

The Green Urban Economy agenda is simultaneously a goal and a journey. Greening the urban economy consists of a bundle of measures, laws, instruments, mechanisms, which reward ecologically and socially sensible action economically and therefore accelerate the transition of the economy towards a sustainable urban economy. Technology innovation, green business models and green business opportunities are principle approaches that can be drawn upon by all actors. The roles of the local and national governments have been singled out as especially important to ensure an effective entry point to action in cities. They can play an important role in setting the right framework and cooperation for:

- a) Supporting the development and promotion of green technologies and innovations.
- b) Providing strategies and tools to explore, identify and apply green business and governance models.
- c) Supporting the identification and permeation of green business opportunities to the market.

Local actors (business, civil society, government) have opportunities to realize and facilitate the opportunities that exist in the transition to a green urban economy. Local governments need to create the desired conditions that firms and businesses require to set up operations in a particular urban area. Local governments can achieve this by passing resolutions, adopting plans, preferential treatment (including financial) for green sectors (Special Economic Zones etc.), and establishing programs or departments to deal specifically with the new green economic trajectory. Local governments can also change their own operations and those of the utilities they provide.

The examples of local governments can provide stimuli to more broader and actor comprehensive action. A long-term objective for local government, would be to subsequently systematically include principal approaches into/across departments of:

- Operations of own municipal operations (buildings, vehicles...)
- Operations of public municipal services (energy, water...)
- Education and awareness raising (sustainable lifestyle, goods...)
- Regulations and governance (e.g. strategic city development plans, design of policies, regulations, instruments incl. investments, financial)

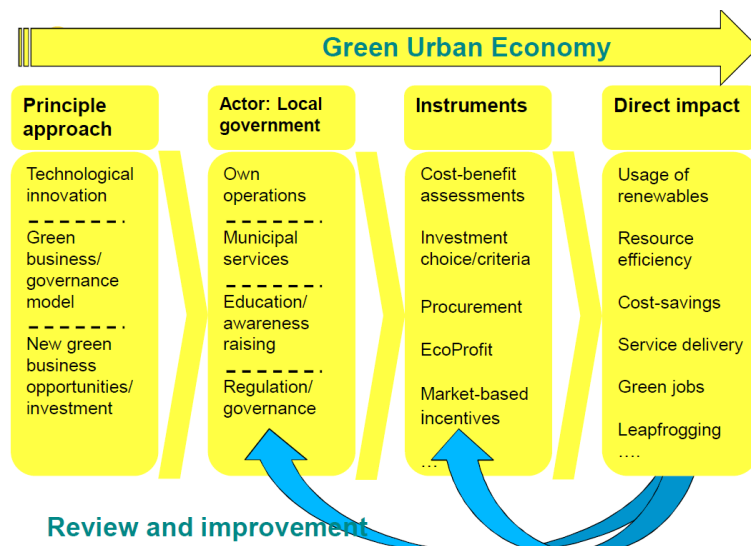


Figure 9 Green Urban Economy as a continuous process illustrated with the local government as actor

Greening the urban economy can benefit from

- applying new economic models (long term cost/benefits) (including direct and indirect benefits to environment and people),
- investments into green, rather than brown activities,
- identifying and using advantages of the urban functional system,
- and building cities that contribute to resource production, rather than just consumption.

By systematically integrating and applying the principal approaches economic activities can be impacted i.e. the way how actors produce, manage and administer resource. In the process it can contribute to create jobs, deliver more utilities, and improve working and living conditions and the state of the environment.

5. Recommended Green *Urban Economy* action

The report has highlighted that already a number of activities in support of a transition from an urban economy to a green urban economy. However, for the local level, knowledge and examples have not been compiled into a structured and accessible whole for application as a toolkit to local governments.

To address this a program should be developed that:

- Focuses on cities;
- Includes aspects of economic opportunities;
- Focuses on value created by going beyond purely economic or environmental aspects;
- Emphasizes holistic, inclusive and equitable development;
- Differentiates between the different socio-economic realities in cities across world regions.

Local governments are often the best placed to lead a Green Urban Economy transition. They are elected, accountable to local people, interact with local businesses and recognized by regional and national policymakers. They have in principle the basic capacity to provide local services, many of which are relevant to local employment and development. They are also responsible for urban planning and city strategies, and act as conveners. They are a highly suited entry point to shape the transition to a Green Urban Economy vis-a-vis national government strategies.

A tool kit should be developed for local governments helping them to work with the business sector and other stakeholders to develop a green urban economy and green jobs by identifying core opportunities and possible policy recommendations. Capacities should be developed for them to explore and implement the three principle approaches:

- a) Supporting the development and promotion of *green technologies* and innovations.
- b) Providing strategies and tools to explore, identify and apply *green business and governance models*.
- c) Supporting the identification and permeation of *green business opportunities* to the market.

Getting the economics right can provide the right tools and guiding framework to distinguish a Green Urban Economy agenda from other agenda, while contributing to important policy strategies, such as low-carbon development and job creation, and acting as a new driver towards sustainable development.

A Green Urban Economy should contribute to green economic development, sustainable procurement, green operations and creation of green jobs. Each can then provide specialist approaches, such as ecobudget, green audits, and ecoprofit that can help cities transition their operations and set them on a greener course without undermining the economic development, in fact rather strengthen economic development.

One objective could be to develop training course that assists cities and local stakeholders in stimulating the green economy and new, green jobs. ICLEI for example already offers and has experience with concrete tools and resources such as: Procura⁺ Campaign; Procura⁺ Exchange; The Procurement Forum; EcoProcura series of conferences®; ecobudget®; etc.

The implications for a program on a Green Urban Economy dictates that the most effective results at the city level will be achieved by addressing and including all actors. At the city level this implies the development of strategic alliances and partnerships, as well as the institutionalization of new processes for these approaches. It may imply changes to old or the creation of entirely new institutional structures, policy and planning instruments, and tools and models. In cases this will require changes to the administrative and legislative framework of local governments by supra-local governance structures. For successful scaling up, lessons learned need to be translated to the national government for policy development and creation of enabling conditions.

The key fields of action need to be adjusted to the respective target group (see table below).

Table 12 Illustration of possible involvement in a Green Urban Economy program with objective

Driver	Objective	Possible involvement
Business	Greening existing economic activities; Realizing green market opportunities with new services and products; Innovating green technologies; Green local job creation; Strengthening the city as business location.	Provide training to company employees on existing approaches (eg green procurement), green business training, etc. Connecting businesses to build a critical mass for local business change. Linking business operations to realize cluster and symbiosis effects.
Civil Society	Lifestyle and behavior change towards purchasing/using green products and services; Understanding and supporting green economic policies; Realizing own opportunities to green activities, household functions etc.	Information provision: knowledge platforms and centers to provide information on green products, services and technologies. Providing enabling framework conditions and incentives to invest in own housing supportive structures for own implementation (potentially with support of local businesses). Providing training for up/re-skilling for labor market. Providing entrepreneur support.
Research	Documenting, creating knowledge on green economic transition in urban areas; Identifying risks and opportunities; Monitoring developments.	Enabling involvement and cooperation. Technical and policy research, and supporting the development of policies and actions.
Local Governments	Setting incentives, enabling framework conditions for greening own and community operations and utilities.	Training to employees on existing approaches (eg green procurement with associated program, networks and tools), green business training, enabling collaboration (eg Ecoprofit). Support in greening operations (fleets, buildings, energy).

There is a high compatibility with lessons learned from and strategies developed for developing local employment opportunities (European Commission 2004)⁵¹. Working with interested cities and technical partners, assessment can be developed to be broken down into a series of actionable items that will enable a city to structure their implementation strategically. Based upon this training modules can be developed to assist with capacity building of local government officials to address the subject of greening urban economies by drawing together the diversity of tools and selection of the most appropriate in a strategic series of considerations.

At the global level, this can be achieved with a global knowledge platform on lessons learned, action opportunities and examples for knowledge documentation and dissemination. This would also increase the visibility of the German development cooperation. Partnerships with key leading international organizations, which have started work in this field, can be explored. A strategic coalition would need to involve a local government actor, inter-national actors on environment and an economic oriented inter-national actor, but also a strategic research institute.

Regionally and nationally it will be important to provide an actual program of implementation such as a pilot program with strategic local partnerships. It would need to enable local community leadership support, provision of training, facilitating of meetings, monitoring of implementation, documentation, development of locally and nationally appropriate policy recommendations. A program methodology could include:

⁵¹ http://www.forumpartnerships.zsi.at/attach/GR_04_R_EC_LocalEmploymentStrategies.pdf

- a) Identification of selection criteria for interested cities with a local needs and opportunities analysis, including a commitment to implement a series of appropriate tools (eg green economy, ecoprofit)
- b) Combining information, tools and examples together for feeding these into global knowledge platform to facilitate dissemination and innovation.
- c) Identifying green businesses or those interested in green transition.
- d) Bringing together actors in workshops to identify options and opportunities for reviewing and developing of business models, plans for technologies and/or market opportunities.
- e) Provision of trainings towards addressing the knowledge gaps, and the options and opportunities for self-implementation (initially from international experts) of technical and business changes.
- f) Setting up local information centers to raise awareness and ensure commitment of all actors and support from local population.
- g) Monitoring progress.
- h) Drawing lessons for national replication and state towards locally enabling and incentives framework conditions.

To effectively facilitate and accelerate the application of these approaches in local governments, urban business enterprises and the local community, different programs can be run at each respective level from global to local. A three tiered approach could subsequently look as follows in the table below.

Table 13 Potential program components with objectives by tier

Actors	Main Objective	Proposed Activities
Global GUE	Knowledge Sharing; Policy Discussion; Agenda Setting	Knowledge generation and dissemination; Local access to global funding advocacy Preparing local actors ...
National GUE	National Policy Development; Investment; Framework	Informed and Applicable Policy Dialogues Nationalization of Local Policy Successes ...
Local GUE	Local Policy Development; Implementation	Awareness raising Skill upgrading Job creation Service delivery ...

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