



Challenges and way forward in the urban sector

Sustainable Development in the 21st century (SD21)



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Executive summary

Urban issues have risen high on many agendas that deal with global questions. Most of the world's resources are consumed in cities, where the majority of people live. It has become obvious that the value of a single "green" building or eco-labeled product is marginal if it is not supported by sustainable urban infrastructure and a culture of sustainability.

In all fairness, cities are at different stages in their development, and many of them in the global South have to struggle with enormous growth rates and immigration. Some urban areas in the North have opposite challenges of negative growth after old industries have died out or left.

Inequity and segregation seem to be common challenges to cities all over the world. Urban inequity and segregation are also an indication of global inequity. While more and more cities want to focus on services and hi-tech, the dirty work of the world remains to be done in the poorest cities with the most meager resources to develop.

Cities compete with each other globally trying to please investors. There is hardly any municipality that does not in its official strategy claim that sustainability is one of its key targets. However, it is a totally different story if one asks into what actions this declaration translates.

Yes, sustainability criteria may be used at the City Hall when envelopes are purchased – but what is the point if every other product and service is the outcome of an unsustainable process? Yes, there is a Dow Sustainability Index – but what use is it if not all companies, investments and financing support sustainability? Yes, there may be a solar panel here and there, but zero emissions mean nothing less than 100% renewable energy. Yes, there may be tree-lined roads but as long as the pedestrian is not the king of the street, the city is not sustainable!

The process towards sustainable cities starts with profound analyses of the past and present culture

of the city. It builds on an inclusive and holistic vision, applies integrated planning and transparent governance, and monitors implementation rigorously. Even a huge amount of excellent but disconnected pieces does not make a well functioning whole. Because money is not going to stop talking, its language will have to become sustainability. A locally rooted, democratized culture of sustainability has to be the foundation of urban development.

Recommendations: Ten steps on the way forward

It would be misleading to categorize conclusions or recommendations according to region or level of development. Cities in the North keep learning from cities in the South – Curitiba and Porto Alegre as prime examples. In most major cities, the developed and the developing world coexist in some form, creating the tensions of segregation and the challenge of inclusion. Inclusion is not a separate issue but an approach that has to be taken when decisions about governance, participation, public transport and urban infrastructure are prepared and made.

One of the most decisive factors that puts cities in different categories is their ability to access financing, be it by collecting taxes and fees for service, getting a share of tax income from their national governments, or by being able to issue municipal bonds or get low-interest loans on international money markets. That is where their attitude to traditional versus high technology or commercial versus non-market solutions becomes significant: are cities able to come up with innovative solutions that do not depend on the most expensive technology and maintenance requirements? The development of the Bus Rapid Transit (BRT) model in Curitiba, instead of a traditional subway system requiring heavy investments, is a prime example.

1. Vision: Inclusive and locally rooted visions of 21st century cities for all

There is no one top-down solution to urban sustainability but a wealth of bottom-up approaches

instead. One of the strengths of cities in both poor and wealthier countries is the initiative and inventiveness of their citizens. Seizing this opportunity requires critical rethinking, application of innovative non-market solutions and the active involvement of all those concerned.

One-way information does not fulfil the contemporary requirement for the quality standards of citizen involvement. People have to be given the possibility to become the key resource of cities. Citizen need a supporting 'infrastructure': places for people to meet and get organized, an attentive media to communicate their concerns, and tools, processes and channels to create initiatives and communicate. Some cities are fortunate to have visionary leaders for one or two electoral periods, while most cities cannot wait for enlightened leadership but have to establish permanent solutions of public participation.

Methods and processes exist already, very similar in developing and developed countries, and are ready to be applied: participatory budgeting, stakeholder forums, popular votes on urban issues, user co-creation of basic services, e-participation, or kiosks for basic services, information and internet access for example. The right to participate is not linked to the home address only, does not concern only geographical communities but also communities of old or young people, pedestrians or bus drivers, street vendors and restaurant owners.

The urban agenda will have to democratize sustainable development further. This can only happen at the local level. After the success of Local Agenda 21, at some point the sustainability agenda has been "hijacked" by civil servants as if it was only a matter of finding the most appropriate technical solutions, and cornered to the cities' environmental departments. The next urban agenda has to be more inclusive, both in terms of participants and issues. Social and budgetary agendas have to be integral parts of it. Economic questions must not be left to economists only but the financial decisions have to fulfill sustainability criteria, too.

Cities all over the world need inclusive pro-poor strategies and guidelines enabling innovative local solutions. If the city is good for its weakest citizen – a child, an aged person, a new immigrant, a handicapped person, it is going to be good for everyone else, too. Integration and inclusion have to be on top of the urban sustainability agenda.

- Sustainable development has to be **democratized** at the local level in every country.
- Existing methods of citizen **participation**, such as participative budgeting, should be used in every city, selecting the locally most appropriate tools and most urgent issues.
- New methods of **inclusion** should be developed and disseminated among cities.

Goals:

2. Towards a culture of sustainability

The cities that come up with interesting pilot projects don't do it by chance. In many cases they have a long history of trial and error behind them – think of Barcelona that has worked consistently since the 1970s. The profile of a city cannot be upheld with individual projects any more but every decision should be weighed on the scale of sustainability.

- Cities should be patient in developing a culture of sustainability and transformation, which is based on a continuous analysis of their local identity and history.

3. Integrated planning of sustainable urban infrastructures

An integrated approach is the only way to avoid decisions being prepared under wrong assumptions: the prevailing preference of an "economic" view has to be replaced by a sustainable one, which includes ecological and social considerations and mid- and long-term thinking. Only if potential impacts of decisions are broadly assessed, will the development of cities become sustainable step by step. To achieve

this, both the administration and political decision making have to work across sectors. Free access to public data is an essential prerequisite for integrated planning, and not just data and access, but the possibility to look for specific information and trends.

In an ideal world urban planning starts at the regional and metropolitan scale and proceeds from larger scale down to neighborhood scale. No development, no construction, in particular no infrastructure investment should be permitted without adherence to approved larger scale plans. For the approval of planning documents, there has to be a transparent process, where the roles of different institutions, stakeholders, experts and decision makers are clearly defined.

- The use of **instruments for integrated urban planning and sustainability impact assessments** (SIA) should be mandatory at national and local levels.

Principles for action:

4. Valuing local skills and non-market based solutions

Many technological innovations and modern solutions tend to be short-lived, difficult to maintain and repair, and costly. Cities and the built environment need solutions that have been adapted to local climate, materials and handicraft skills, maintenance capacities and culture. Heavy infrastructure and the latest technology is not necessarily the best solution.

- National and local standards for buildings and infrastructure should encourage and incentivize the development of **contemporary technological solutions that are based on traditional principles and local skills and materials.**

5. Measuring success and sharing data and knowledge

Everybody in the long chain from research and expertise to political decision-making, implementation

and maintenance needs capacity building in one's own language. Only reliable, comparable facts-based information is useful. Institutions and tools for data collection and platforms to share it need to become stronger.

- National and international research institutes and their networks have to be commissioned to create **databases, benchmarks, a set of core criteria and targets**, as well as to monitor and report about progress to **national platforms of urban information** sharing that should be established in every country.

6. Appropriate mandates and financing at all levels of government

Governance for an urban culture of sustainability is not possible without local power to decide and financing to support it. Cities and metropolitan regions are two among “all levels of government”. Decentralization has to delegate appropriate mandates and secure financial resources to the relevant levels. About issues that cross city borders in an area, networked cities have to recentralize the decision making power to institutions of metropolitan governance.

The local level is the level closest to people, their needs and their knowledge. It is the level of implementation of sustainable development policies in the form of urban infrastructure, basic services and land use and mobility planning. Taxation, cross-subsidies and user fees at local, metropolitan and national level can support sustainable development and curb unsustainable consumption, if they are designed with these goals in mind.

- National governments should engage in a dialogue with local and regional government and agree on **mandates and financing** that are **appropriate** from the point of view of urban sustainability.

7. Cities proactive in a globalized world

Globalization and financialization have direct impacts at the local level. Changes in our urban landscape may be

shaped more by global political and economic decisions than by the seemingly more visible results of local urban planners. Among other things, cities will need a renewed portfolio of municipal “foreign affairs”, because the global level that sets the rules for everyone has until now been unduly inaccessible to local governments. Cities will also have to analyse more carefully, what are the characteristics and roles of the private and the public sector, and what are the conditions for cooperation and partnerships on an equal basis.

Cities join their forces both in order to get their voice heard, but also to disseminate best practices. **City networks** play an important role for **peer learning**, as information and good and bad experiences can be exchanged, and everyone does not have to re-invent the wheel. Joint preparation of projects or procedures is possible and even very small city departments can profit from the organizational, human resources and financial strength of bigger ones. Common action can be taken e.g. to achieve better results in climate protection, reduction of waste, sustainable procurement or new transport strategies, or to push necessary regional, national or international legislation.

- International organizations should take “**ambassadors**” of local governments to the negotiation tables as equal partners with national governments and private sector representatives.
- The global competition of cities, to the extent there needs to be one, should focus on **competing in sustainability**.
- Worldwide networks of cities should be enabled to involve all those cities that have no sustainability strategies, yet, in particular those with biggest estimated growth.

Sectoral measures and actions:

8. Decent urban mobility for everyone

Land use and mobility planning have to be so closely integrated that they become one. Awareness has to increase about the environmental and health impacts of emissions, noise and the space requirement for cars.

Positive impacts of public transport, biking and walking must be brought to the public and decision makers.

- It should be mandatory for all municipalities to offer **public transport, biking lanes and safe pedestrian sidewalks** to their citizens.
- Urban development projects should be charged a transport levy which can finance **restricted parking** facilities and public transport.
- **Road safety** must become the priority for city leaders.

9. Sustainable construction processes, buildings and maintenance

It is important to renew the city with energy-efficient and more flexible buildings of long-term value and longevity. Functional flexibility leads to a longer life for buildings, because they can be adapted to changing needs. Technical systems and services that have a shorter life-cycle than the structure of the building have to be installed so that it is easy to renew them. This means applying technical aids sparingly, maintaining them and making the most of all passive means. Buildings should generate more energy than they consume, and collect and purify their own water.

Many cities have started with retrofitting their own public buildings with enormous success to serve as good examples within the city and outside. Experience in northern European markets indicates that low-income housing stock can be successfully retrofitted for profit, as well.

Monitoring tools are necessary to measure building performance and progress. Criteria are also needed as assessment tools in all procurement, investment and subsidy decisions. Some of the indicators can be used worldwide, but when the rating system is developed within a specific region, it can contain assumptions about appropriate performance benchmarks and the relative importance of issues such as selection of site, water and energy resources, risk of earthquakes or flooding, local climate, solar hours, cultural aspects, availability of materials, and so on.

- All buildings should produce their own **energy**.
- Local and national **governments will have to lead** in setting the benchmarks for new construction, maintenance and renovation of their own buildings.
- **Maintenance and renovation** of existing buildings should become a key business sector, where innovative solutions are incentivized.
- National research institutes should be commissioned to develop local building sustainability **assessment systems** in cooperation with local sector stakeholders. The criteria should cover e.g. environmental impacts, decent work and fair trade requirements, and anti-corruption measures.

10. Energy security and empowerment through distributed renewable energy systems

Using less energy through savings, i.e. decreasing consumption, by increasing energy efficiency with more sustainable procurement, buildings, infrastructure and service provision, and shifting energy production to renewable fuels are self-evident targets that a city has the possibilities to implement. The localized energy revolution requires also new patterns of distributed production and distribution.

Energy can be democratized. “In the new era, businesses, municipalities and homeowners become the producers as well as the consumers of their own energy... We began to envision a world where hundreds of millions of people are ‘empowered’, both literally and figuratively, with far reaching implications for social and political life. ... In the 21st century, individual access to energy also becomes a social and human right. Every human being should have the right and the opportunity to create their own energy locally and share it with others across regional, national and continental intergrids.”

- Energy production should be increasingly **decentralized** and based on **renewable** energy sources.
- National governments should enact legislation that provides fair subsidies to support the shift to renewable energy sources.
- Cities and metropolitan regions should establish energy information offices to give locally appropriate advice to both municipal departments, private companies and citizens.

Contents

Executive summary	iii
Preface	x
From local authorities 1992 to cities 2012	xi
Pace of urbanization worldwide	xii
Africa	xiii
Asia-Pacific	xiii
Europe	xiii
Latin America and the Caribbean	xiii
North America	xiv
Amendments to the urban agenda since 1992	1
From migration and segregation to integration and inclusion	1
From climate change awareness to action in uncertainty	2
From buildings to systemic solutions	3
From recentralization to decentralization and metropolitanization	3
From administration to new public management	6
From globalization to city branding	6
From (neo)liberalization to financialization, privatization and remunicipalisation	7
From commercial to non-market solutions	8
From top-down to bottom-up and e-governance	9
From urban voids to public space and public realm	9
From idolizing the new to valuing heritage and low-tech	10
Challenge of socially inclusive cities	11
Competitive or affordable cities?	11
Vibrancy of the small scale	12
Is ICT going to give a voice to the poor?	13
Towards more sustainable cities	14
The life and death of the functionalist city	14
“Green” and other colors of the visions for the future	15
Green or “Green” cities?	16
Triple zero or energy cities	17
Eco-cities	18
Towards sustainable cities	19
Are we learning from pilot projects and eco-cities?	19
Integrated policies for sustainable cities	20
Sustainable urban infrastructure	20
Transport and urban density	21
Sustainable buildings and construction	23
Energy systems for decentralized “prosumption”	26
Cities as agents of behavioural change	28

Governance for more sustainable cities	30
The power space of cities	30
Sustainable financing for cities	31
Transparent governance	32
Inclusive and participatory governance	33
Learning from Porto Alegre and participative budgeting	34
Governing African urban futures	35
Recommendations: Ten steps on the way forward	37
1. Inclusive and locally rooted visions of 21 st century cities for all	37
2. Integrated planning of sustainable urban infrastructures	38
3. Decent urban mobility for everyone.	39
4. Sustainable construction processes, buildings and maintenance	39
5. Energy security and empowerment through distributed renewable energy systems	39
6. Valuing local skills and non-market based solutions	40
7. Measuring success and sharing data and knowledge	40
8. Appropriate mandates and financing at all levels of government	40
9. Cities proactive in a globalized world	40
10. Towards a culture of sustainability	41
A postscript	42
Endnotes	44

List of Tables

Table 1. Tasks for all levels of government	4
Table 2. Progressing in urban sustainability	16
Table 3. Do cities have the mandate and resources to drive sustainability?	32

List of Figures

Figure 1. Map of a metropolitan region X	5
Figure 2. Global and local pre- and post-globalization	6
Figure 3. Quadrant illustrating changes in the public sphere	7
Figure 4. 3D representation of the spatial distribution of population in 7 metropolis represented at the same scale	22



Preface

The six-lane street cuts across barren land, flanked on both sides by skyscrapers standing in haphazard order, their glass facades reflecting the burning sun. The clumsy towers, which are surrounded by vast fields for parking, house multinational corporate headquarters and pricy apartments for their employees. For leisure, there are several golf courses in the vicinity, artificially irrigated in the water-poor region. Behind the roundabout, where the boulevard ends, a sea of corrugated steel roofs covers the ground, sheltering the families of the petty shopkeepers, waste scavengers, construction workers, drivers and cleaning ladies that keep the city functioning. No pedestrians in sight, neither buses, trams nor a metro. For shopping, there is a shopping mall half an hour's drive away, air conditioned to be freezing cold. – This fictional glimpse of an instant satellite of a megacity could be from anywhere.¹

This report highlights some of the top challenges and priorities for the next 30-50 years in the urban sector. The chapters take stock of urban developments since 1992, and point out certain trends and figures as well as successes and failures. There are inspiring examples but most steps taken by cities are only incremental improvements over the business-as-usual. Progress towards sustainability is slow.

To illustrate the speed of urbanization some figures are presented, and to understand the change in the role of cities since 1992, a number of “amendments to the urban agenda” are described.

Among the many urban sustainability challenges inclusion is seen as the most urgent one to tackle. Like most other sustainability aspects, it cannot be solved separately in a silo, but it keeps reappearing as a cross-cutting issue. The need for integration in urban planning concerns not only inclusion but urban infrastructure, the solid basis on which sustainable cities are built. A chapter discusses mobility, the built environment and energy systems, all of which can have an impact on human behavior, as well. Some key infrastructure and basic services, such as freshwater

and sanitation are left out, not because they would not be crucial, but because they continue to be discussed extensively in other forums.

In contemporary discourse, urban governance does not mean control and dominance. Quite the contrary, it describes the various platforms for dialogue and decision making, as well as processes for implementation. On the one hand, cities fight for autonomy and resources, on the other they turn to their citizen for priorities and support. Some of the bottlenecks are transparency, participation and limitations of cities’ mandates, of their power space. Governance is probably the one aspect of urban sustainability which has the greatest variety of forms in different parts of the world, depending on local political history.

The final chapter draws conclusions from lessons learnt and lists steps that could and should be taken on the way forward.

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From local authorities 1992 to cities 2012

Half the world’s population now lives in urban areas. This is projected to rise to 60 per cent by 2030, with almost all the urban growth occurring in low- and middle-income countries. Regardless of size, cities will become the new home of the biggest share of hundreds of millions of migrants. However, the staggering numbers of urbanization don’t reveal the whole picture. Cities matter for a great number of reasons.

The premise of the Chapter 28 of Agenda 21 (1992) continues to be valid. “Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the

participation and cooperation of local authorities will be a determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.”

Local Agenda 21 became a movement of thousands of cities that made a political commitment to promote sustainability through participatory processes of assessment, priority setting, implementation, reporting and monitoring. Already in 2002, 6,416 local authorities in 113 countries had either made a formal commitment to Local Agenda 21 or were actively undertaking the process.² Even so, there is no single sustainable city in the world, yet, and a lot of work remains to be done. While cities and urban lifestyles are seen as the root cause of many sustainability challenges, there is a common understanding that the solutions can be found in cities only.

Since 1992, the urban agenda and attitudes towards cities have changed. Today, the Chapter 28 would be written in a different tone, acknowledging the proactive role of local governments as independent stakeholders – not merely as local authorities implementing the ordinances of central governments. At the same time, cities have identified challenges that are not new as such, but have not necessarily appeared on urban sustainability agendas earlier. Among these evolving issues are migration, segregation and an urgent need for more inclusion, metropolitanization, financialization and privatization, energy efficiency and renewable energy production, as well as methods of public participation. Urban mobility is now seen as one of the main challenges and as key to both urban density and equity. Buildings and construction have a new task in helping reduce energy consumption.

The role of cities, metropolitan regions and local government organizations has become stronger

vis-à-vis national governments, while at the same time the impacts of the globalization of the economy have become more visible at the local level. All of these challenges pose a heavy burden on models of financing and patterns of urban governance. While cities face more risks they are required to become more resilient. “All politics is local”, the famous quote by Tip O’Neill, an American politician and long-time Speaker of the House, is more valid than ever. “All economy is local” is the later statement of the great urbanist Jane Jacobs.³

Pace of urbanization worldwide^{4, 5, 6}

our future is not only globally intertwined, but increasingly urban. In the next 20 years Africa and Asia will see by far the fastest growth in urban settlements. In Africa alone, the growth in population will equal the current entire population of the USA. Not only the 21 megacities in 2010 with over 10 million, and 33 with 5 – 10 million inhabitants, but the world’s medium sized and smaller towns and cities will be responsible for receiving and looking after millions of new urban dwellers. About half of the urban population continues to live in cities smaller than 0,5 million inhabitants. Moreover, as the world’s urban population grows, the interdependence of town and countryside become even tighter.

During the two centuries until 1950, about 400 million people moved to cities worldwide. Current projections suggest that by 2050 more than 6 billion people, almost 70% of the total world population, will live in urban areas. Cities in developing countries are expected to grow by 1,3 billion people in 2030. The lowest, even negative growth rates are in Eastern Europe.

Urban inequity and segregation are also a token of global inequity. While more and more cities want to focus on services and hi-tech, the dirty work of the world remains to be done in the poorest cities with the most meager resources to protect their citizen. The least developed countries are predicted to have the fastest rate of urbanization, almost 4 percent, in the 2010-2020.

Urbanization will continue throughout the world. But very different types of cities are emerging. In Asia, for example, the current urban population of 38% is predicted to increase to 50% by 2015, with many people concentrated in metropolitan areas. In other regions such as Latin America, where 70% of the population is urban, middle-sized and small cities keep growing. In the northern hemisphere, cities often struggle to maintain an increasingly mobile workforce, and compete for both young, skilled workers and new enterprises as local industries decline. Rapid urbanization is not only concentrated on mega cities such as Lagos or Mexico City. Smaller cities face enormous growth rates.

Megacities are high density metropolises with at least 10 million inhabitants. The number of these megacities climbed from 10 in 1992 to 21 in 2010. Fifteen of the world's 21 megacities are in developing countries. The largest is Tokyo which counts nearly 37 million persons.

While many industrialized countries are concerned about the growing number and proportion of elderly people, the world's youth population, ages 15 to 24, will be concentrated in Africa and Asia. By 2050, the number of youth will have risen from just under a half billion in 1950 to 1.2 billion. At that point, about nine in 10 youths will be in developing countries. This very large group will need sufficient education, decent work and access to basic services.⁷

Africa

Africa, with the most recent urban tradition and experience of city life, is currently urbanising at more than 4% annually. In 1995 only 28 cities on the continent had populations exceeding 1 million, by 2005 this has grown to 43 cities, and it is expected that by 2015 there will be 59 African cities with populations exceeding 1 million. In the region, the urban population of 413 million (40%) in 2010 is expected to rise to 569 million (45%) in 2020.

Asia-Pacific

Half of the planet lives in **Asia**, which is experiencing rapid urbanization, largely thanks to the industrialization of China and India. The world's most populous continent is also culturally and politically diverse, with economic extremes of wealth and poverty. The influence of Asian cities on the world stage is increasingly apparent. Between 2008 and 2025, Shanghai is expected to soar up the global city GDP rankings from 25th place to 9th, and Mumbai is expected to rise in the same period from 29th to 11th place. In the region, the urban population of 1675 million (41%) in 2010 is expected to rise to 2086 million (47%) in 2020.

Europe

In this century, less than one third of **European** cities remained stable in population, while more than one third of cities grew, and more than one third experienced a decline in population. In particular, industrial based cities that are remote from markets and not well serviced by transport are shrinking. Overall, cities in Northern and Southern Europe have been growing faster than cities in the West, and especially Central/Eastern Europe where population loss is very high. In the region, the urban population of 533 million (73%) in 2010 is expected to rise to 552 million (75%) in 2020.

Latin America and the Caribbean

Past century changes have turned **Latin America** into a highly urbanized region at the expense of rural areas. Currently, some 540 million (78%) of Latin Americans are estimated to live in cities, differing between 90% urban population in Southern countries like Argentina to 50% in central American counties like Nicaragua. In 1980, urbanization rates in Latin America were about 65% and rose to almost 75% in 2000. In the region, the urban population of 469 million (80%) in 2010 is expected to rise to 533 million (83%) in 2020.

North America

The total population of the United States grew by 0,9% annually in 2000-2010, and growth in metro areas accounted for over 75 percent of it. Metropolitan expansion was concentrated in the outer suburbs, which grew at three times the rate of high-density inner suburbs and cities. However, not all metro areas experienced growth equally. In the first half of the decade, migration from the northern regions toward the warmer areas of the southern United States and rapid expansion in the suburbs were the dominant trends. However, in several gateway metro areas such as New York City, Los Angeles, and Miami, immigration balanced domestic resident outmigration and ensured that these areas continued to expand.⁸

The United States has the largest number of immigrants in the world at 21% of the world total, but as a percentage of total country population, Canada has a higher number of than the US at 19% compared to 13%. More than 35% of the current populations of Toronto and Vancouver were born outside of Canada. In the region, the urban population of 289 million (82%) in 2010 is expected to rise to 324 million (85%) in 2020.

Amendments to the urban agenda since 1992



The urban agenda is growing much longer, assuming that the role of cities is changing. In many parts of the world the role was limited to implementing policies set at the national level, and to taking care of the most basic services like providing access to water, primary education and primary health care. Even energy has often been provided by a monopoly company under the Ministry of Energy, with cities having little to say. In many countries, the income base of cities continues to be weak, based on real estate tax and service fees only. One could have assumed that globalization strengthens the already stronger higher levels of government, but paradoxically, globalization has put more cities on the map in a bigger role than earlier, and challenges them in many ways. This chapter discusses some of these factors that have an impact on urban sustainability.

From migration and segregation to integration and inclusion

Migration is certainly not a new phenomenon, but its sheer numbers, links to urbanization and governments' attitudes are different than in the past. The pre-World War I pro-migration consensus changed towards the end of the 19th century, when many countries introduced entry restrictions. However, even if trade in goods and movement of capital have been rapidly liberalized in recent decades, there has been no comparable liberalization in migration, quite the contrary. UNDP's report suggests that the policy response to migration can be inadequate. Many governments institute increasingly repressive entry regimes, turn a blind eye to health and safety violations

by employers, or fail to take a lead in educating the public on the benefits of immigration.

Every year, more than 5 million people cross international borders to go and live in a developed country. There are 214 million international migrants in the world today. Among people who have moved across national borders, just over a third moved from a developing to a developed country – fewer than 70 million people. Most of the world's 200 million international migrants moved from one developing country to another or between developed countries.⁹

International migration is increasing, although it slowed slightly in 2009 due to the global recession. In the future, international migrants will become an increasingly essential part of populations also in European and Mediterranean cities.¹⁰ Canada and the US continue to be shaped by immigration. To keep up with the number of migrants arriving in Indian cities, the country will need to build a city the size of Chicago every year. Chinese cities expect millions of rural migrants a year in the coming decades.

Most migrants do not go abroad at all, but instead move within their own country. UNDP estimated in 2009 that there are about 740 million internal migrants in the world, almost four times as many as those who have moved internationally. Asia and Africa are facing a continuation of the rapid urbanization seen over the past 20 years, and rural-urban migration persists.

Migration becomes a sustainability challenge if the large demand for new housing and basic services cannot be met, and cities face a rapid growth of segregated informal settlements. We have seen how growing inequity and segregation have occasionally led to violence, in both industrialized and poorer countries, in cities with large income differences. Detroit has become a contemporary symbol of shrinking cities. In the 1950s, the former Motor City had 1.85 million inhabitants. By 2010 the number had decreased to 0.7 million, and the metropolitan area is plagued by unemployment, racial segregation and violent crime.¹¹

The UNDP notes that it is vital to ensure that individual migrants settle in well on arrival, but it is also vital that the communities they join should not feel unfairly burdened by the additional demands they place on key services. Where this poses challenges to cities, additional fiscal transfers may be needed. Ensuring that migrant children have equal access to education and support to catch up and integrate, can improve their prospects and avoid a future underclass. Language training for all family members is key.¹²

From climate change awareness to action in uncertainty

Increased awareness of the risks of **climate change** to cities has led to a detailed analysis of the urban sources of greenhouse gas emissions and search for tools to reduce them. It is often assumed that saving energy is primarily a technological challenge. It is, however, highly dependent on human behaviour which can be influenced by solutions regarding infrastructure and services – safe routes for non-motorized transport and comfortable and reliable public transport as prime examples. Cities have been at the forefront of recognizing the extent of the climate challenge, and some have set themselves ambitious targets for reducing GHG emissions. There is a great variety of projects to promote energy savings and energy efficiency as well as to increase the share of renewable energy and local energy production.

It is common to expect that climate change adaptation planning and action should be based on scientific evidence. Science, however, cannot provide absolute certainty about future. Simply postponing action until there is perfect evidence will increase the risks facing urban centres, their populations, industries, and those who depend on them. Adaptation planning therefore requires managing also the uncertainty inherent in future projections. Cities at the forefront of climate change adaptation have shown ways that scientific evidence can be used to support this process, but have also developed innovative means for dealing with uncertainty.

Durban, South Africa, for example, has developed models of local impacts resulting from sea level rise, changing temperature and rainfall. In Toronto, Canada, predictions of dangerously high summer temperatures have encouraged the expansion of cooling centres and the development of programs targeting building retrofits that conserve heat in the winter and disperse heat in the summer. Quito, Ecuador, has created an inter-institutional committee for responding to climate change that brings together a range of city officials, academic partners and citizens to identify the most appropriate responses.¹³

A quantum leap to renewable energy would also mean increased security. In the words of J. Rifkin, “The shift from elite fossil fuels and uranium based energies to distributed renewable energies, takes the world out of the “Geopolitics” that characterized the 20th century, and into the ‘Biosphere politics’ of the 21st century. Much of the geopolitical struggles of the last century centered on gaining military and political access to coal, oil, natural gas, and uranium deposits. Wars were fought and countless lives lost, as nations vied with each other in the pursuit of fossil fuels and uranium security.”¹⁴

From buildings to systemic solutions

Worldwide, roughly 40 per cent of all energy produced is consumed in buildings, which translates to about 30 per cent of all carbon dioxide emissions. The 4th assessment report (2007) of the Intergovernmental Panel on Climate Change (IPCC) compared the emission reduction potential of various sectors with the costs of implementing the measures. The comparison made it clear that buildings are “low-hanging fruits”, where the huge emission-savings potential is the cheapest to implement. The key fact is that, while the high level of emissions from the production of construction materials and the resulting embodied energy must not be underestimated, the focus has to be on the operational phase of buildings. This information has understandably reoriented and somewhat limited the discussion about sustainable buildings to energy issues.

The mix of concepts used about buildings and construction processes has been confusing: instead of “green buildings” it would have been more truthful to talk about “a building with some features to reduce the energy needed to use it”. Worldwide, there are extremely few “sustainable buildings”, which would fulfill the goals of a life-cycle approach, concerning operation, maintenance and reuse in particular, and social and societal factors such as workplace safety, corruption and accessibility.

Even if a building would be built out of individual parts that all have ‘green’ certificates, it is no guarantee for its sustainability. And if the most sustainable building would be located far away from public infrastructure and services, requiring long daily commutes, it would not be a truly sustainable building. There is a growing consensus among experts about the need for systemic analysis and performance-based and time-bound sustainability criteria, which go far beyond the walls of a single building. Buildings are sustainable only as elements of sustainable cities and infrastructure.

From recentralization to decentralization and metropolitanization

One of the reasons why cities matter for sustainability is the fact that they turn abstract visions and targets into stone and mortar, translate policies into streets, housing and day-care centres. This calls for decentralization in particular from the national to the metropolitan and local levels, and financing mechanisms to support it.

Cities’ global umbrella organization United Cities and Local Governments (UCLG) argues for decentralization for two reasons. The first is that local governments are closer to the people than the central governments, and they have superior access to local information that allows them to better respond to the needs of citizens. The second is that they face stronger incentives to perform well on local matters than the central government, so that they are in a better position to derive the most from public resources at

their disposal and are more likely to seek innovative means of doing so.¹⁵

The huge variety in modes of decentralized governance and roles assumed by cities versus other levels of government reflects the history of each country. In some countries villages and local communities have traditionally taken care of common issues and have internalized bottom-up subsidiarity principles, the Nordic countries as an example. Subsidiarity is a more top-down discovery in highly centralized countries, France as an example.

One of the counter-arguments to decentralization has been that the local level is corrupt and thus incapable of taking care of public affairs. This is definitely a serious issue, and will be further discussed under *Transparent governance*. It is, however, also fair to ask whether corruption is more frequent in municipalities than at higher levels of government. One could also argue that decisions at the local level are more easily accessible

to public scrutiny than at the national level. Another argument against decentralization is lack of capacity, which can certainly slow down the delegation of powers until sufficient capacity has been built.

The UCLG further notes that the global economic and financial crisis that emerged in 2008 has imposed major constraints on local governments. At the same time, central authorities in some countries have responded to the crisis by taking recentralization measures to deal with their own fiscal problems and by increasing control over local governments.¹⁶ Also in countries with strong local government with multiple responsibilities, there comes a moment when the local level is overstretched in its capacity to cater for new services, if it does not receive the matching financial resources from somewhere.

Nevertheless, decentralization has grown in popularity over the past couple of decades, and weaknesses and strengths of the system have been identified. For

Table 1. Tasks for all levels of government

	LAND USE	BUILDINGS / REGULATION	PUBLIC BUILDINGS; leading by example	ENERGY / INFRASTRUCTURE	ENERGY / PRODUCTION; leading by example	MOBILITY / INFRASTRUCTURE	MOBILITY / PUBLIC TRANSPORT	FINANCING
National government	National land use priorities	National land use & building act, guidelines, specifications	Parliament building, ministries, universities hospitals, ...	National and supra-national grid	National policies, taxation	National & supra-national networks, possibly airports, railroads	Possibly nationally owned railways and airlines	Income & business tax, VAT, etc. Sovereign bonds & loans from markets
Metropolitan / regional government	Regional plan, land use principles, e.g. densities		Educational facilities, regional utilities, hospitals, ...	Fixed areas for wind farms	Large scale energy production; areas for biomass production	Tram, BRT and metro lines, pedestrian and cycle routes, roads	Regional public transport, pricing	Subsidies from national government, Share of local income tax, fees for service
Local government, cities	Zoning & detail plan, real estate policies for city-owned land,	Local building ordinance, building control	City Hall, schools, fire stations, daycare centres, ...		Local, publicly owned energy production	Tram, BRT & metro lines, walkways, cycle routes, roads, parking	Municipal public transport, pricing	Local income & real estate tax; fees, possibly municipal bonds & loans
Citizen, other stake-holders	Participatory urban planning	Petitions for building preservation and right to comment permits	User feedback, right to comment project proposals	(Local, neighborhood scale infra for renewable energy)	Local, cooperative renewable energy production	(Private roads)	User feedback	Taxpayers, participatory budgeting

Source: Author's elaboration.

example in Latin America, 15,800 local authorities are now elected, compared with only 3,000 in 1973¹⁷.

Urbanisation is not only city-based but also region-based, and sustainability challenges don't respect any borders. This is why larger metropolitan regions and networked urban structures, poly-centric city regions, are becoming operational frameworks for development. In most **metropolitan regions**, one city is not regarded the only centre any more but several sub-centres together create a networked urban structure, with sub-centres assuming different roles. The central city may have a minor share in population and tax income but offers essential services and jobs for the whole city region.

Metropolitanization does not make urban governance any easier, quite the contrary, but it seems to be the only way to deal with issues such as water, energy, transport, segregation and housing. Metropolitan regions require democratic governance and financing of their own, designed to deal with the issues which are best dealt with at the metropolitan scale. Metropolitan regions are not solely urban but have also rural areas within them, securing space for agriculture and local renewable energy production. Metropolitan strategies are not limited to urban development issues only, neither do they look at rural areas solely as nature reserves or as reserve land for urban development, but try to grasp more complex aspects of the urban-rural interdependence.

Figure 1. Map of a metropolitan region X



From administration to new public management

New public management (NPM) emerged in the late 1970s as a governance paradigm, where the market was seen as the supreme model for organizations. The earlier doctrines of public administration had focused on the ethics and rationality of public servants, and on the concept of public good. NPM redefined the nature, tasks, goals and methods of public administration as “production of services” and its success criteria became the same as those of private enterprises. Privatization, outsourcing as well as the creation of artificial “internal markets” could be used as strategies.

NPM is based on the idea that public sector organizations can and should be managed just as if they were private companies. This has also meant the introduction of the vocabulary and values of the private sector, such as ‘customer’ instead of citizen or ‘efficiency’ instead of impact. ‘Governance’ replaced ‘administration’. In the name of efficiency, compulsory competitive tendering (CCT) was introduced. The fundamental differences between public and private organizations have seldom been analyzed, neither their consequences for urban governance.

The drivers of NPM were either financial distress, lack of productivity, opacity or a general dissatisfaction with what is often referred to as ‘red tape’ or ‘stiff bureaucracy’ in delivering public services. In NPM, competition is seen as key to efficiency gains. One of the main goals is the reduction of the public sector, which can be achieved through contracting out and Public-Private Partnerships (PPPs), which were promoted worldwide by institutions like the World Bank (WB) and the Organization for Economic Co-operation and Development (OECD).

As the language introduced by NPM suggests, the city is increasingly cast in the role as an ‘enabler’ and decreasingly in the role as the supplier or regulator of public goods, such as land and housing, services and infrastructure. Indeed, one of the basic characteristics

of the neo-liberal state is to separate policy-making from implementation, and to isolate the production and provision of urban public services from public control.

This has profound consequences for the targets of urban sustainability, as it distances political decision making from the substance of urban development. As will be discussed also in the following chapters, while NPM introduced competitive tendering, also the idea of a competition between cities emerged. However, the criteria underlying this competition are geared primarily towards enabling the success of corporations.

From globalization to city branding

Figure 2. Global and local pre- and post-globalization



Source: Author's elaboration.

The new role of **cities** as creators of enabling environments for private business to operate – a role that used to belong to nation states alone – has prompted cities to become active also at the global level.

Most cities see securing their economic and financial viability as their primary task. Sustainability is not regarded as an equally omnipresent and cross-cutting issue. With the globalization of economy and opening of financial markets, cities compete for international investments and financing. The goal of their strategies is to become the host city for regional offices of multinational companies or headquarters of worldwide organizations, or even of short term events with global media visibility.

This has led to various different methods for raising the city's profile and increasing its efficiency. Paradoxically, urban strategies are filled with similar fashionable programmes everywhere: Smart cities, innovative cities, creative cities, green cities, liveable cities, design capitals, capitals of culture, global cities... As major investment projects, prestige infrastructure is prioritized: cultural institutions as showpieces, fast trains to airports or Formula 1 tracks. Only a few cities want to profile themselves as sustainable or resilient cities, or cities fighting segregation or climate change, and see that these goals will help them to gain a more competitive position. Rotterdam¹⁸ is an example with its Sustainability Programme: "A clean, green and healthy city where sustainability contributes to a strong economy".

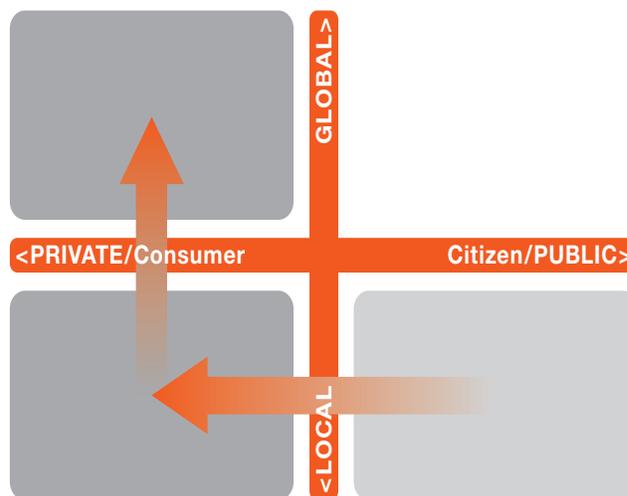
All kinds of **city ratings and awards** have been introduced: the most livable but also the most polluted city of the world as examples. Most rankings are based on corporate-friendly criteria – even if some cities have understood that what is good for their own citizen is good for everyone else, also for the global capital. However, good intentions and strategies alone don't make change happen: data, benchmarks, measurable targets, timetables, political decisions, strategies, visions and reporting systems are needed.

From (neo)liberalization to financialization, privatization and remunicipalisation

Liberalization of world trade and financial markets as well as financialization have had direct impacts on cities. Financialization refers to the increased importance of financial versus real capital in determining the rhythm and returns expected from investments, and the increased subordination of that investment to the demands of global financial markets¹⁹. If a factory is closed down in one city and opened up in another one, the move is punished or rewarded by the financial markets.

Availability of investment capital as well as loan conditions set by international financing institutions (IFIs) have helped multinational companies turn into

Figure 3. Quadrant illustrating changes in the public sphere



Source: Author's elaboration.

providers of local public services. One track of this development is called the public-private partnership (PPP). The trend is reinforced by the financialization of shareholder markets. Cities lacking direct access to investment finance have increasingly looked for PPPs in the management of municipal utilities and provision of basic services. Freshwater and sanitation, waste management, energy production and distribution, public transport, also health care is being provided by multinational companies. The contractual arrangements vary from outsourcing to privatization, which radically downsize the scope of public decision-making concerning urban infrastructure or the provision of services. The question can be posed as to whether the privatization of public service delivery creates a democracy deficit in the cases where decision making processes are taken from the hands of local stakeholders and City Councils to global boardrooms of multinational companies and the possible deficits are contracted to be borne by public subsidies and guarantees. To de-politicize the decision making, a frequently used argument for privatization is 'efficiency, not ideology'.²⁰

Since the 1980s economic globalization has led to an incremental, continuous privatization of public assets and services, not only at the national but also at the local level all over the world. It seems that this privatization

process follows a pattern, which has certain similarities everywhere, regardless of what is being privatized. As an outcome, the urban public sphere is disintegrating while it is being emptied of its public elements.²¹

Public-Private Partnerships (PPPs) were introduced at a larger scale since the 1990s. Undoubtedly, there have been deficiencies also in public management, which can learn from private sector best practices. However, the unconditional comparison between the public and the private sectors has missed some basic differences in their characters, which can make them unequal partners. After two decades of learning by doing, many cities are now in a better position to judge which solutions are more sustainable. Paris is an example of a city that has taken the control of water services back to its own hands in 2010. “We want to offer a better service, at a better price,” the Mayor said.²²

Not only countries but many cities have been hard hit by the recent financial crisis, not least because of its impacts on **real estate** and their value as investment and collateral. Another local impact is the way how international real estate investments drive urban development. Buildings are measured in billions, not square meters. ‘Investor appetite’ dictates what is worth building and where: good office space and shopping centres in prime locations with easy access, in key cities in select countries with growing economies and guaranteed rental income. As Saskia Sassen²³ has described, speculative urban property markets have become prime engines of capital accumulation.

From the investors’ perspective, the built environment has worth thanks to its rental income and resale value. Big investors prefer commercial and office space to housing, and big developments to individual buildings. In an extreme case, investors can consider the value of land negative, because managing it or rezoning it is regarded as costly.²⁴

From commercial to non-market solutions

Non-market valuation places a monetary value on goods that are not traded in regular marketplaces.

These include environmental quality, health risks, artistic and cultural heritage, and natural resources that are visited and used for recreational purposes.²⁵ Ecosystem services can provide some of the non-market solutions.

The Millennium Ecosystem Assessment (MEA) published in 2005 showed that quality of human life depends on the health of the ecosystem. From cities’ point of view, key ecosystem services include regulating services such as water regulation, water purification and waste treatment, erosion regulation, climate regulation and natural hazard regulation. It is well known that many of the recent devastating floods have occurred because the natural watershed flows have been hindered by reckless construction.

A famous example of water purification provided as an ecosystem service is the City of New York. The city funds and implements a comprehensive Long-Term Watershed Protection Program which maintains and protects the high quality source of drinking water for nine million water consumers representing nearly half the state’s total population.²⁶ Instead of building a water purification plant, the city has purchased land upstate in the watershed area, and made agreements with land owners regarding land use against payment, in order to secure that the water is not polluted by industries or agriculture. The facilities required to filter this water would have cost about USD 8 billion to build, and between USD 300-400 million annually to operate. Instead, USD 200 million a year is spent on preserving ecosystems and managing land use in ways that help keep the water supply clean naturally.²⁷ At the same time, New Yorkers have been provided with a riverfront area for recreation.

The shift of emphasis from commercial and high-tech solutions to those that are fundamentally outside of market logic and often based on traditional technologies can be illustrated by an example from the construction sector. Some building certification systems indirectly require the use of heavy, energy consuming air conditioning systems, while they do not acknowledge the performance of low-tech

solutions based on traditional, more energy efficient technologies requiring less maintenance. However, there is a noticeable trend to use local materials and mechanical systems in buildings that are not purpose-built for the real estate investment market.

Also, an increased awareness about the rebound effect supports the trend to avoid hi-tech solutions, which would in fact increase consumption, soon become obsolete and need to be replaced at frequent intervals by the momentarily latest technology.

In the information and communication technology (ICT) sector Wikipedia and Linux have been examples of non-commercial products, which are co-developed by users and where the contents and products can be shared by everyone for free. The most convincing model for an energy revolution, which will be discussed later, is based on an adaptation of similar cooperative thinking: every citizen can become a “prosumer”, producer and consumer of renewable energy into an intelligent grid.

From top-down to bottom-up and e-governance

“It is difficult to work for local government, the people are never satisfied...” This statement of a devoted civil servant is certainly true, but it proves that the voices of citizen are being heard. The recommendation to promote **public participation** in various local government decision making processes has been included in the legislation of several countries. There is a common understanding that individuals and civil society organizations are necessary as watchdogs to question the accountability of public and private decision makers and as voices to express citizens’ concerns and priorities. However, the concept often remains an empty slogan for both most citizens and politicians. Independent, bottom-up public activism is often dealt with more as a disturbance than public participation.

The emergence of the new information and communication technologies has an enormous impact on urban life. The widespread mobile phone and internet communication are just the spearhead of more

exciting technological innovations which are apparently lying ahead. While we are witnessing this information revolution, a more substantial analysis of the changes implied is not available, yet. Among the questions are, for example, what has changed with regard to the communication about the city and its political and societal understanding? How has the appearance of social media changed the way of planning and political perspectives on the city? What are the emerging opportunities deriving from the information revolution for addressing the most important urban problems?²⁸

At the regional level, the European Commission arranges web consultations, where every citizen of the European Union has the possibility to comment a policy proposal of the Commission on the internet. The questionnaire includes a considerable amount of information about the issue at the same time. For the sake of transparency, an organization has to register, but a private individual only leaves her or his name but can comment anonymously.²⁹

However, even where forums for active participation exist, in urban planning issues for example, the participants tend to be the most active people from their communities, not the marginalized ones most in need to get heard. Another concern is the digital divide which prevents many groups of citizen the access to e-participation.

Also the private sector has understood that it is more efficient to develop new products and services together with the future users instead of only by engineers in closed laboratories. In the public sector, this ‘user-centricity’ or ‘co-creation’ are other names and approaches to public participation, which can mean workshops, user panels and questionnaires about the quality of basic services.

From urban voids to public space and public realm

Instead of looking only at the built elements of the urban environment, more weight is now given to the space in-between, the **urban public space**

with a multiplicity of functional purposes and symbolic meanings.

Is the contemporary role and character of the urban public space primarily a marketplace and space for logistics or does it continue to be the home base of civil society and democracy? If, according to a popular notion, urban public space is 'the living room' of the citizens, are people understood as citizens or as shareholders, as consumers or as representatives of civil society? Who else has the keys to this common living room?

The concept of 'public space' is easy to grasp primarily as three-dimensional physical space. Instead, the terms 'public sphere' and 'public realm' emphasize the more societal and political dimensions of public space. As David Harvey has noted, "While it may well prove impossible to sort out the relationship between the physicality of urban public space and the politics of the public sphere with any exactitude, there are, I think, some potent points of linkage between them. We do not, after all, experience the city blankly."³⁰

Green areas and parks are important to city dwellers not only by adding to biodiversity and as tokens of nature in the city, but also providing anyone a place for a moment of rest. Cities like Rio in Brazil and Sendai in Japan take pride on the trees that have been planted on sidewalks, giving shade to the pedestrians and adjacent buildings. Batangas City in the Philippines promotes roadside gardening and subsistence community gardens. The popularity of urban agriculture is increasing all over the world. Beyond user values, urban public space helps create a sense of community, and its quality reflects the degree of respect towards any single citizen.

From Bogota to New York, cities give more space to pedestrians and chase cars away from central squares and sidewalks. Legislation in India secures rights to street vendors. The "Arab Spring" and "Occupy Wall Street", two completely different processes, are recent examples of the significance of the urban public sphere. Citizen movements may be spurred and

supported by the new social media, the Twitters and Facebooks, but after all, people gather at streets and squares to make their voice heard. Curfews witness of the same.

From idolizing the new to valuing heritage and low-tech

The great hopes of the early industrial age created a spirit where everything new was regarded better than anything old. The mass produced private automobile and the public infrastructure that was built to support it led to a disintegration of the city. According to the principles of Functionalism, areas for housing, work and leisure could be separated from each other and reconnected by traffic. Mass production also completely changed the way most buildings have been constructed since the mid-20th century. We are now learning the hard way that a lot of valuable indigenous technologies, local knowledge and built **heritage** has been discarded and lost forever. This concerns as well crafts, production patterns, systemic solutions, single buildings, neighbourhoods as entire cities. Not only natural but also built environments need protection.

Recently, however, many top experts have found ways to interpret traditional knowledge and local materials, and produce built environments that respond to contemporary needs at the same time as they use old technologies for air conditioning, for example. The principles of old solutions which are based on centuries of experience in a certain climate and basic laws of gravity, temperature or humidity, are by default sustainable. This is one aspect of the growing interest in non-market solutions that was discussed earlier.

If nothing else, the increasing role of tourism as an export industry has made cities aware of both the monetary, social and cultural value of old neighbourhoods. The challenge is how to keep the buildings and neighbourhoods alive and avoid gentrification that only preserves a shell.

Challenge of socially inclusive cities



Socially inclusive cities are places where equity is translated into three-dimensional physical reality. Urban infrastructure can have fundamental equity impacts, public transport solutions and design of public spaces that are open for street vendors as examples. If not inclusive, local measures can be powerful tools to reinforce exclusion, through creation of gated communities or prioritization of the private car in transport planning, for example.

Competitive or affordable cities?

The dominant “vision” of urban development has been one of competitive cities being led by an economic development model whose engine is built on attracting investment from investors across the

globe into manufacture, trade, services for export on the one hand, and on the business opportunities for infrastructure and real estate development, services and consumer goods for the growing middle class on the other. This vision has been neither “inclusive”, nor a vision of environmentally sustainable development. However, the imperatives of inclusive growth and of combating climate change are acknowledged and are gradually gaining importance in governmental policy.³¹

While the Millennium Development Goals have been advanced in terms of reducing the percentage of the urban population living in slums worldwide, the absolute numbers continue to grow. Between 1990 and 2010, the proportion of urban dwellers living in slums decreased from 46% to 33%, but the total

urban slum population in developing regions grew by 26%, from 656 million in 1990 to 827 million in 2010.³²

Worldwide, almost 1 billion people live in so-called informal cities, and it has been estimated that this number will increase by at least another half billion over the next 15 years. Thinking about the future of cities means facing the challenge of those figures and the related problems of inequality, education, health, crime, governance, exclusion, and loneliness. The real challenge lies not in upgrading the favelas and slums with infrastructure such as sewage, water, and electricity, but also in finding sustainable solutions to integrate these settlements into the “formal” urban structure and economy. It should not be forgotten that some of the “informal settlements” of today are how great European cities used to be in medieval times.

The assumption that large cities will need large technology upgrades and investments in infrastructure applies principally to those aspects of city that are dependent on “global” integration – airports, mass rapid transport between commercial hubs with their huge demand for electricity. However for the most part, even in large cities, there can be alternative forms of dignified and healthy urban living – compact with low carbon footprints – that are affordable and do not need huge financial infusions “from the future”. This is a middle ground between “organic” laissez-faire form of growth and the fashionable high tech “the future today” vision.

The concept of the affordable city in the context of developing countries should be of an urban system that does not depend on high capital intensive infrastructure becoming a pre-requisite for “development”. The infrastructure should also not become locked into systems that are dependent on maintaining complex and secure integration with high per capita energy requirements.

There is the risk that cities with ethnically diverse populations, where existing city structures represent and reinforce a history of ethnic resentment, become volatile environments. Hence, it is in the interest

of cities to look for strategies of inclusion, such as involving the migrants or other marginalized groups in the processes of inclusion and integration from the beginning, and securing easy access to basic services including education, health care and transport.

Vibrancy of the small scale

The great potential of “informal settlements” and their organizational structures are now being acknowledged and poor citizens and poverty are seen as an innovative resource, as was pointed out already in the 1980s by the Peruvian economist Hernando de Soto³³. In development cooperation discourse, the goal is not just the eradication of poverty any more, but reduction of inequality. Experience has shown that the trickle-down theory does not work. Poverty is not primarily rural any more, but increasingly urban. Robert McNamara³⁴, outlining new strategies for the World Bank in 1973, noted that the bulk of the poor are in the rural areas. That is why the focus was on agriculture. “It has often been suggested that the productivity of small-scale holdings is inherently low. But that is simply not true. Not only do we have the overwhelming evidence of Japan to disprove that proposition, but a number recent studies on developing countries also demonstrate that, given the proper conditions, small farms can be as productive as large farms.”

The shift from preference of the large scale to seeing the vibrancy of the small scale could maybe be transferred from rural to urban conditions. Most of the points McNamara suggested for a program to support small subsistence farms in 1973 could be valid for poor urban areas: “1) Acceleration in the rate of land and tenancy reform. 2) Better access to credit. 3) Assured availability of water. 4) Expanded extension facilities backed by intensified agricultural research. 5) Greater access to public services. 6) And most critical of all: new forms of (rural) *urban* institutions and organizations give as much attention to promoting the inherent potential and productivity of the poor as is generally given to protecting the power of the privileged.”

The poor cities are cash poor, but they have a wealth of human and other resources, and successful strategies would find ways of unlocking this wealth. Examples could be the allocation of Community Credits for civic duties; setting up local bartering systems; or encouraging recycling with public transport tokens as was done in Curitiba.

Municipal services do not need to be provided by bulk infrastructure. Instead, decentralized solutions could allow various alternatives. Assistance early on with the layout of informal settlements can allow for the gradual development of a well-structured urban environment. Urban land policy has an important role. It can give locational advantage for affordable homes in relation to the social amenities and transportation infrastructure of the city, as well as proximity to opportunities of employment in the city. The processes of urbanization can become the engine for distribution of wealth and knowledge to meet the challenge of inclusiveness.

Is ICT going to give a voice to the poor?

The information and communication technology (ICT) is often heralded as an instrument that is going to provide equal access to information and give a voice to the poor. However, as UNDP Administrator Helen Clark has said, ICT alone will not automatically reduce disparities or improve living conditions for all – but it does create important platforms to improve human development. “By linking remote health clinics with specialist diagnostic centers, we have seen improvements in maternal and child health outcomes.

By linking students in rural areas with teachers and the wealth of knowledge available in cyberspace, we have witnessed transformation in the education sector. And by enabling people to interface with public institutions and services – all of these things can be catalysts for human development. ICT plays a catalytic role in advancing human development by improving access to information and service delivery, and enabling broader democratic participation. It can transform the way governments and development actors work, to ensure that our policies and programmes are more responsive to the needs and priorities of the poor and marginalized.”

For example, over 4,000 e-services centers are being deployed around Bangladesh to bring public and private services closer to local communities through “Digital Bangladesh”, a national agenda to use ICTs to help meet goals in education, health, employment, and poverty reduction.

However, like most technologies, the ICT is not only a blessing. It is also a “Big Brother” constantly following our movements in public spaces. In recent years, many cities have invested more in videosurveillance systems, most of them for the benefit of the private sector, than on ICT for e-participation, smart grids, elderly care or other technologies that would enhance sustainability and democracy.

Towards more sustainable cities



Worldwide, cities are at different stages in their development. Some became industrial cities already over a century ago, others are only now industrializing or in their initial phase of becoming more service oriented. Right now, many cities are cleaning up the traces of pollution caused by obsolete industrial production processes and opening up former industrial and harbor areas for housing and workplace development. Others are not at this stage of urban infill or redeveloping brownfield sites, yet, but grow from within, sprawling at their edges, or on greenfield sites.

The life and death of the functionalist city

The ideology of functionalism was brought to architecture as well as urban planning as a reflection

of the great wave of industrialization. The principles were developed in the 1920s and 1930s by a group of European historians and architects, of whom the most influential has been Le Corbusier with his writings and plans, among them *The Contemporary City* and *The Radiant City*. The plans meant a total paradigm shift as compared to the earlier practices of city building. They were fuelled by a social conscience, with the aim of providing healthy living environments with sunlight and large green areas for people who had lived in overcrowded dark backyard apartments in densely built urban areas. The ideas of social reform were supported by the new technology which made possible an industrial production of high-rise housing blocks. The mass-produced automobile would solve the problems of circulation, because the zones for housing, for work

and for leisure would be separated from each other. After all, work also meant industrial production, which continued to pollute the area in its vicinity, and had to be buffered from the housing areas.

The ideas of The Functional City were formulated in a document known as the *Athens Charter* (1943) which was going to dominate urban development in particular in the decades after World War II, and to a great degree until today. Despite its great ideas of greening and social welfare, the concept of separate zones has disintegrated cities. Our task today is to put the pieces together, again. Because Functionalism believed in scientific data and heralded *the new*, everything old had to be erased to give way to the utopia. The new cities Brasilia and Chandigarh were experiments where these ideas were implemented as fully as possible.

The mass produced, high rise housing block outside of the city center seemed, of course, a perfect solution for the cities that had to deal with post World War II destruction and urbanization. The automotive industry found millions of clients in the new inhabitants of both high-rise and low-rise suburbs.

Jane Jacobs' book *The Death and Life of Great American Cities* (1961) was a wake-up call to save cities and urban life. She criticized the "rationalism" of modernist urban planning that had rejected the city with its complexities, mixed uses, urban density and human scale. Functionalist "urban renewal" had meant that old neighbourhoods were torn down, and the separation of uses had meant that the city centres were dead after people had left the offices and driven home to suburbs.

Jane Jacobs has been extremely influential even if somewhat misused when she is referred to as an influence to the emergence of "New Urbanism", post-modern look-alike versions of nostalgic Main Streets and low-rise housing. The model has been adopted by real estate developers for small-scale suburbs but does not contribute to the solution of real urban challenges that have been discussed here.

Towards the end of the 20th century it had become obvious that very similar social problems that initiated the Functionalist paradigm shift now have to be solved in the mass produced, single-function housing areas: segregation, changes in industrial production processes, unsustainable use of resources, negative impacts on human health and 'lack of sunlight'. Urban planning has slowly returned to the city but urban policies lag behind while they have to deal with the challenges that have been discussed above.

"Green" and other colors of the visions for the future

Since the 1990s the introduction of sustainable practices into urban development seems to have progressed stepwise from light to deeper shades of green and to more colours of the rainbow. The variety of pilot cities and case studies ranges from small utopian eco-villages with philosophical roots like Auroville in India to ambitious urban projects with emphasis on energy and technology like Masdar in Abu Dhabi. At the other end are large scale real estate developments being marketed as eco-cities with very little proof of their sustainability performance.

The terminology is quite confusing since there are no universally agreed criteria for urban sustainability. Solely for the purposes of this article, the title "Triple-Zero and Energy Cities" refers to cities doing serious work with focus on energy, and an emphasis on technology, while "Eco-cities" have their roots in biodiversity, waste management and often poverty alleviation. "Green" in quotation marks refers to cities that are not taking the challenge seriously, yet. "Sustainable City" remains a goal of an ongoing transformational process.

Visions for the future are somewhat disconnected, depending on different professional world views. Planners and architects discuss urban design. Engineers may highlight technological solutions linked with energy or information technology. Those who prioritize biodiversity, celebrate the cleanup or urban riverbeds, or roofs as places for urban agriculture.

Policy makers search solutions for affordable housing, mobility and finance. But more often than not, the concept of a sustainable city continues to stand for a green city, while social, societal, employment and economical challenges seem harder to tackle than the technological and ecological ones.

Many cities have started with literal ‘greening’ by planting trees and protecting sanctuaries for wildlife. The next steps have included aspects of social sustainability in public services: providing access to freshwater, constructing wastewater purification plants, creating public transport networks, or reducing CO₂ emissions through energy savings by retrofits. The further a city has developed, the more it has tried to grasp the complexities of sustainability as present in the interdependencies of financing, urban infrastructures and services. What is seen only rarely is a full coherence of a long-term vision for the future of a city, growing from the roots of its own traditions, realistic strategies for the implementation of the vision, and an ongoing dialogue with the citizens.

Jeb Brugmann³⁵ portrays three cities as pioneers: Barcelona in Spain, Chicago in the U.S. and Curitiba in Brazil. According to Brugmann, these are the only cities where “a culture of sustainability” exists and becomes visible, a full understanding of sustainability as a cross-cutting strategy.

Green or “Green” cities?

For most cities, the first step when steering towards urban sustainability is visible ‘greening’: planting trees or saving wetlands for birds. Green ‘beautification’ of the cityscape means projects that are also easy to sell to the people. However, at the same time more roads are being built for more cars instead of looking at holistic mobility solutions. Housing and inclusion are not on the urban agenda.

Almost every city in the world is dealing with an influx of people from different ethnic backgrounds. Cultural festivals are promoted as measures to support minorities. Cultural heritage is increasingly understood

Table 2. Progressing in urban sustainability

	LAND USE	BUILDINGS / REGULATION	PUBLIC BUILDINGS	ENERGY / INFRASTRUCTURE	ENERGY / PRODUCTION	MOBILITY / INFRASTRUCTURE	MOBILITY / PUBLIC TRANSPORT	PUBLIC PROCUREMENT
"FAKE GREEN CITIES" Single measures w/o coherence	Low-density suburbs marketed as "eco cities" by real estate developers.	Legislation has some SD elements but is not enforced on ground.	A few "certified green buildings" but no monitoring.	A few stand-alone solar panels for show.	National REN policies, but taxation and subsidies do not support implementation.	Roads and highways, tree planting.	Limited bus and rail networks.	Recycled paper, otherwise the cheapest price as criterion. Corrupt practices.
"ECO CITIES" Focus on environment and poverty	Environmental protection areas, biodiversity.	Access to handi-capped as a norm.	Experimental low-tech "eco-buildings".	Solar panels.	Co-production of heat and electricity.	Bicycle lanes are built and.	CNG for vehicles.	Energy efficiency criteria used for a few items.
"ENERGY CITIES" Focus on CO ₂ emission reductions, technology	Integration of land use and mobility planning.	Energy efficiency requirements that are implemented.	Energy refurbishment of public buildings.	Solar and pv panels and wind farms. Smart metering.	Gradual shift from fossil to renewable energy sources.	More tram, BRT & metro lines are built. Speed limits on roads.	Energy efficient vehicles, some use renewable energy.	Energy efficiency criteria used for most products.
"SUSTAINABLE CITIES"! Striving towards a culture of sustainability	Focus on metropolitan areas and prevention of segregation.	Participatory urban planning and design of public space.	Sustainability criteria used also in public housing.	Local grids and smart grids.	Increasing share of decentralized energy production.	Traffic safety as a priority, public space as a realm for the pedestrians.	A multi-modal system with dense networks.	Also fair trade & decent work criteria and LCA used for all products and services.

Source: Author's elaboration.

as a resource to be kept alive, not only for tourists but also to support people's pride of place.

In the "Green" cities that try to fake sustainability, the grassroots heritage aspect disappears as events grow bigger and more commercial. Formula 1 Grand Prix, mega sporting events or Eurovision song contests require major investments, but do not necessarily add to the real quality of life after the television cameras have left. However, they are marketed as branding efforts that are necessary in the global competition of cities.

Historic preservation of a couple of landmark buildings and 'eco-labeling' a few office buildings that are surrounded by large parking areas are mere window-dressing. Race for the cheapest 'green building certificate' continues in commercial development and has no real impact on the sustainability of construction. If most public services have been outsourced or privatized, the city may not have much to say regarding the production process of the services. Those decisions are taken in tax heavens.

Triple zero or energy cities

Many cities have become aware of the inescapable links between global targets and local actions. CO₂ emission reduction measures are taken at the local level, share of renewable energy is increased in municipal utilities, and energy efficiency requirements are brought to local building codes and guidelines.

Even if there is an increasing awareness of the fact that a community's sustainability is more than greening or its carbon footprint, for the time being various visions for low- or no-carbon cities are presented. Carbon emissions are easier to monitor and measure than many other sustainability indicators, and there are great expectations on solutions that technology would offer. The visions include zero-waste, mixed-use and pedestrian focus. Cities plan to be water positive (harvest rainwater, reuse grey water, clean polluted waters), energy positive (buildings produce more renewable energy than they consume) and 'community positive'.

Steffen Lehmann³⁶ uses the concept "Green urbanism" for a model for zero-emission and zero-waste urban design, which arose in the late 1990s, promoting compact energy-efficient urban development, seeking to transform and re-engineer existing city districts and regenerate the post-industrial city centre. It promotes the development of socially and environmentally sustainable city districts, which are mixed-use and pedestrian focused. This means neighborhoods and districts that:

- respond well to their climate, location, orientation and context, optimizing natural assets such as sunlight and wind flow,
- are quiet, clean and effective, with a healthy microclimate,
- have reduced or have no CO₂ emissions, as they are self-sufficient energy producers, powered by renewable energy sources,
- eliminate the concept of waste, as they are based on a closed-loop ecosystem with significant recycling, reusing, remanufacturing and composting,
- have high water quality, practicing sensitive urban water management,
- integrate landscape, gardens and green roofs to maximize urban biodiversity and mitigate the urban heat island effect,
- take only their fair share of the earth's resources, using principles of urban ecology,
- apply new technologies such as co-generation, solar cooling and electric-mobility,
- provide easy accessibility and mobility, are well inter-connected, and provide an efficient low-impact public transport system,
- use regional and local materials and apply prefabricated modular construction systems,
- create a vibrant sense of place and authentic cultural identity, where existing districts are densified and make use of urban mixed-use infill projects,
- are generally more compact communities around transport nodes ('green TODs'), with a special concern for affordable housing and mixed-use programs,
- use deep green passive design strategies and solar architecture concepts for all buildings, with compact massing for reduced heat gain in summer,

- are laid-out and oriented in a way that keeps the buildings cool in summer, but which catches the sun in winter,
- have a local food supply through community gardens and urban farming and which achieve high food security and reduced 'food miles', and
- use multi-disciplinary approach, best practice for urban governance and sustainable procurement methods.

This list can be read as an architect's wish list when he or she is dreaming of an ideal new community. It looks at urban development from the perspective behind an urban planner's desk in the absence of direct political and economic pressures, social segregation and poverty. While trying to be concrete, listings like this can, however, be helpful in informing those professionals and decision-makers who claim that the concept of "urban sustainability" is too vague or means everything and thus nothing.

At the local government level the theory translates typically to an ambitious declaration like the one in Barangaroo³⁷, an urban development project in Sydney, which wants to be a world leader in sustainability: Barangaroo's goal is to be the first precinct of its size in the world and certainly the first CBD precinct in Australia to be climate positive. "We plan to generate more renewable energy than we use at Barangaroo, recycle and export more water than we use and reuse, reduce and recycle more waste from the city than we generate. We will be carbon neutral, water positive, generate zero waste and enhance the wellbeing of the community. We will provide affordable housing for key workers as well as green skilling and local employment opportunities. Just over 50 percent of Barangaroo will be dedicated public space, including a 2.2 kilometre foreshore walk and the vibrant, naturalistic Headland Park. To achieve these goals, Barangaroo infrastructure will be developed and implemented by the Authority and the site's developers across the whole district." An impressive list of planned actions follows the declaration.

Eco-cities

In cities that emphasize ecology, environmental measures with social and economic benefits come next after "greening" and energy. Health concerns put primary emphasis on quality of water, provision of sanitation and cleaner energy, if they are not available for all, yet. Even poor cities may have the courage to say no to mining, if they understand that in the long run, tourism is going to bring them more employment. Waste management is turned into business, sorting produces material for handicrafts and bio-waste becomes a source for bio-energy. Clogged sewers lead to a ban on plastic bags. Subsistence gardening is also promoted as part of improved land policies. First lessons about ecosystem services are learned, when rivers are cleaned and watersheds managed to prevent flooding.

These cities broaden the focus to cover the social dimension and governance of sustainable development, too. City Halls realize that civil servants and council members cannot do it alone but the process has to be democratized. Open access to information, e-governance, public hearings, popular votes, polls, co-development of services and participatory budgeting are becoming daily routine. Refurbishment of existing buildings becomes a big project, public transport systems are improved and sustainable public procurement practices are introduced.

A European research programme³⁸ explored how to combine eco-efficiency with attractive, user-oriented urban environments with a high quality of life. European cities, with their cultural and architectural qualities, should remain also in the future places where people want to live, work and travel. The study pointed out four main issues: integrated urban management and city leadership; sustainable land-use in poly-centric city regions; climate change in the urban context; and health, quality of life and public spaces.

A more theoretical ecological approach looks for conceptual models in nature rather than in technology and mechanics. Among a group of African academics,

there is currently a shift towards seeing cities as social-ecological systems in which human social systems and artifacts such as technology and the biophysical systems provided by nature are closely coupled. This shift encourages the use of ecological concepts such as metabolic flows, adaptive capacity, response diversity, ecosystem resilience and patch dynamics to find novel solutions to the structure and functioning of the city, while concepts such as ecological engineering and biomimicry guide the development of form and technological solutions. For example, Ecological Performance Standards for human settlements are developed. Coupled to this is the notion of development that aims to regenerate the functioning of the social-ecological system in such a way that development has a net positive impact.³⁹

Towards sustainable cities

Cities steering towards sustainability take it as a cross-cutting challenge. As rapidly growing migrant cities try to combat segregation and the negative impacts of extralegal economy and settlements, inclusion and inequity have become the main topics of urban **social** sustainability. Until recently, **economic** sustainability was mainly “sold” as being able to deliver “win-wins” through long-term savings, when and if resource wastage or environmental hazards are going to be prevented, or as additional employment opportunities through energy efficiency refurbishment projects, or development of environmental technologies with global markets. Now, voices are emerging that call for life-cycle thinking into all investment and sustainability criteria in all movements of money.

According to the vision of the World Bank initiative, an **Eco² City**⁴⁰ builds on the synergy and interdependence of ecological and economic sustainability, and their fundamental ability to reinforce each other in the urban context. Cities can improve the quality of life of their citizens, enhance their economic competitiveness and resilience, strengthen their fiscal capacity, and create an enduring culture of sustainability. The first of the four principles of the initiative is “A city based approach” underlining the local context. “An expanded platform

for collaborative design and decision-making” calls for coordination between stakeholders. The collaboration has to extend to three tiers: corporate operations, meaning putting own house in order, municipal services, and as regional systems. The third principle is “A one system approach” which can be read as another term for ‘integrated planning’. “An investment framework that values sustainability and resiliency” has the following core elements:

- Incorporation of life-cycle costing in all financial decision making,
- Equal attention to protecting and enhancing all capital assets: manufactured capital, natural capital, social capital, and human capital,
- Proactive attention to managing all kinds of risk: financial risk, sudden disruptions to systems, and rapid socioeconomic environmental change.

A sustainable city is never complete or finished, it is in a continuous process towards sustainability goals. As with buildings, single measures alone are not the solution but strategies that target the performance of the city as a whole. According to Jeb Brugmann, “Progressive transformation is values-driven. People and institutions only align their private strategies and instrumental uses of the city to a common strategy because the ends create a more compelling value for them. Achieving strategic alignment in the urban free-for-all is nearly impossible if local practices of urbanism do not offer a value proposition that relates to the underlying culture of a good part of the city. – This cultural dimension of cities is perhaps to most subtle aspect of urban strategy.”⁴¹ Trying to understand the transformational capacity of a city requires an ongoing, careful analysis of local values and history.

Are we learning from pilot projects and eco-cities?

Serious sustainability experimentation is a critical part of innovation. But scaling it up is a challenge, because many of the initiatives are site- and population-specific. However, it is possible to take broad principles and apply them elsewhere with the inspiration that comes from seeing a whole system work in one place. One of

the questions regarding the relevance of pilot projects and best practices is whether the learning through experience helps us move forward faster.

Are we really learning from experience, good and bad? In fact, we might learn more from the bad experiences which, understandably so, are not broadly disseminated. From the good ones, reliable and comparable data are not always available, and the platforms for information sharing are too few. It is often difficult to make the distinction between greenwash and real progress. Many experts may be well informed about development alternatives but that is not enough, political decision makers should learn, too.

In conference presentations extremely few courageous speakers show the real challenges. Instead, nice pictures of the city are carefully zoomed so that no one sees the shady parts of the city. Festivals and one-off events are good photo opportunities, but to what extend do they add to the real quality of life?

There is also the risk that pilot projects represent lifestyles that are inherently dependant on high levels of consumption. These solutions respond to the requirement of protecting the present high standard of living in the developed world at lower environmental cost. This approach necessarily calls for high cost technological solutions. The need of the developing world is diametrically opposite. What is called for is a progressive upgrading of the present standard of living with modest increase in environmental cost – and to evolve toward a lifestyle of sufficiency, security and dignity.

This is not to say that best practices are not needed or that conferences are not useful but that information needs to become more facts-based and more systematic. Methods for information sharing also have to reach the right people in time.

Integrated policies for sustainable cities

A governance system made out of sectoral silos with poor coordination and coherence leads to lack or

absence of horizontal integration. The environment department may have a perfect vision, which gets approved, but is never checked against the land use plan, the transport plan or the housing strategy. Energy production, water management and provision of public transport may not be in the reach of local political decision making at all. Financial frameworks overrule. Incentives are split not only along supply chains but also among the decision making silos. Contradicting decisions, regulations and measures at different levels support unwanted developments. If the use of private car for daily commute is subsidized more or taxed lower than using public transport, the result is predictable. In cases like this, cities cannot counteract negative impacts of national legislation.

Sustainability *is* about synergy, “combined effort being greater than parts”. The imperative of synergy brings about an increased focus on the regional scale, larger than that of buildings, neighborhoods or even entire cities. Integrated urban planning means layering multiple maps on top of each other and looking for solutions that take into account both natural resources, agricultural reserves and the impact of man-made structures.

Most urban sustainability challenges do not respect borderlines drawn on maps. Infrastructure for public transport, BRT networks or trains don't have to stop at the city border. Housing and related basic services are linked with mobility solutions. While most people do not live and work in the same area any more, planning and decision-making have to grasp the bigger picture. It is also the task of national governments to support and be involved in **vertical integration**, cooperation between levels of governance, which includes appropriate decentralization of decision making powers.

Sustainable urban infrastructure

Urban infrastructure can be understood in a broad sense, not only as ‘pipes’ for freshwater and wastewater, communication, electricity and heating, roads and rails, networks for waste management,

or public transport networks. Urban infrastructure covers all the 'hardware' and utilities that are needed to produce and deliver the public services that the city is responsible for: basic healthcare, education, social services, elderly care and maintenance of public streets and buildings for example. Even governance needs infrastructure.

The task of sustainable urban infrastructure is to secure universal access to basic services, which is the prerequisite of inclusive and equitable cities. Pricing and cross-subsidies can distribute the burden of cost-sharing. Cities have to consider carefully how far, to secure the sustainability of service delivery, it is imperative to keep the decision making concerning basic infrastructure in their own hands, and where it makes more sense to outsource parts of the production chain.

From the perspective of resource consumption, sustainable infrastructure has the task to save finite resources, or, as far as they have to be used, to consume them more efficiently, and to increase the share of renewable resources, recycling and reuse of materials. One of the goals is to prevent urban sprawl and to minimize mobility needs. The infrastructures themselves are utilized more efficiently, when the networks serve more people at shorter distances. Because resources are used in production, consumption and wastage, the cycle can be impacted from all sides: supply and demand, and reduction of waste at every step.

Regarding infrastructure, cities are at different crossroads: older cities with their existing structures are in need of refurbishment and incremental or radical improvements, while urban areas to be newly built have to make the choice between either business-as-usual solutions or systemic changes. Quantum leaps will require, for example, a full shift to renewable energy sources and distributed energy production, or mobility solutions that are not based on the private automobile.

There are great hopes that Information and Communication Technologies (ICT) are going to help de-materialize a whole range of components in the delivery of public services. ICT and smart grids will, eventually, be able to eliminate some of the urban mobility needs, through services such as teleconferencing, telecommuting and distant work, virtual shopping and digitalization of products like books and music. ICT can certainly be helpful in making urban governance more transparent, as well as in opening access to information and to many services. ICT and smart grids may revolutionize energy, which will be discussed later.

Transport and urban density

According to Alain Bertaud⁴² a city structure is defined by:

- the average density (consumption of land per person)
- the spatial distribution of densities and population
- the pattern of daily trips.

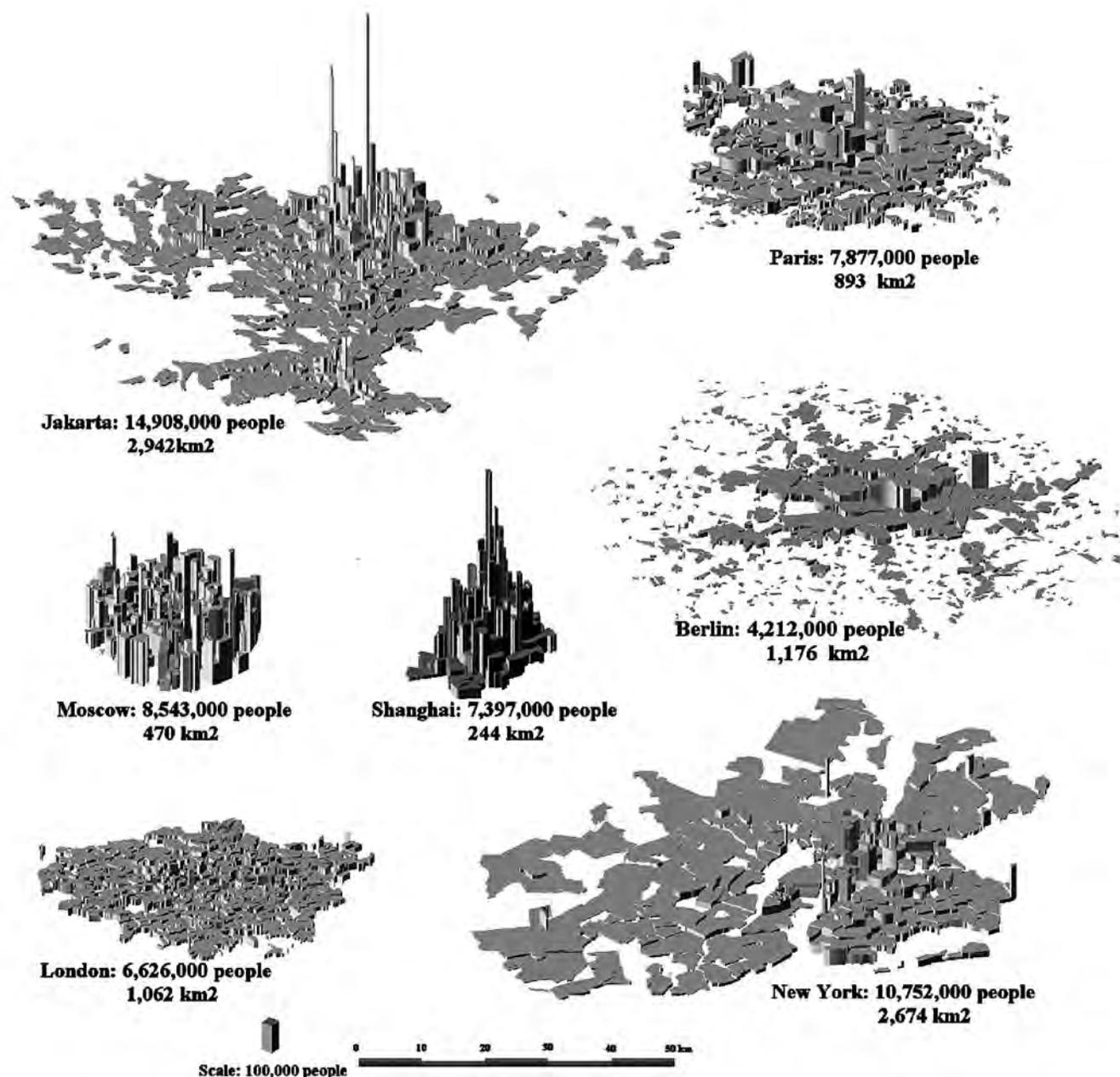
A city structure is deficient when commuting distances for a significant part of the population are too long to be travelled within a reasonable travel time or/and at a reasonable cost. The structure is also deficient if the spatial distribution of population and the pattern of trips are incompatible with the main mode of transport affordable to the poor. The population density of a city is an indicator of land consumption. The lower the density, the larger is the city built-up area, the longer is the commuting distance. There are no "optimum" densities, but low densities are incompatible with transit, and high densities are incompatible with private cars as a main mean of transport.

Post World War II North America is an example of how the development of extensive highway systems had an enormous impact on suburban development. **Cars were popular and affordable**, land was cheap on the periphery of cities, and government policies including cheap mortgages promoted home ownership. The US 1956 National Interstate and Defense Highway Act poured vast amounts of money

into highway systems that made suburban living and commutes to work and shopping feasible. Zoning regulations originally developed to address the overcrowded and unsanitary cities of the 19th century resulted in a separation of uses that reinforced car dependency.⁴³

Throughout urban history, cities would grow around harbours. At regional and country level, the importance of **logistics** networks and infrastructure keeps gaining weight. The growing volumes and speed of international trade require bigger and more efficient airports, harbours, feeder rails and roads.

Figure 4. 3D representation of the spatial distribution of population in 7 metropolis represented at the same scale



Source: Bertaud, Alain, power point presentation made in Pretoria.

At present, transport solutions are linked with three primary concerns: urban sprawl, climate change and equal access to services and workplace. A major share of **CO₂ emissions** is caused by transport, and to reduce them, solutions range from technological, behavioural and fiscal to infrastructural. The IEA projects⁴⁴ that all of the net increase in oil demand (2010-2035) will come from the transport sector in emerging economies, as economic growth pushes up demand for personal mobility and freight. The total number of passenger cars would double to almost 1.7 billion in 2035.

Urban sprawl is mostly accredited to reliance on the private car as the prime mode of transport. Location of parking at home and at destinations is decisive for the consumer's choice: if the car is close to you, you use it. However, also train networks can force people to move out of city centres. This hits the poorest the hardest, because the more moderately priced housing is located far away along the railroad line. As a countermeasure, some cities make an effort to provide space for low-income and even informal housing near central areas, within walking distance to employment opportunities for people with lower skills.⁴⁵

Cities have always been places that offer better **access** to services than rural communities, but some cities are now losing this advantage. Urban sprawl is a challenge not only because of the increased fossil energy consumption, air pollution and CO₂ emissions. Travelling greater distances takes more time, the street networks take up more valuable urban land and all other urban infrastructures are not used efficiently. As a societal loss, human scale structures and activities disappear from the urban landscape, be they street vendors, cafes or any other human encounters.

“Congestion” is frequently identified by people as the main problem of urban transport. This leads to a diagnosis, which starts by looking at cars. Research tends to focus on existing structures, which impact people's behaviour. As a result, research provides data on cars, leads to requests for more structures for cars, and traffic planning focuses on cars even if their share

of mobility in urban centres may be under 10 percent. This is a dead-end approach.

Non-motorized traffic is being discussed in every city, not least because walking is in many cities the only choice for the poorest citizen. However, also walking and cycling need a proper infrastructure to be safe. Sometimes people crossing streets are considered the cause for traffic accidents, instead of the drivers. Cities don't have Departments for Pedestrians and Cyclists, yet. Zero-emission modes of transport have no market value, and they cannot be financed through land development or loans.

1.4 million people are killed on the world's roads each year, and 50 million people are injured, many disabled as a result. 90 percent of these casualties occur in developing countries, where road crashes kill more people than malaria. The economic cost to developing countries is at least US\$100 billion a year, because injuries place immense burdens on hospitals and health systems.

Sustainable buildings and construction

In cities, we live in a built environment that should be in balance with the natural environment. In terms of **resource use**, buildings take up a lion's share. 25 to 40 percent of produced energy is consumed in the construction and operation of buildings. This results into approximately 30 to 40 percent of all CO₂ emissions. Of solid waste, 30 to 40 percent comes from construction. In terms of **economy**, buildings represent a massive share of public and private property. As we have learned from recent collapses in different parts of the world, the stability of financial markets is linked with the long-term value of real estate as collateral. In terms of **employment**, the construction sector generates 5 to 10 percent of jobs⁴⁶. The construction industry is possibly the second largest source of employment after agriculture.⁴⁷ Furthermore, buildings and the real estate business provide also service sector jobs in management and maintenance.

The estimated rate of **urbanization** means that in 2030 about 1,400 million more people will live in cities than in 2010. About 1,300 million of the new city dwellers are going to be in developing countries.⁴⁸ They'll all need homes, services and places to work – new buildings. In the coming years, there will be more construction on the globe than ever before. The impacts of those buildings are long term.

The urgency of climate change mitigation has meant that energy consumption and CO₂ emissions from buildings and construction have in recent years been discussed more than other **ecological** aspects. The complete picture is bigger. **Economic sustainability** counts both the initial investment in land, design and construction, and the cost of maintaining and operating the building – and its value as collateral. **Social and societal sustainability** cover issues such as availability of appropriate housing for all, fair trade of construction materials, transparency in tendering for contracts, and protection of cultural heritage. Sustainable construction also means decent jobs, for example in maintenance and renovation of buildings and infrastructure.⁴⁹

Sustainable construction does not have to be high-tech, quite the contrary. **Passive design principles** mean low-energy, zero-emission designs, which dramatically reduce building energy use. Buildings can take advantage of cooling breezes and natural cross-ventilation, storing solar heat or shading and night-flush cooling, depending on the season, maximizing day-lighting and similar basic principles.

Not sufficiently recognized is the need for conversion of existing technologies into simpler affordable forms, and for innovations to address the needs of the present developmental stage as well as local specificities of climate and of building methods. There is a critical need for research and development of innovative affordable solutions for operational energy requirements for thermal comfort in buildings, and for low embodied energy construction materials and techniques.

In countries with a large stock of existing buildings, its renovation is crucial. Experience in northern Europe indicates that low-income housing can be successfully retrofitted for profit. The Million Homes programme in Sweden is a good example of this. Homes built to tight budgets in the 1970s are now being renovated to a high standard with a heavy focus on energy efficiency that can take them right down to passive performance levels. Savings from reduced energy costs can be an important element of economic justification for such projects.⁵⁰

In terms of legal and regulatory changes, the rate of change needs to accelerate. Legislation and regulation should be based on best practice rather than compromise. When a particular solution is proven to be commercially viable, it should become the benchmark. The gap between cycles of legislation and regulation needs to be tighter. If business is to take a greater role in solving the challenges of today, greater consistency and longevity of signals in the markets are essential. Too many examples exist of regulatory, legislative and price signals being pushed into markets by governments only for them to be changed before the end of term for reasons of political expediency. – Policies probably work best within a national context. Supra-national policies such as EU Directives may or may not help.

The Intergovernmental Panel on Climate Change (IPCC)⁵¹ highlighted the European Union Directive on the energy performance of buildings (2002) as one of the most comprehensive pieces of regulation targeted at the improvement of energy efficiency in buildings. The more recent directives require that as of 2021 all new buildings will have to consume nearly zero energy, and the energy consumed will have to originate to a large extent from renewable sources tapped by the building or in its vicinity. All buildings undergoing major renovation (25% of the surface) will need to improve their energy performance. The legislation required member states to list incentives, from technical assistance and subsidies to low-interest loans, for the transition to near-zero-energy buildings.⁵²

However, without strong control from the centre and even stronger oversight of implementation, no policy is going to be effective. That is why zero tolerance on corruption is fundamental also in construction.

For the assessment of building performance, more than 600 **rating systems** are available worldwide. They span from simple energy consumption evaluation to life cycle analysis with ecological focus to total quality assessments.⁵³ The systems have different tasks, depending on which questions they are supposed to answer. Some assess the predicted performance at the design stage, others the actual performance of the existing building. To what is the performance of the building being compared – is it compared to set standards or to other similar buildings? A rating can give a result only relative to a norm or benchmark.

Before selecting a tool, some questions should be asked: For what purpose is the performance assessment needed – e.g., for evaluating returns on real estate investments or for measuring national contributions to climate change mitigation? The most simple certificates that are marketed worldwide, are popular among the real estate development and investment industry that uses them for branding as tokens of reliability.⁵⁴ A system with a number of different level indicators is tempting for users that are more interested in easy credits than ambitious development.⁵⁵ It allows for cherry-picking, while some credits are much easier to fulfill than others; for example arranging space for bicycles or providing office spaces with windows as compared with reducing total annual CO₂ emissions from the building by 30%.

The increased exportation and importation of the major assessment methods worldwide is also an exportation and importation of their cultural underpinnings and has potentially adverse long-term consequences for promoting regionally-specific practices.⁵⁶ The selection of right performance levels and weighting criteria needs good understanding of local conditions. If this is missing and the chosen criteria are too easy,

the impact remains insignificant or even negative. Green Rating for Integrated Habitat Assessment (GRIHA), the national rating system of India, is an encouraging example of a region-specific tool. For the time being, it is being promoted throughout the country and a number of ministries and states have already adopted it. Government of Karnataka recently announced mandatory compliance with GRIHA, adopting the rating system for all future construction.⁵⁷

Experts are concerned that, first of all, ratings and certificates do not push development forward fast enough but actually stall it. Secondly, the impact of a single building is hardly ever relevant unless it is part of a community and served by infrastructure that are sustainable. Another way to say this is to call for integrated planning, systemic thinking and holistic viewpoints also when buildings, construction and renovation are concerned.

A building does not become sustainable simply by adding up 'green' construction materials and elements. The long supply chain that involves several actors is largely dysfunctional. It has typically been designed to transfer risk from one party to another, and each party in the supply chain is has been accountable for just their own piece⁵⁸. However, from the point of view of sustainability, only **the performance of the entire building during its lifetime** matters. This is why policies are moving away from prescribing 'fool proof' solutions, like telling how thick the thermal insulation of a roof should be, to asking for a minimum energy performance of the building, for example.

There are strong expectations that certificates or hi-technology solutions could solve the challenge. That is not going to happen. Innovations at the low-tech end have much bigger impact, because their volumes are radically bigger. For example the global trend towards thinner exterior walls has meant that the facades have no thermal mass and the need for air-conditioning (AC) has exploded. The solution is not "more green AC equipment" but buildings that perform better, with thicker walls, maybe.

Sustainable buildings continue to be regarded as a marginal share of new construction, the icing on the cake. The lack of understanding of the potential of sustainable construction and its co-benefits for the poor is a bigger barrier to mainstreaming sustainable construction than lack of technology. At the same time, lack of consumer demand fails to stimulate competition on the market, supported by lack of incentives and split incentives along the supply chain of the sustainable building process. Municipal building controls don't use their muscle but reinforce the implementation gap. Legislation, rules and bylaws may exist nationally, but their implementation is not enforced locally.

Energy systems for decentralized “prosumption”

The most recent World Energy Outlook⁵⁹ by the International Energy Agency (IEA) presents a gloomy picture: There are few signs that the urgently needed change in direction in global energy trends is underway. Global primary energy demand has pushed CO₂ emissions to a new high in 2010. Subsidies that encourage wasteful consumption of fossil fuels jumped to over \$400 billion. The number of people without access to electricity remained at 1.3 billion, around 20% of the world's population, and 2.7 billion people still rely on the traditional use of biomass for cooking. Despite the priority in many countries to increase energy efficiency, global energy intensity worsened for the second straight year. The IEA notes that non-OECD countries account for 90% of population growth, 70% of the increase in economic output and 90% of energy demand growth over the period from 2010 to 2035.

After the accident at a **nuclear power** plant in Fukushima, Japan, people in many countries have expressed strong views against increasing the production of nuclear energy. Germany made a renewed decision to close down its nuclear power plants. According to the IEA, however, while creating opportunities for renewables, a low-nuclear future would boost demand for fossil fuels. At the same time, the strong vested interests at national and international

level for status quo on fossil fuels and nuclear energy are no secret. Cities are quite powerless unless they have a firm grip on municipally owned or otherwise local energy production that is based on local renewable sources.

IEA's message about infrastructure is particularly alarming: Four-fifths of the total energy-related CO₂ emissions permissible by 2035 in a **450 ppm scenario** are already “locked-in” by our existing capital stock (power plants, buildings, factories, etc.). If stringent new action is not forthcoming by 2017, the energy-related infrastructure then in place will generate all the CO₂ emissions allowed in the 450 scenario up to 2035, leaving no room for additional power plants, factories and other infrastructure unless they are zero-carbon, which would be extremely costly. But delaying action is a false economy: for every \$1 of investment avoided in the power sector before 2020 an additional \$4.3 would need to be spent after 2020 to compensate for the increased emissions.

Energy production and distribution tend to be the sector where the greatest expectations are put on much lauded new technologies, while energy savings – a behavioural challenge – and energy efficiency of products and service delivery are not promoted with the same enthusiasm. However, it would be highly uneconomical to produce renewable energy with expensive technologies only to be wasted in inefficient products, buildings or infrastructure.

Existing **technologies** can increase the efficiency of resource use, for example co-generation (CHP) and tri-generation of electricity, heating and cooling. Efficiency of infrastructure is increased by district heating and cooling systems. However, as long as coal or other fossil energy resource is used, the technologies reduce the CO₂ emissions only marginally. A small number of frontrunners, such as Masdar in Abu Dhabi and San José in California have set the ambitious goal of being carbon neutral or having zero emissions within a certain time span.

The City of Växjö in Sweden is famous for using biomass as fuel for heating. The biomass consists of woodchips, which are a side product of the forest industry in the region. The discussion about the possible serious conflicts between food security and non-local production of biomass continues. However, also ecologically viable suggestions are presented, such as reforestation of wastelands to produce palm oil, using the ground and topsoil for small-scale farming.

Some of the most promising technologies are in building-integrated PV, urban wind turbines, micro CHP and solar cooling. It is possible to have on-site electrical generation and energy storage in combination with a smart grid, which integrates local solar and wind generation, utilizing energy-efficiency in all its forms. Solar hot water systems are already compulsory in some cities.

Smart grid solutions integrate technologies and services in the fields of IT, data communication, energy automation, and rail electrification. They pave the way for efficient grids, intelligent power distribution and consumption as well as electromobility and smart buildings. Created synergies mean that electricity prices can be flexibly adapted to supply and demand, and markets can better react to price fluctuations. The integration of distributed generators and consumer management through microgrids and demand response becomes possible. In the field of rail electrification, for example, modern converters connect public grids and railway networks transparently, and railway systems can be used as energy storage facilities. Energy users become “prosumers” with smart grids: they can be both power consumers and producers and control their power consumption in a cost-optimized and environmentally responsible manner.⁶⁰

In Smart City visions intelligence and remote sensors are built into the very fabric of the city and its buildings and use computing power to monitor and constantly adjust for optimal efficiency.⁶¹ Even if high-tech is not the only answer to more sustainable systemic energy solutions, some municipalities

are already testing smart grids at city scale. Evora in Portugal is among the pioneers. The intelligent technological platform aims to equip the electricity grid with information and devices to automate grid management, improve service quality, reduce operating costs, promote energy efficiency, and increase the penetration of renewable energies and electric vehicles. It will be possible to control and manage the state of the entire electricity distribution grid at any given instant.⁶² The City of Rotterdam in the Netherlands is implementing a project for smart grids in homes and a project in which homeowners invest in a collective solar energy generation system (self-supply). This is going to be a sizeable practical trial with smart grids and a trial with the self-generation of solar-energy.⁶³

Jeremy Rifkin has spoken⁶⁴ about democratizing energy through the post-carbon Third Industrial Revolution and a new distributed social vision. This is not an off-the-shelf implementation plan but offers food for thought while it suggests linking existing Information and Communication Technology (ICT) solutions with local renewable energy sources. The vision is founded on his analysis of how major changes in human consciousness have occurred throughout history. They take place when two things happen simultaneously; new forms or resources of energy are discovered, and communication methods are revolutionized, which leads to different ways of organizing communities. According to Rifkin, the contemporary change is based on a new biosphere consciousness and the ICT revolution, which has introduced also the concept of open source and flat hierarchies. While old energies require massive infusions of investment and military power to secure them, the third industrial revolution is going to distribute the energies found on every square feet of the earth. Every creature on this planet has a fundamental right to their fair share of the energy, he claims. Rifkin opposes heavy new infrastructure, such as the European Supergrid plan, but promotes energy cooperatives and an “intergrid” similar to the internet.”[...] the same design principles and smart technologies that made possible the internet, and vast

'distributed' global communication networks, are just beginning to be used to reconfigure the world's power grids so that people can produce renewable energy and share it peer-to-peer, just like they now produce and share information, creating a new, decentralized form of energy use. We need to envision a future in which millions of individuals can collect and produce locally generated renewable energy in their homes, offices, factories, and vehicles, store that energy in the form of hydrogen, and share their power generation with each other across a continent-wide intelligent intergrid. (Hydrogen is a universal storage medium for intermittent renewable energies; just as digital is a universal storage mechanism for text, audio, video, data and other forms of media.)"⁶⁵

Even if this **futuristic vision** may seem remote to the majority of existing cities today, it is most relevant for those being refurbished or built now. After the prevalence of large centralized solutions the new aim is to have a **distributed** energy supply through a decentralized system, utilizing local **renewable** energy sources. This would transform buildings and city districts into local power stations, which would use solar photovoltaic (PV), solar thermal, wind (on- and off-shore), biomass, geothermal power, mini-hydro energy and other renewable fuels and technologies. Also residual heat, waste and methane from biowaste can be used as local energy resources, biogas in particular as a fuel for vehicles.

All of these visions put a heavy burden on cities in helping builders make every house an energy producer. This requires information centers, campaigns and fair subsidy systems as well as creating demand to get banks interested in lending for small operators. Some cities or metropolitan regions have decided to establish an energy information office. The German Federal State of Nord-Rhein-Westphalia has also an "Energy consulting bus" driving from place to place to meet people who need advice.

As a successful policy tool to push a shift to renewable energy, the German Feed-in-Tariff (FIT) is often quoted. It was introduced in 2000 and has been applied in

different forms in over 50 countries worldwide. An FIT provides three key provisions to renewable electricity generators: a guaranteed grid connection, a long term contract, and a fixed price sufficient for a reasonable return on investment.⁶⁶ The FIT is not an uncontroversial solution. The technological solutions and new jobs don't always support the local economy, as anticipated. The policy has also been criticized for being too expensive. – We continue to be long ways from transparent and fair pricing of energy to guide the choices.

Cities as agents of behavioural change

Researchers⁶⁷ point out that urbanization as such does not cause increased resource use per person. For the same level of income, material and energy use per capita is usually lower in cities than in the rural context. The reason for higher consumption in cities is the rising level of household income. This creates the sustainability challenge of the upwards mobile urban lifestyle.

Theoretically, there is only one way to sustainable consumption: the absence of unsustainable alternatives! As long as the sustainable product or service is only one choice among several, it is difficult to blame the citizen for choosing 'wrong'. But cities are not powerless, quite the contrary.

If public transport is not available, reliable and comfortable to use, everyone who has the choice, is going to take their own car. If the pedestrian environment is not safe and pleasant, the car is preferred even for short distances, which would be a nice walk away. Measures that may seem marginal and don't need huge investments can be decisive: giving priority to pedestrians, not forcing them to climb steep stairs through either dark tunnels or high overpasses to avoid traffic, painting stripes for pedestrian crossings, installing traffic lights, providing broad sidewalks and planting trees to shade public spaces from excessive sun. To make parking available at a low or no cost in city centres is an invitation, while the opposite makes public transport an easier alternative that saves time and money.

Whatever is built or refurbished by the public sector, either for its own use or with public subsidies, should go far beyond the minimum legal requirements in energy and water efficiency and waste management. When making a decision about energy production, the city decides on behalf of its citizens, whether they can shift to renewable energy or not.

Sustainable public procurement⁶⁸ can ensure that all products and services that are purchased with public money, fulfil the criteria of sustainable production – not only the envelopes and a few cars but everything; laundry and cleaning services, the fire trucks and public transit buses, catering in hospitals, schools and cafeterias, everything! The citizen may have a hard time finding organically produced food from the region in supermarkets, but the city, for example, can offer public space for free for local farmers to sell their sustainable products.

Governance for more sustainable cities



Looking with sharp eyesight, cities can be read as political text; haphazard high-rise developments with glass facades next to informal housing without basic services and coherent public space witness of missing political will, corruption and lack of holistic visions. Cities and buildings always reflect the values of their decision makers at the time. Most countries have excellent planning laws in place, but they don't get implemented, or they are bypassed. Sustainability targets are left hostage of poor governance and exclusion of citizen.

The power space of cities

The old centralized message to cities used to be that “national governments need to have cooperation from

cities to implement the plans decided above”. This mindset is slowly changing, even if ministries often tend to think that they know better than the municipal civil servants. This means a continuous balancing act regarding the right degrees of decentralization and centralization – that is, defining the mandate and power space of cities.

Ten years ago, water resource management was the common priority issue for municipalities in all world regions, regardless of their economic situation. Similarly, all cities listed lack of both financial support and national government political commitment as key obstacles to greater success.⁶⁹ In this regard, not much has changed, but new items have been brought to the urban agendas, as has been discussed

above. This has meant greater challenges to urban governance and cities' ability to involve different levels of government, citizen and other stakeholders.

Urban sustainability requires appropriate structures and open processes, which continue to be missing in many cities. Even if decentralization, or subsidiarity, as the Europeans call it, and public participation are broadly accepted as worthy goals, at all levels there is an inherent reluctance to delegate power. But the sustainable city cannot be managed from above and outside, it requires a democratic city government and leadership, chosen by the people and accountable to them. An electoral system alone does not implement all contemporary requirements of democratic governance, it requires ongoing discussion and platforms for the debate. A local government must have the right powers, finances and human resources to enable it to develop high quality public policies, and to work with other levels of government and with other municipalities.

It is always going to be a political decision to define "the power space" of cities, how broad or how narrow it could and should be. What can cities influence, what not? Delegation of powers, of course, requires that the corresponding capacity and financial and human resources follow. Table 3 attempts to raise some of these questions.

Sustainable financing for cities

"Polluter pays" is the well known principle that can be adopted in cities, as well. Real estate tax related to energy efficiency, cross-subsidies (parking to public transport etc), fees dependent on consumption (the more you use water, the more you pay per litre), or subsidies with sustainability criteria are just a few examples of how the principle can be implemented to get financial resources for the local government. Many cities are not in the position to issue municipal bonds, but depend on national governments for access to financial and capital markets. The initial lure of public-private partnerships (PPPs) as an easy source of finance may have weakened after cities have faced the challenges linked with them.

Finding a financing model for cities and metropolitan areas is a balancing act between local and national governments. If local governments move toward budgetary independence, significant tax assignment is implied. The property tax and user charges alone will not carry the expenditure load. Local residence-based earnings tax or a share of commerce/industry tax can lead to unhealthy tax competition within the area, while the other solution is heavy reliance on intergovernmental transfers to finance local services.

There is room for metropolitan (area-wide) governments to contribute more to the financing of services in the metropolitan area. A residence-based income tax, with an appropriate commuter charge, is an alternative. Taxation could support an intra-metropolitan equalization fund and revenue sharing. Some other taxes that are appropriate for a metropolitan taxing district are the property tax, or at least the commercial/industrial portion of it, and taxes on motor vehicle licenses. User charges would continue to play a major role in financing the regional district, but grants from higher level governments would not.⁷⁰ A too heavy dependence on national funding would work against the ideal of subsidiarity and independence. Also, the principles of national funding to change depending on the priorities of the government in power, but the metropolitan area has to be able to work with longer-term visions than national electoral periods.

However, as essential as the source of financing are the criteria that are used for investments and service provision. This is the area where sustainability criteria are urgently needed, for all decisions that concern the use of public money.

Table 3. Do cities have the mandate and resources to drive sustainability?

	LAND USE	BUILDINGS / REGULATION	PUBLIC BUILDINGS; leading by example	ENERGY / INFRASTRUCTURE	ENERGY / PRODUCTION; leading by example	MOBILITY / INFRASTRUCTURE	MOBILITY / PUBLIC TRANSPORT	FINANCING
Local autonomy	Approval of land use and zoning plans	Approval of city-specific guidelines, full powers in building permits	Complete (as far as fulfils national minimum standard)	Depends on financial resources.	Varies; some have own utility, others rely on multinational providers	Decision on construction and maintenance of streets, walkways, bike routes	Almost complete autonomy to plan the service and cross-subsidize	Major investments (e.g. metro) need national funding
Dependence on higher levels of govmt or private sector	If national government changes the plans, are the criteria transparent?	Minimum standards set by (supra-) national legislation	Is national funding required and conditional?	High due to even supra-national grids	High; strong lobbies, (supra) national directives	Is national funding needed? Has the infrastructure national roles?	Does national legislation guide taxation and subsidies?	Depends on the need for subsidies from national gov.
Cities' possibility to influence choices and behavior of individuals	Urban plans influence density and mobility patterns, time spent	Building control can guide builders and monitor implement.	Selected solutions can impact user behavior and experiment		High if own production; pricing as incentive, supply of renewable energy	High; access to public transport and safe walkways, price of parking	High; pricing and quality of public transport services	High; use of cross-subsidization as stick and carrot
Main bottlenecks	Corruption, limited land ownership of the city	Corruption, lax follow-up	Poor maintenance	Lack of neighborhood scale infrastructure for renewable energy	Lack of Feed-in-Tariffs and similar incentives, lack of appropriate technologies	Path dependence on existing road networks, designed for cars only	Lack or poor quality of public transport	Lack of financial resources and limited access to credit

Source: Author's elaboration.

Transparent governance

Transparency International (TI) is a global civil society organization that publishes annually a corruption perceptions index, which measures the perceived levels of public sector corruption in 183 countries and territories. The index uses data from 17 surveys that look at factors such as enforcement of anti-corruption laws, access to information and conflicts of interest. TI states that corruption continues to plague too many countries around the world. Some governments fail to protect citizens from corruption, be it abuse of public resources, bribery or secretive decision-making.⁷¹

The public sector is a big client for the private sector. For the OECD countries as a whole, in 2002 the share of total procurement (consumption and investment expenditure) of GDP for all levels of government was

estimated at 20% and for the non-OECD countries at 14.50% of GDP. Across Europe public procurement makes up around 17% of GDP, but at the local/regional level public procurement can easily reach the double of that in terms of percentage of public expenditure. For example, public procurement accounts for 40% of the city budget in Helsinki and 30% in Stockholm.⁷²

The bigger the deal, for example large infrastructure projects, the more tempting it is for bribery. The purpose of corruption is to avoid meeting agreed targets or to deviate from rules of equity. It often starts when powerful interest groups lobby against the introduction of sustainability policies, or a landowner does not want to adhere to a land use plan, or an industry tries to cover up pollution. The real estate and construction sectors are infamous for shady deals, and local authorities are often unwilling to curtail

the operations of polluting industries that provide significant local employment, fiscal revenues and economic growth. Incentives for lax enforcement of environmental and labor policies are even stronger when local authorities or individuals within them directly own stakes in these polluting industries or are improperly influenced by them.

Transparency of sustainable governance means both zero tolerance on corruption and open access to public information. India, for example, has a Right to information -act and as a practical measure, the City of Bangalore has installed e-kiosks, where citizen can get in touch with the municipal administration.

Inclusive and participatory governance

The Local Agenda 21 (LA21) movement was rooted in the Agenda 21 of Rio. National governments encouraged local authorities to implement the Agenda 21 locally, as recommended in Chapter 28 of the document. The simple idea was to bring the goals of sustainable development to the local level, the level of governance closest to the people, and the level where decisions hit the ground in a most concrete way. In cities and villages, decisions turn from declarations and papers to brick and concrete, water and energy, primary education and healthcare, to housing, roads and parks – or don't. Local Agenda 21 was designed to be a participatory process, through which citizens, together with civil servants and local politicians, would create a common agenda for development. Since 1992, thousands of city councils have approved a Local Agenda 21. In 2012, the need for inclusion and participation is more urgent than ever and we'll have to find new platforms and processes for that, not only to follow encouragement from outside but to implement local self-government from within and democratize sustainable development.

City Councils and Mayors elected by popular vote are regarded as symbols of local democracy. Representative democracy is essential, but cities in all parts of the world have learned that it has to be complemented by an active and well-informed

involvement of citizen. On the one hand, user experience is necessary when public services are developed. In this regard, cities are looking for models from the industry that applies methods such as focus groups, customer surveys and user tests when new products are developed, before they are brought to the market. On the other hand, inclusion of all groups – established and marginalized, women and men, young and old, migrants and natives – means that the challenge of equity is taken seriously.

It is important to acknowledge that governments act differently in different places. Similarly, it is crucial to see the enormous potential of informal cities and to develop tools and processes for co-development. While levels of participation in some form of collective action have increased, even if the forms may not always be recognizable as a coherent social or political force, they are opportunities for participants to rehearse various practices of negotiation, collaborative exchange, and strategic planning.

Many more formal methods of public participation have already been widely tested and practiced, different forms of e-governance and participative budgeting as prime examples. Hardly anything else can express more clearly the local government's confidence in the citizens' ability to decide about their own future than handing them the 'purse strings', allowing a direct involvement with some of the investments or services in their city.

Interactive internet and the so called new social media are exciting tools but they cannot be the only platform for participatory governance. However, expanding ICT use can enable people to play an active role in policy design and decision-making processes, by providing the tools and networks through which to make their voice and needs heard. The two-way communication between citizens and government officials, enabled through ICT and especially through mobile technologies and social networks, is critical for democratic processes for and ensuring that people in underserved areas have equal voice. Helen Clark, UNDP Administrator, spoke at a conference

on Cyberspace about the transformative power that voices from the grassroots can have. "Where governments are not responsive – these channels also take on a life of their own – as in the Arab States region this year, where we saw the demands of people increasingly communicated through social media channels, such as Facebook, Twitter, blogs, and text messages, rather than being controlled through or blocked by traditional media and elected politicians. I am told of one demonstrator who said that they used Facebook to mobilise, Twitter to live report, and YouTube to broadcast their stories."⁷³

Learning from Porto Alegre and participative budgeting⁷⁴

The learning from Porto Alegre goes far beyond the use of tax money. Since 1989, the city has supported community participation. Every year, more than twenty thousand people discuss how to use around 17% of the city's budget. Organised communities negotiate, establish criteria for resource allocation, present their priorities and control government expenditures.

The process of participative budgeting required a transformation of existing governance structures. The beginning was fraught with difficulties and was met with scepticism by a public already tired of empty promises. Neither the administration nor the people had a clear idea of what they were creating. At first, as expected, the population insisted in having the works that had not been executed so far. And this was a very tall order.

A first step was to improve municipal financial capacity to be able to face the repressed demands that now found their way. In 1989, 98% of the municipal budget was already committed to pay civil servants. More than 15 bills concerning taxes were sent to the City Council, all of them following the principle "who owns more pays more". 14 were approved, with strong support from the population. Garbage collection service and other fees were updated.

The local government and communities agreed on a division of the city into sixteen different regions for investment allocation. The process involves a series of regional popular assemblies ("rodadas" or rounds) which review the previous year's public investments, local taxation and next year's budget. Each region elects two representatives (volunteers from the communities) to the "Participative Budget Council" (COP), which is responsible for preparing the city budget proposal and establishing the criteria for next year's investment allocation as well as controlling its implementation. The Participative Budget institutions, such as the COP, are autonomous and not legally institutionalised. This characteristic provides independence and flexibility and allows a continuous improvement of the process.

From 1994 on, next to the regional assemblies, five "thematic plenaries" were created to debate and elaborate city-wide issues: transport, economic development and taxation, city organisation and urban development, health and social assistance, and education, culture and leisure. Each thematic plenary also elects two representatives to the COP. The participation mechanism is all-inclusive: every citizen may attend the plenaries, which are announced through the neighbourhood associations and the media.

The primary aim of the Participative Budget was to address the political rights of those marginalised from decision-making. It sought to democratize public structures and procedures and it is claimed to have also resulted in an effective allocation of resources. The process has meant a total reversal of priorities in local government interventions and has given birth to a strong social agenda to prioritize the needs of the poor.

The strengthening of civil society organisations has also allowed for more citizen control over government action in a variety of areas – beyond investments – from public servant contracting to the quality and level of service provision. A "non-governmental public sphere" has been created through a political contract between community organisations, in particular, and the local government. In cities implementing LA21

without public involvement in budget decisions, Participative Budget could be a radical way of moving it forward.

Governing African urban futures⁷⁵

Even if the urban sustainability challenges are surprisingly similar all over the world, every city, country and continent has its own history that has a strong impact on the culture of governance and the relationship between individuals, families and the society. That is why only some principles can be transferred from place to place, but they'll have to be adapted carefully to the local context. In order to be able to do that, the characteristics of the place have to be analyzed and understood profoundly. Otherwise all the ideal models of transparent government and active public participation are useless.

Professor AbdouMaliq Simone has studied and written a lot about African society and cities. (Editor's note: This is an exceptionally long quote from a number of articles by him. I've not been able – or wanted – to summarize his rich message and wonderful language.) According to him, they are today “sites of intense contestation. Various forms of political turmoil and civil conflict are long familiar. But there is also contestation among different social groupings, ethnicities, elites and political formations that does not produce marked ruptures but instead a kind of continuous volatility. There is contestation in terms of the fundamental rights and obligations embedded in relationships between children and parents, between extended family members, between men and women, patrons and clients, citizens and government officials. Basic questions as to the place of self-initiative, individual decision-making and the conditions of belonging to family and other social groups are intensely debated. People are working out many different kinds of accommodation between the needs of autonomous individual action and the security of life that largely remains rooted in long-term forms of social belonging.”

“During the past decades notions of governance based on the self-initiative and responsibility of

individual citizens, the management of delivery systems through entrepreneurial organizations and practices, and the liberalization of regulation as applied to market transactions, far from dampening the expectations and demands of lower-income groups, has only intensified them. Levels of participation in some form of collective action have increased. While the particular forms of collectivity may not always be recognizable as a coherent social or political force, they are opportunities for participants to rehearse various practices of negotiation, collaborative exchange, and strategic planning.”

“Likewise, just because ‘governments’ are designated as such, with specific legal authority and status as sovereign powers, does not mean that they have similar ways of operating across different contexts. Nor are those differences simply differences in development stages or sequences that can be captured by auditing and accountability. Governments act differently in different places because they are situated in other relationships. Sometimes ties of common ethnicity will straddle national borders; sometimes governments will attempt to involve themselves across a wide variety of national localities or communities; at other times, government will only pay attention to specific groups or places. These relationships shape and curtail what they are able to do regardless of the prevailing juridical and political frameworks that recognize them as ‘governments.’”

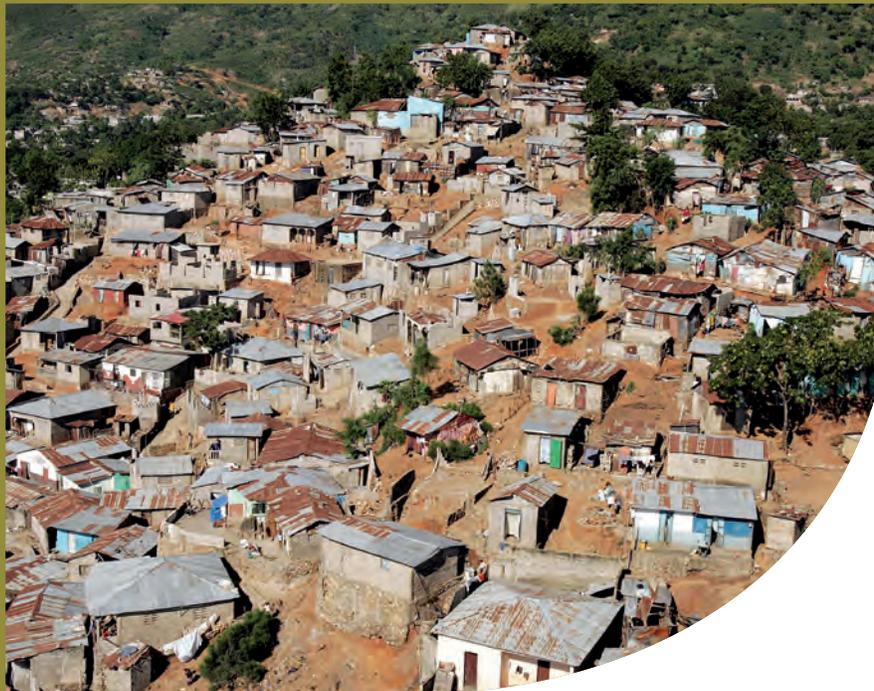
“As such, the greater visibility of demands for justice, democracy, efficiency, and morality that is taking place across African cities is a fruitful place to support a process where political contestation can be waged in terms of those who have been previously kept out of the process. But what the poor actually win in such a process largely depends on the existence of political parties and institutionalized policies that back-up claims for right. Here, the problem is that more powerful political forces can define the categories and identities through which these claims can be made. The growth of religious movements, both Christian and Muslim are having an important impact in reasserting practices of economic advancement outside of



patronage and communal systems. They also express commitments to the value of hard work, education and solidarity across ethnic and regional groupings. How far such religious movements can go in giving rise to a new generation of entrepreneurship is contingent upon the extent to which the elite succeed in capturing these movements for their own economic and political objectives and how much pastors and imams use these movements to become a new elite.”

“There are no clear cut ways out of these dilemmas. The effectiveness, for example, of local governments can depend upon the interactions of a wide variety of factors. Here, the residues of more authoritarian decision-making arrangements may remain important ingredients. Complete dependence upon various forms of local democracy sometimes can actually make decision-making, participation, and service provision more problematic. Sometimes granting institutional autonomy to health clinics, schools, and other service providers to constitute locally specific staff and operational procedures will effectively harmonize relationships between providers and clients.”

Recommendations: Ten steps on the way forward



It would be misleading to categorize conclusions or recommendations according to region or level of development. Cities in the North keep learning from cities in the South – Curitiba and Porto Alegre as prime examples. In most major cities, the developed and the developing world coexist in some form, creating the tensions of segregation and the challenge of inclusion. Inclusion is not a separate issue but an approach that has to be taken when decisions about governance, participation, public transport and urban infrastructure are prepared and made. One of the most decisive factors that puts cities in different categories is their ability to access financing, be it by collecting taxes and fees for service, getting a share of tax income from their national governments, or by being able to issue municipal bonds or get low-interest

loans on international money markets. That is where their attitude to traditional versus high technology or commercial versus non-market solutions becomes significant: are cities able to come up with innovative solutions that do not depend on the most expensive technology and maintenance requirements? The development of the Bus Rapid Transit (BRT) model in Curitiba, instead of a traditional subway system requiring heavy investments, is a prime example.

1. *Inclusive and locally rooted visions of 21st century cities for all*

There is no one top-down solution to urban sustainability but a wealth of bottom-up approaches instead. One of the strengths of cities in both poor and

wealthier countries is the initiative and inventiveness of their citizens. Seizing this opportunity requires critical rethinking, application of innovative non-market solutions and the active involvement of all those concerned.

One-way information does not fulfil the contemporary requirement for the quality standards of citizen involvement. People have to be given the possibility to become the key resource of cities. Citizens need a supporting 'infrastructure': places for people to meet and get organized, an attentive media to communicate their concerns, and tools, processes and channels to create initiatives and communicate. Some cities are fortunate to have visionary leaders for one or two electoral periods, while most cities cannot wait for enlightened leadership but have to establish permanent solutions of public participation.

Methods and processes exist already, very similar in developing and developed countries, and are ready to be applied: participatory budgeting, stakeholder forums, popular votes on urban issues, user co-creation of basic services, e-participation, or kiosks for basic services, information and internet access for example. The right to participate is not linked to the home address only, does not concern only geographical communities but also communities of old or young people, pedestrians or bus drivers, street vendors and restaurant owners.

The Rio+20 Urban Agenda will have to democratize sustainable development further. This can only happen at the local level. After the success of Local Agenda 21, at some point the sustainability agenda has been hijacked by civil servants as if it was only a matter of finding the most appropriate technical solutions, and cornered to the cities' environmental departments. The Next Urban Agenda has to be more inclusive, both in terms of participants and issues. Social and budgetary agendas have to be integral parts of it. Economic questions must not be left to economists only but the financial decisions have to fulfill sustainability criteria, too.

Cities all over the world need inclusive pro-poor strategies and guidelines enabling innovative local solutions. If the city is good for its weakest citizen – a child, an aged person, a new immigrant, a handicapped person, it is going to be good for everyone else, too. Integration and inclusion have to be on top of the urban sustainability agenda.

- Sustainable development has to be **democratized** at the local level in every country.
- Existing methods of citizen **participation**, such as participative budgeting, should be used in every city, selecting the locally most appropriate tools and most urgent issues.
- New methods of **inclusion** should be developed and disseminated among cities.

2. *Integrated planning of sustainable urban infrastructures*

An integrated approach is the only way to avoid decisions being prepared under wrong assumptions: the prevailing preference of an "economic" view has to be replaced by a sustainable one, which includes ecological and social considerations and mid- and long-term thinking. Only if potential impacts of decisions are broadly assessed, will the development of cities become sustainable step by step. To achieve this, both the administration and political decision making have to work across sectors. Free access to public data is an essential prerequisite for integrated planning, and not just data and access, but the possibility to look for specific information and trends.

In an ideal world urban planning starts at the regional and metropolitan scale and proceeds from larger scale down to neighborhood scale. No development, no construction, in particular no infrastructure investment should be permitted without adherence to approved larger scale plans. For the approval of planning documents, there has to be a transparent process, where the roles of different institutions, stakeholders, experts and decision makers are clearly defined.

- The use of **instruments for integrated urban planning and sustainability impact assessments (SIA)** should be mandatory at national and local levels.

3. **Decent urban mobility for everyone.**

Land use and mobility planning have to be so closely integrated that they become one. Awareness has to increase about the environmental and health impacts of emissions, noise and the space requirement for cars. Positive impacts of public transport, biking and walking must be brought to the public and decision makers.

- It should be mandatory for all municipalities to offer **public transport, biking lanes and safe pedestrian sidewalks** to their citizens.
- Urban development projects should be charged a transport levy which can finance **restricted parking** facilities and public transport.
- **Road safety** must become the priority for city leaders.

4. **Sustainable construction processes, buildings and maintenance**

It is important to renew the city with energy-efficient and more flexible buildings of long-term value and longevity. Functional flexibility leads to a longer life for buildings, because they can be adapted to changing needs. Technical systems and services that have a shorter life-cycle than the structure of the building have to be installed so that it is easy to renew them. This means applying technical aids sparingly, maintaining them and making the most of all passive means. Buildings should generate more energy than they consume, and collect and purify their own water.

Many cities have started with retrofitting their own public buildings with enormous success to serve as good examples within the city and outside. Experience in northern European markets indicates that low-income housing stock can be successfully retrofitted for profit, as well.

Monitoring tools are necessary to measure building performance and progress. Criteria are also needed as assessment tools in all procurement, investment and subsidy decisions. Some of the indicators can be used worldwide, but when the rating system is developed within a specific region, it can contain assumptions about appropriate performance benchmarks and the relative importance of issues such as selection of site, water and energy resources, risk of earthquakes or flooding, local climate, solar hours, cultural aspects, availability of materials, and so on.

- All buildings should produce their own **energy**.
- Local and national **governments will have to lead** in setting the benchmarks for new construction, maintenance and renovation of their own buildings.
- **Maintenance and renovation** of existing buildings should become a key business sector, where innovative solutions are incentivized.
- National research institutes should be commissioned to develop local building sustainability **assessment systems** in cooperation with local sector stakeholders. The criteria should cover e.g. environmental impacts, decent work and fair trade requirements, and anti-corruption measures.

5. **Energy security and empowerment through distributed renewable energy systems**

Using less energy through savings, i.e. decreasing consumption, by increasing energy efficiency with more sustainable procurement, buildings, infrastructure and service provision, and shifting energy production to renewable fuels are self-evident targets that a city has the possibilities to implement. The localized energy revolution requires also new patterns of distributed production and distribution.

Energy can be democratized. "In the new era, businesses, municipalities and homeowners become the producers as well as the consumers of their own energy ... We began to envision a world where

hundreds of millions of people are ‘empowered’, both literally and figuratively, with far reaching implications for social and political life... In the 21st century, individual access to energy also becomes a social and human right. Every human being should have the right and the opportunity to create their own energy locally and share it with others across regional, national and continental intergrids.”⁷⁶

- Energy production should be increasingly **decentralized** and based on **renewable** energy sources.
- National governments should enact legislation that provides fair subsidies to support the shift to renewable energy sources.
- Cities and metropolitan regions should establish energy information offices to give locally appropriate advice to both municipal departments, private companies and citizen.

6. Valuing local skills and non-market based solutions

Many technological innovations and modern solutions tend to be short-lived, difficult to maintain and repair, and costly. Cities and the built environment need solutions that have been adapted to local climate, materials and handicraft skills, maintenance capacities and culture. Heavy infrastructure and the latest technology is not necessarily the best solution.

- National and local standards for buildings and infrastructure should encourage and incentivize the development of **contemporary technological solutions that are based on traditional principles and local skills and materials.**

7. Measuring success and sharing data and knowledge

Everybody in the long chain from research and expertise to political decision-making, implementation and maintenance needs capacity building in one’s own language. Only reliable, comparable facts-based information is useful. Institutions and tools for data

collection and platforms to share it need to become stronger.

- National and international research institutes and their networks have to be commissioned to create **databases, benchmarks, a set of core criteria and targets**, as well as to monitor and report about progress to **national platforms of urban information** sharing that should be established in every country.

8. Appropriate mandates and financing at all levels of government

Governance for an urban culture of sustainability is not possible without local power to decide and financing to support it. Cities and metropolitan regions are two among “all levels of government”. Decentralization has to delegate appropriate mandates and secure financial resources to the relevant levels. About issues that cross city borders in an area, networked cities have to recentralize the decision making power to institutions of metropolitan governance.

The local level is the level closest to people, their needs and their knowledge. It is the level of implementation of sustainable development policies in the form of urban infrastructure, basic services and land use and mobility planning. Taxation, cross-subsidies and user fees at local, metropolitan and national level can support sustainable development and curb unsustainable consumption, if they are designed with these goals in mind.

- National governments should engage in a dialogue with local and regional government and agree on **mandates and financing** that are **appropriate** from the point of view of urban sustainability.

9. Cities proactive in a globalized world

Globalization and financialization have direct impacts at the local level. Changes in our urban landscape may be shaped more by global political and economic decisions than by the seemingly more visible results

of local urban planners. Among other things, cities will need a renewed portfolio of municipal “foreign affairs”, because the global level that sets the rules for everyone has until now been unduly inaccessible to local governments. Cities will also have to analyse more carefully, what are the characteristics and roles of the private and the public sector, and what are the conditions for cooperation and partnerships on an equal basis.

Cities join their forces both in order to get their voice heard, but also to disseminate best practices. **City networks** play an important role for **peer learning**, as information and good and bad experiences can be exchanged, and everyone does not have to re-invent the wheel. Joint preparation of projects or procedures is possible and even very small city departments can profit from the organizational, human resources and financial strength of bigger ones. Common action can be taken e.g. to achieve better results in climate protection, reduction of waste, sustainable procurement or new transport strategies, or to push necessary regional, national or international legislation.⁷⁷

- International organizations should take “**ambassadors**” of local governments to the negotiation tables as equal partners with national governments and private sector representatives. The global competition of cities, to the extent there needs to be one, should focus on **competing in sustainability**.

- Worldwide networks of cities should be enabled to involve all those cities that have no sustainability strategies, yet, in particular those with biggest estimated growth.

10. Towards a culture of sustainability

The cities that come up with interesting pilot projects don't do it by chance. In many cases they have a long history of trial and error behind them – think of Barcelona that has worked consistently since the 1970s. The profile of a city cannot be upheld with individual projects any more but every decision should be weighed on the scale of sustainability.

- Cities should be patient in developing a culture of sustainability and transformation, which is based on a continuous analysis of their local identity and history.

A postscript



Urban issues have risen high on many agendas that deal with global questions. Most of the world's resources are consumed in cities, where the majority of people live. It has become obvious that the value of a single "green" building or eco-labeled product is marginal if it is not supported by sustainable urban infrastructure and a culture of sustainability.

Cities compete with each other globally trying to please investors. There is hardly any municipality that does not in its official strategy claim that sustainability is one of its key targets. However, it is a totally different story if one asks, into what actions this declaration translates.

In all fairness, cities are at different stages in their development, and many of them in the global South have to struggle with enormous growth rates and immigration. Some urban areas in the North have opposite challenges of negative growth after old industries have died out or left to the South. Inequity and segregation seem to be common challenges to cities all over the world.

Urban inequity and segregation are also an indication of global inequity. While more and more cities want to focus on services and hi-tech, the dirty work of the world remains to be done in the poorest cities with the most meager resources to develop.

Yes, sustainability criteria may be used at the City Hall when envelopes are purchased – but what is the point if every other product and service is the outcome of an unsustainable process? Yes, there is a Dow Sustainability Index – but what use is it if not all companies, investments and financing support sustainability? Yes, there may be a solar panel here and there, but zero emissions mean nothing less than 100% renewable energy. Yes, there may be tree-lined roads but as long as the pedestrian is not the king of the street, the city is not sustainable!

The process towards sustainable cities starts with profound analyses of the past and present culture of the city. It builds on an inclusive and holistic vision, applies integrated planning and transparent governance, and monitors implementation rigorously. Even a huge amount of excellent but disconnected pieces does not make a well functioning whole. Because money is not going to stop talking, its language will have to become sustainability. A locally rooted, democratized culture of sustainability has to be the foundation of urban development.

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