UN-HABITAT

ICLEI Local Governments for Sustainability

Sustainable Urban Energy Planning

A handbook for cities and towns in developing countries

Printing: UNON, Publishing Services Section, Nairobi, ISO 14001:2004-certified.

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ABOUT ICLEI, UN-HABITAT AND UNEP

ICLEI – Local Governments for Sustainability

ICLEI – Local Governments for Sustainability is an international association of local governments and local government organisations that have made a commitment to sustainable development. Over 1000 cities, towns, counties and their associations worldwide comprise ICLEI's growing membership. ICLEI works with these and hundreds of other local governments through international performance-based, results-oriented campaigns and programmes to support local government in the implementation of sustainable development at the local level. In the climate and sustainable energy field, ICLEI runs one of the largest global climate change programmes for local governments, Cities for Climate Protection (CCP) Campaign, which aims to assist cities to adopt policies and implement quantifiable measures to reduce local greenhouse gas emissions, improve air quality and enhance urban livability and sustainability. ICLEI is also active in the field of adaptation through programmes focusing on the development of local capacity to identify and to reduce the vulnerabilities associated with climate change.

The **ICLEI Africa Secretariat** was the lead ICLEI partner in the development of this guidebook and is one of many ICLEI regional offices. The ICLEI African Secretariat works across the African Continent and collaborates closely with the global ICLEI network and other regional offices around the world, in sharing tools, materials and strategies and good practices specifically designed and implemented at the local level.

For more information, see: www.iclei.org

UN-HABITAT

UN-HABITAT's mission is to promote socially and environmentally sustainable urban development with the goal of providing adequate shelter for all. In the field of the urban environment, the Sustainable Urban Development Network (SUD-Net) is an innovative network of global partners promoting a multilateral and interdisciplinary approach to sustainable urban development. The United Nations Human Settlements Programme (UN-HABITAT) supports local and national governments through SUD-Net and its component, the Cities in Climate Change Initiative to address key urban environmental issues related to climate change.

For more information, see: www.unhabitat.org/sudnet

UNEP

UNEP - The United Nations Environment Programme is the voice of the environment within the United Nations system. In the field of urban environment, UNEP supports national and local governments to address key environmental issues with a focus that has both a local and an international dimension. In cooperation with partners, UNEP assists national and local governments by providing awareness - raising materials, organising workshops and trainings, developing tools and involving cities in international meetings. UNEP's Division for Technology, Industry and Economics (DTIE) encourages decision-makers in government, local authorities and industry to develop and implement policies, strategies and practices that are cleaner and safer, make efficient use of natural resources, reduce pollution and risks for humans and the environment. Energy, transport, building and construction, as well as urban issues at local level are some of the key areas DTIE deals with in the context of sustainable development.

For more information, see: www.unep.fr/en/

WHY THIS HANDBOOK WAS WRITTEN

The main purpose of this handbook is to assist people who are working in or with local government to develop ***sustainable energy and climate action plans and implementation programmes***. There can be no single recipe for all cities – so it is up to each local government to develop its own innovative and appropriate plans based on local resources and needs. We, at ICLEI and UN-HABITAT, hope this handbook will go a long way to helping you to do this and allow you to take full advantage of the opportunities inherent in such planning.

This handbook is for you if you are working in an urban context with or as part of a local government and if your primary areas of concern include:

- Delivery of services to citizens
- Economic development
- Strategic development planning
- Land use planning, zoning, building plans approval
- Housing and poverty issues
- Environmental management
- Management of local government resources and systems
- Fiscal responsibility and risk management
- Water resource and waste management
- Public health
- Transportation management

What you will find in this handbook

- The **Introduction** addresses the challenges of energy consumption, climate change and development in developing countries. It deals with the role of urban centres and local governments in defining a sustainable development path and a new energy future in their countries. It includes an explanation of the greenhouse effect and a mini-history on climate change.
- **Chapter 1** is an explanation of why it is important for urban centres in developing countries to engage in sustainable energy planning.
- **Chapter 2** provides in some detail a step-by-step process to developing and implementing a sustainable energy plan, illustrated by relevant case studies.
- **Chapter 3** offers a range of case studies from developed and developing urban centres covering all the major areas of local government responsibility.
- **Chapter 4** provides an extensive list and information on support organisations and resources.

Acknowledgements

In addition to the hard work of ICLEI Africa, UN-HABITAT and UNEP, the following authors are acknowledged:

Sarah Ward has worked for many years in urban planning, housing and energy in South Africa. She was a founder member and director of Sustainable Energy Africa (SEA) from where she managed the Sustainable Energy for Environment and Development (SEED) Programme, working with South African cities. She now heads the Energy and Climate Change Branch of the City of Cape Town and has authored a number of books on sustainable urban energy planning.

Leila Mohammed trained in environment, development and energy studies and has over 10 years experience in sustainable energy and climate change policy and practice at local government level. From 2004 to the end of 2007 she was a director of Sustainable Energy Africa. She was a member of the Long Term Mitigation Scenarios Think Tank on climate change for the South African government and now works on developing renewable energy facilities in South Africa.

The authors are indebted to the work of SEA and the SEED Programme for experience gained since 1998 in developing sustainable energy programmes with South African cities. The process outlined in Chapter 3 is based on a seminal manual produced by the Urban Consortium Energy Task Force in 1992, "Sustainable Energy: A Local Government Planning Guide for a Sustainable Future". This process, adapted for the South African context, resulted in a local energy planning guide "Energising South African Cities and Towns", 2003 (Ward S and Mahomed L), and was further adapted for "The New Energy Book", 2008 (Ward S). For this handbook, the process was made widely applicable for the developing world.

The web has proved an excellent resource for case studies and we thank all those who make their remarkable work available there.

Acronyms

CACP	Clean Air and Climate Protection (ICLEI software)
CCP	Cities for Climate Protection, a programme of ICLEI - Local Governments for Sustainability
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_2e	Equivalent carbon dioxide
ESCO	Energy Services Company
GHG*	Greenhouse gas
GWh	Gigawatt hour
ICLEI	Local Governments for Sustainability (previously International Council for Local Environmental Initiatives)
ITDG	Intermediate Technology Development Group (recently renamed Practical Action)
kV	Kilovolts
kW	Kilowatt
kWh	Kilowatt hour
LED	Light emitting diode
MW	Megawatt
NGO	Non-governmental organisation
R&D	Research and development
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UN-HABITAT	United Nations Human Settlements Programme
USAID	United States Agency for International Development

* **Greenhouse gases** are the gases present in the atmosphere which reduce the loss of heat into space and therefore contribute to global temperatures through the greenhouse effect. Greenhouse gases are essential to maintaining the temperature of the Earth; without them the planet would be so cold it would be uninhabitable.

kWh	= kilowatt-hour
GWh	= gigawatt-hour (1,000,000 kWh = 1 GWh)
1 GWh	= 3600 Gigajoules (GJ)
1 kg coal	= 1.89 kWh
1 kWh	= 0.963 kg CO_2
1 kWh	= 1.26 litres of water used

A kilowatt-hour (kWh) is one unit of electricity; one 60 Watt lightbulb burned for one hour will use 0.06 kWh

(60 Watts) x (1 kilowatt/1000 Watts) x 1 hour) = 0.06 kWh

INTRODUCTION

Urban centres, energy and climate change in developing countries

"The climatic world is one world even if politically we are not" R.Bryson

What is the future for energy and development?

The global energy crisis coupled with the threats of climate change bring into sharp focus both opportunities and challenges for developing countries. Developing countries have to address the increasing energy demands of growing economies, as well as address energy poverty issues often highlighted by extreme disparities in income. They also need to deal with the real and potential impacts of climate change. In addition to these challenges is the global imperative to reduce carbon emissions in order to prevent climate change. While developing nations have thus far been sheltered from obligations to reduce carbon emissions, we cannot anticipate that this situation will continue. Within this context developing nations need to follow a very different development path from that established by first world countries. This development path is a low energy, low carbon and generally a resource efficient one.

Economies across the world need to change the assumptions of this paradigm in order to build a sustainable reality. As financial and environmental impacts soar, the real costs of resource inputs and of waste generation need to increasingly be taken into account. These factors are making efficiency, conservation, reuse, recycling and renewable energy sources primary considerations for a healthy economy.

In an attempt to reduce resource inputs and environmental impacts, some developed nations have managed to 'decouple' economic growth from energy consumption – essentially resulting in energy inputs that decrease with economic growth. This has been achieved through technology and behaviour change to improve efficiency and by closing the energy loop in production (e.g. recapturing heat energy released in the production process to then power production). Energy-poor countries, such as Japan, have been very successful at achieving this. Implementation of high energy-efficiency and the use of renewable resources are also evident in energy-poor developing countries such as the island states of Reunion and Mauritius. As such, under conditions of necessity, pursuing efficient and renewable energy paths is possible.

There is potential to greatly improve energy efficiencies and reduce carbon emissions in many upper-middle income developing countries which have a substantial industrial base. For example, South Africa produces a mere US$1.06 in economic value for every 1 kWh of electricity consumed whereas Brazil manages twice and Mexico four times this level of energy efficiency.[1]

What is happening in our cities?

Over the last 20 years, urban centres have experienced dramatic growth. Today half of the world's total population (around three billion people) live in urban settlements. Developing countries in particular are undergoing rapid change from rural to urban-based economies as they are transformed by their urbanising populations.

"The overriding concern of developing countries is economic growth and poverty eradication and you cannot expect developing countries to engage on the question of climate change and harm those overriding objectives."

Yvo de Boer, Executive Secretary of UNFCCC, April 2008

There are marked differences in the level and pace of urbanisation within less developed regions of the world. Latin America and the Caribbean are highly urbanised, with 78% of their populations living in cities in 2007. Asia and Africa are less urbanised, both with around 40% of their populations living in urban areas. While currently less urbanised, Africa and Asia are experiencing rapid rates of urbanisation. Consequently by 2050, about 62% of their inhabitants will live in urban areas. At that time, 89% of the population of Latin America and the Caribbean will be urban.[2]

In addition, over the next 30 years population growth will be nearly entirely concentrated in urban areas in the developing world. Much of the current debate regarding sustainable cities focuses on the formidable problems for the world's largest urban agglomerations. However, smaller urban settlements are also growing rapidly and the majority of all urban dwellers reside in such smaller urban centres.

[1] How efficiently does South Africa use electricity? Kevin Lings, Chief Economist, STANLIB Asset Management 26 Feb 2008. The countries chosen all fall into the upper-middle income group, have reasonably reliable economic data especially electricity usage data, have a similar size of industry.

[2] World Urbanization Prospects: The 2007 Revision prepared by the United Nations Population Division, www.un.org

Cities, energy and climate change

While cities command an increasingly dominant role in the global economy as centres of both production and consumption, this rapid urban growth throughout the developing world is outstripping the capacity of most cities and urban centres to provide adequate services for their citizens.[3]

While there is no 'typical' city in terms of their energy needs and energy use, they do have a lot in common. Cities run on energy and require land – their burning of fossil fuels and their contribution to land clearing combine to contribute massively to the concentration of greenhouse gases in the atmosphere. They are also extremely vulnerable to energy scarcity, to energy price rises and health impacts of very poor air quality. In developing countries many urban citizens experience extreme energy poverty and their access to transport and so to urban goods is constrained.

There is no doubt that it will be far less costly to avoid the outcomes of climate change, than to live with its consequences or to repair its damage.

While the energy transition challenges faced by developed and developing urban centres are fundamentally the same – to stabilise a growing hunger for secure energy supplies, avoid polluting and wasteful industries and power systems and shun development paths that condemn citizens to high transport costs – urban centres in developing countries face additional challenges. These can include serious finance, governance, capacity and resource problems – and yet the fluidity of development and the rapid changes that are occurring may make opportunities of some of these challenges.

These cities, while they may have fewer resources than those in developed countries, are not so 'set in their ways' – they have the potential to establish new and different development paths.

Some of the advantages of sustainable energy action planning:

- **Improvements in local air quality**
  Energy management initiatives are among the most cost-effective actions that local authorities can take to reduce the air pollution that causes serious environmental and health problems within their cities.
- **Financial savings**
  While many local authorities are faced with budget deficits, the appeal of saving money is often the starting point for municipal energy management initiatives. Improved efficiencies in municipal energy consumption offer plentiful opportunities for reducing operating costs.
- **New jobs**
  Inefficient energy systems represent important investment opportunities in the community and such investments are among the most effective ways to create new employment. When energy management reduces expenditures on fuel and electricity, the savings can then be re-spent within the community.
- **Local economic development**
  The energy management industry itself is a growth industry and its promotion can be an effective component of local economic development strategies in the community. In addition, big business is increasingly considering the livability of a city an important factor in deciding where to locate – access to urban goods and transport efficiencies (and so spatial development and public transport provision) are critical to creating livable cities.
- **New partnerships**
  Utilities, private enterprises, financial institutions and levels of government other than municipal are all pursuing energy management for various reasons. They have recognised that urban governments are well suited to deliver the type of integrated programmes often required to achieve energy-efficiency and renewable energy objectives.

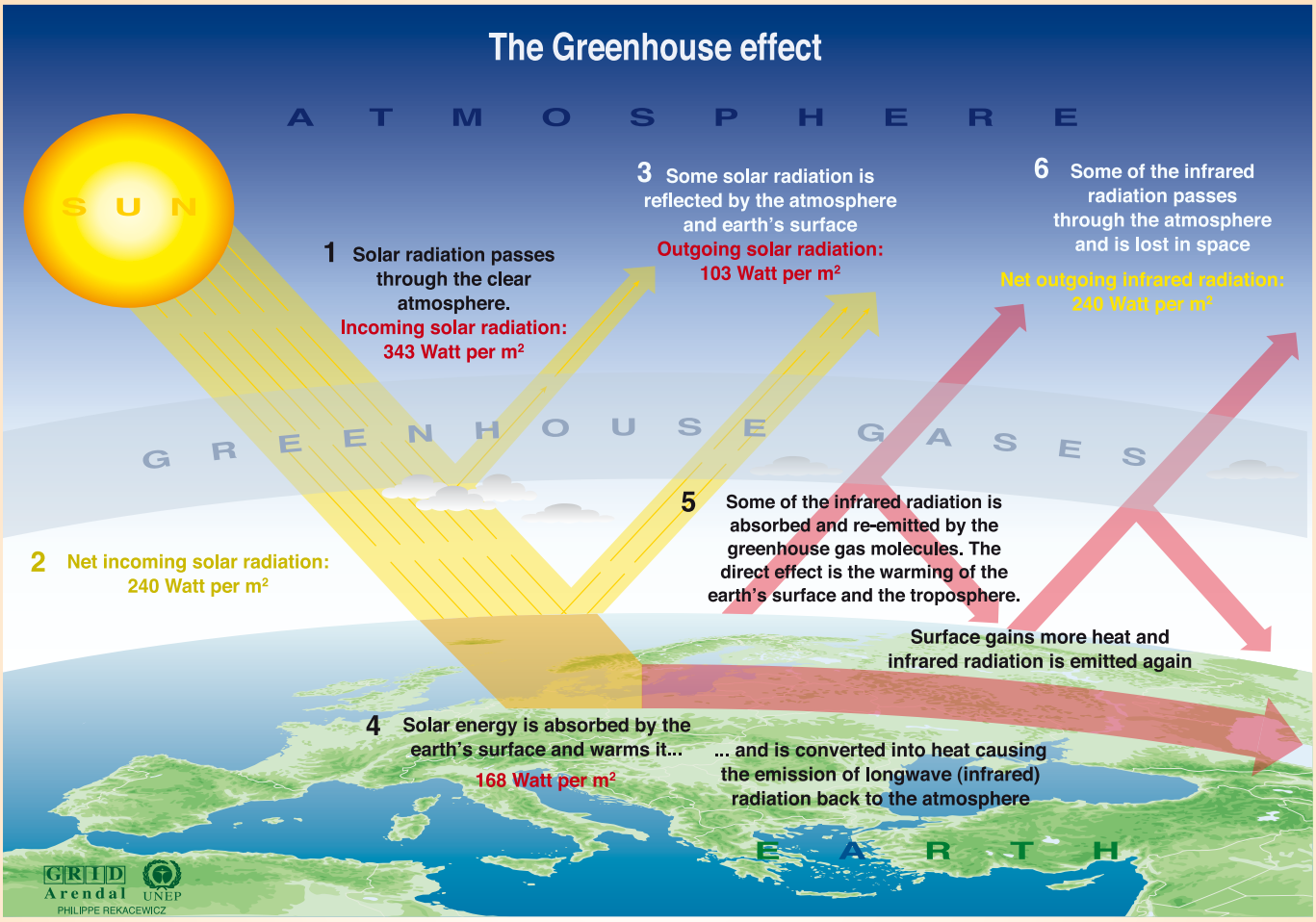
Leapfrogging

One of the more obvious opportunities for cities in developing countries is that of 'leapfrogging' – where countries skip inferior, less efficient, more expensive or more polluting technologies and industries and move directly to more advanced ones. In terms of energy planning, developing countries need not repeat the mistakes of highly industrialised countries in creating an energy infrastructure based on fossil fuels, but 'jump' directly to renewable energy sources and more efficient technologies.

[3] Cohen, B. 2006

What is climate change and what does it mean for the planet?

The Greenhouse Effect



Okanagan University College in Canada, Department of Geography, University of Oxford, School of Geography and the United States Environmental Protection Agency. 1996. *Climate Change 1995: The Science of Climate Change*. A Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press: Cambridge.

People and the climate

Humanity is changing the climate of the earth. As a global average, surface temperatures have increased by about 0.74°C over the past hundred years. Since record keeping began in 1880, the five warmest years on record have occurred since 1997 (IPCC, 2007).

In 2005, atmospheric levels of CO_2 were 379 parts per million (ppm) – this is a 20% increase in levels since measurements began in 1959. In 2006, global carbon dioxide output approached a staggering 32 billion tonnes, with about 25% coming from the United States and 20% from China.

Projections of further temperature increases in the 21st century vary considerably, between a minimum of 1.4°C and a maximum of 5.8°C depending on the level of stabilisation of carbon emissions, the pace of de-carbonisation of the global economy and the patterns of demographic and economic development. Even if the global mean temperature only increases by 1.4°C, this will be a greater rise than over the last 1,000 years where global temperature variability has remained below 0.5°C.

Already there is much evidence of the impact of climate change, with glaciers melting, sea ice disappearing, deserts advancing, wildfires stripping vast areas and more extreme climate events. Radical action is required to reduce carbon emissions into the atmosphere and therfore keep climate change within a range to which nature can adapt.

UN talks by Oxfam International/flickr.com

Climate change: A timeline

1827: French scientist Jean-Baptiste Fourier is the first to consider the 'greenhouse effect,' the phenomenon whereby atmospheric gases trap solar energy, increasing the Earth's surface temperature.

1896: Swedish chemist Svante Arrhenius blames the burning of fossil fuels (oil, gas and coal) for producing carbon dioxide (CO_2), the most polluting of the greenhouse gases now blamed for climate change.

1950s onwards: Global warming science begins and grows with increasing information on the impact of greenhouse gases on climate; development and growth of environmental movements.

1979: World Climate Research Programme is launched to coordinate international research.

1988: The United Nations sets up a scientific authority to vet the evidence on global warming, the Intergovernmental Panel on Climate Change (IPCC).

1990: First IPCC report says levels of man-made greenhouse gases are increasing in the atmosphere and predicts these will cause global warming.

1992: Creation of the United Nations Framework Convention on Climate Change (UNFCCC) at the Rio Summit. The UNFCCC in 2008 had 192 member countries.

1997: UNFCCC members sign the Kyoto Protocol. Under its first phase, industrialised countries must cut emissions of six greenhouse gases so they are 5.2% lower than 1990 levels by the end of 2012.

2001: The United States abandons the Kyoto Protocol, with President George W. Bush calling the treaty too expensive for the US and unfair as developing countries escape binding emissions cuts. Kyoto signatories, minus the US agree on the treaty's rulebook, opening the way to a ratification process.

2005: Kyoto Protocol takes effect on 16 February.

2007: Landmark report by the IPCC delivers blow to climate sceptics. It says the evidence for global warming is 'unequivocal' and forecasts warming of 1.8-4.0°C by 2100 and a rise in sea levels. Nobel Peace Prize awarded to IPCC and former US vice president Al Gore, whose documentary 'An Inconvenient Truth' raises climate change awareness. UNFCCC members including the US agree after marathon talks in Bali, Indonesia to launch negotiations on a new treaty to replace Kyoto, which expires in late 2012.

2008: Negotiators from up to 180 countries meet in Bangkok from 31 March - 4 April for the first round of negotiations that should pave the way for a new international treaty in 2012 to take over from the Kyoto Protocol. Outcome termed 'The Bali Road Map'.

2009: The 15th United Nations Conference of the Parties (COP 15) climate change conference was held in the Danish Capital, Copenhagen in December. A major focus of this meeting was the role of local government. ICLEI assisted local governments around the world to prepare for this meeting.

CHAPTER 1

Why is sustainable energy planning important for your city?

The energy sector and carbon mitigation have to be at the centre of any sustainable development strategy.

"Although it was national governments that signed the Climate Change Convention, the real global leadership for reducing carbon emissions and energy conservation is coming from municipal leaders."

Dr Noel Brown, former Director of the North American region at UNEP.

The use of energy, the types of energy used and the lack of access to sufficient energy have far reaching implications for a city's economic development, its environmental health and for the poor. The burning of fossil fuels to provide energy is the major contributor to excess carbon in the atmosphere which is the cause of global warming. Cities which implement sustainable energy and climate action plans reduce their vulnerability to energy scarcity and to energy price rises, they have less traffic congestion and lower energy input costs, they have cleaner air and their low-carbon economies can afford them a competitive economic edge globally. And, specifically for cities in developing countries, a sustainable energy and climate action plan should consider the users' needs first – this means that poorer households and small energy users should be prioritised.

"The global effort for sustainability will be won or lost in the world's cities where urban design may influence over 70% of people's ecological footprint."

Wackernagel 2006

Local governments, energy and climate change

As local governments manage or oversee all city activities and city development, they should play a central role in determining the energy and carbon emissions picture of their cities. They also have direct access to their citizens and are best placed to know their needs and to influence their behaviour. Every city is different – it has different resources at its disposal, different needs, different development paths and different mandates and powers. A city's energy plan must be built on its particular needs and the resources at its disposal.

Local governments can make significant energy savings in their own operations, thereby saving money, setting a good example and even testing new technologies.

These are some of the ways in which local governments play a central role in the energy picture of their cities:

- They plan and manage city development and growth
- They establish and enforce building codes and approve building plans
- They are the primary providers of basic services such as water, waste management, street lighting and other related services
- They are responsible for transport planning and management across and within a city
- They are usually responsible for the distribution of electricity and for billing and may be responsible for some generation capacity
- They are big energy users themselves – in their fleets and buildings
- As they are major employers, they can directly influence their employees energy-use patterns
- They are engaged in significant procurement – of paper, fuel, building materials, light bulbs, vehicles etc.

The sustainable energy path for cities

- Reduce carbon emissions
- Reduce dependence on fossil fuels
- Introduce cleaner fuels
- Increase use of renewable energy
- Promote diversification of energy sources
- Support local and decentralised power supply
- Focus on energy efficiency and provide support and information to users
- Make efficient resource use the basis of economic development
- Ensure that citizens have appropriate access to energy services and information on best energy use practises to reduce poverty
- Plan for efficient spatial development
- Develop efficient and accessible public transport using cleaner fuels
- Communicate! Create a sustainable and low-carbon energy vision for the future.

Sustainable energy action planning

The aims of sustainable energy action planning are optimal energy-efficiency, low- or no-carbon energy supply and accessible, equitable and good energy service provision to users. Planning is based on consideration of the broader concerns of the whole economy, environment (particularly carbon mitigation) and society, not just a 'least financial cost' focus. And, it is led by the demand for energy services.

These are the key characteristics of sustainable energy and climate action planning:

- all energy sources and energy-related activities are considered as a whole system
- carbon mitigation is a key determinant in the development of the plan and choice of project options
- the demand for energy services, rather than what energy can be supplied, is the basis for planning
- energy conservation, energy efficiency and demand-side management are considered prior to supply-side solutions
- environmental and social costs are clearly considered
- energy sector linkages with the economy are included
- the plan is flexible and can anticipate and respond to change

Establish a vision

It is important to create a vision for a sustainable energy and climate action future and establish measurable goals according to this vision. This vision needs to be well communicated and loudly debated in the public realm. A clear vision backed up by implementation plans will empower and motivate city employees, citizens, business and industry. It also provides a benchmark against which progress can be measured.

Key elements of a sustainable system

- **Consistent:** the short-term actions are compatible with long-term goals and the viability of the system
- **Renewable:** the system depends on renewable resources and operates using environmentally-benign technologies
- **Diverse:** the more diverse a system is, the more able it is to adapt to needed change
- **Inclusive:** all elements of the system are valued and used for the good of both the individual parts and the whole
- **Interdependent:** each element of the system is both dependent on and depended on by several other elements; the greater the interconnection, the stronger the system.

Kuyasa CDM Project, South Africa by Bruce Sutherland, City of Cape Town

Why a demand-led approach to energy planning is important:

Understanding the needs of the users

Good energy planning needs to be informed by the right kind of information. It is fairly easy to gather supply information (how much oil, electricity, gas etc. the city uses), but it is more difficult to gather information on who uses what energy sources, how they use these and why. This kind of energy information is very important for sustainable energy planning, because your focus needs to be on meeting energy users' needs in the best way possible. There are very significant economic, social and environmental benefits which can be gained by planning according to people and industry needs: these therefore must determine a city or town's energy plan.

The needs of energy supply industries and the energy sources which they supply often dominate energy planning. The supply industries are also often very powerful so they can push their needs over the needs of users. Sustainable energy and climate action planning requires a very different approach: first of all it must put the energy service needs (such as the need for a warm or a cool house, hot water, cooked food, transportation of goods, welding, public lighting etc.) of the users and the city first. This is because energy service needs do not necessarily need to be met with a supply of energy.

Take for instance the need for a warm house in winter or a cool house in summer – this can be met by installing a ceiling and insulation or by overall energy-efficient design for new build; the need for hot water can be met by installing solar water heaters. A supply-led regime would just assume that the household could use electricity for heating or make some other plan from the energy sources available. A demand-led approach would also plan at a much more local scale and try to create closed/no waste systems. For example the energy input required by an industry for production may be able to be supplied by the waste energy and waste products produced by that same industry or by an adjacent industry.

A good demand-side database is important in order to develop energy action strategies and evaluate implementation.

Deficiencies of a supply-led approach	Benefits of a demand-led approach
• A disproportionate focus on the needs of the supply industry leading to inadequate consideration of the needs of the consumers	• Consumer needs lead the way so supply is planned to fit needs.
• A focus on income from the sale of energy sources and so a resistance to energy efficiency or fuel-switching measures.	• Energy efficiency and appropriate means to meeting energy service needs (cooking, warm house etc.) become all important.
• Potential for misjudging the future demand on energy supply	• Energy demand changes are tracked and can be anticipated timeously.
• A poor understanding of suppressed demand – for example households may be able to afford solar water heaters if proper financing were available: a supply-side focus would miss such opportunities.	• As the focus is on a range of ways of meeting energy service needs, a wider range of users can satisfy their energy service needs
• Little attention given to the management of demand (including behaviour change).	• Attention is focused on managing demand and demand-side management is considered prior to supply side solutions.
• The majority of users have no voice in the system.	• There is constant interaction with users and users are empowered to make energy decisions and choices
• The emphasis on supply makes the system vulnerable to energy scarcity and to escalating energy costs. In addition, users have little control over their energy expenditure.	• The emphasis on diversity of means of meeting energy service needs and on efficiency means that the system is more flexible and robust. Energy users have much greater control over their energy expenditure.

CHAPTER 2
Developing a Sustainable Energy Plan for your city or town

The planning process

This planning guide uses a 10-step process as a framework for local action. This is of course not a linear process (see diagram to the right for a more dynamic view of the process.) Remember that Step 6 and Step 10 (which have to do with public participation, building support and publicity) are ongoing throughout the process. The rest of this chapter takes you through each of these steps in more detail.

1. Designate a lead office and find a champion
2. Establish partnerships
3. Find the 'hooks' in the vision, goals, policies of your city
4. Conduct an energy and greenhouse gas (GHG) emissions audit of your city / local authority
5. Analyse your information and develop a draft plan
6. Build public and internal support
7. Finalise the plan
8. Implement and finance the plan
9. Monitor and evaluate the plan
10. Publicise and communicate the benefits

A journey of a thousand miles begins with a single step

Your local authority may be very new to the field of sustainable energy and climate action planning and it may seem to have little capacity to take meaningful action. Don't be disheartened – start with small steps. There is a saying that those who do things will make mistakes, but they never make the biggest mistake of all – doing nothing.

Environmental planning and management (EPM) approach

The environmental planning and management (EPM) approach of the Sustainable Cities Programme (SCP) addresses the urban challenge by promoting the sustainability of cities. The EPM approach is based on and supports the efforts that cities make in developing their environments by improving their environmental information and expertise, their strategies and decision-making, and their implementation of strategies. Each city-level project is adapted to the particular needs, priorities and circumstances of that city,nonetheless, all projects follow the same general approach and all are implemented through the same series of activities. The SCP Source Book Series provides detailed operational guidance. The volumes include the following:

Volume 1: Preparing the SCP Environmental Profile

Volume 2: Organising, Conducting and Reporting a SCP City Consultation

Volume 3: Establishing and Supporting the Working Group Process

Volume 4: Formulating Issue-Specific Strategies and Action Plans

Volume 5: Institutionalising the EPM Process.

The emphasis in this series is on relevance and realism. These volumes are the product of field-level experience gained over the past years in SCP city projects around the world. Precisely because it is drawn from the lessons of experience in so many different cities, the information contained in these volumes is not city-specific but can readily be adapted and applied to the tasks of urban environmental planning and management (EPM) in virtually any city context. The source book can be downloaded at: www.unhabitat.org/scp.

Another methodology for environmental assessments is to develop a Global Environment Outlook (GEO) for your city. This GEO Cities initiative was launched by UNEP in 2000. It extends the GEO assessment and reporting process to the urban level. The objective of GEO Cities is to build capacity on the preparation of integrated assessments on the state of the urban environment including linkages between environmental conditions and human activities. Based on this assessment the most critical environmental problems are identified to make it possible to formulate and implement urban strategies and plans to help cities improve urban environmental management.

UNEP and UN-HABITAT have been supporting GEO Cities in several cities of Latin America and the Caribbean and in three cities in Africa. After the success of GEO Cities, GEO seeks to implement a similar process at the local level in other regions: cities of countries in transition in Eastern Europe, the Caucasus and Central Asia region have a particular need for environmental monitoring and improvement.

The GEO Cities planning document can be downloaded from: www.pnuma.org/deat1/metodologias.htm.

City energy plan process

Steps to a Sustainable Energy Plan for your city

1 Designate a lead office and find a champion
Get every city department involved, but there must be a lead – can be in the form of a city-energy partnership

2 Establish partnerships
NGOs, business, utilities – look to energy efficiency and climate change programmes

3 Find the links in the vision, goals, policies of your city
Review vision, goals, policies and projects of your city and country; understand global imperatives

4 Conduct an energy audit of your city

Energy demand	Energy supply
Residential	All energy sources
Industry and commerce	Solid waste
Local Authority	Sewerage
Transport	Projections

Use patterns, cost, sources, emissions

5 Analyse your information and develop a draft plan
Rank issues according to city priorities, rank options according to greatest benefit; use scenario planning or a straw dog to develop draft plan

6 Build public and internal support
Use every opportunity to build capacity and build support; identify key stakeholders, work with officials and with the public.

7 Finalise the plan
Confirm vision, goals, targets, measures, projects – prioritise projects

8 Implement projects
Avoid short-term thinking; look for greatest impact; locate financial resources: from energy savings, CDM, energy taxes, grants, loans, performance contracts

9 Review and evaluate the plan
Monitoring>evaluation>response: make sure you build this into your planning from the beginning

10 Publicise the benefits
Use projects, use the media, energise the city's citizens

Publicise the benefits • Build capacity

Build support – your participation process

Step 1. Designating a lead office, finding champions

Climate change and energy affects every city department and it is therefore vital to build support among staff across all the city's responsibilities. The involvement of every city department will optimise the potential for successful planning and implementation at local level. Leadership and direction need to come from one primary office (or department). Be strategic about selecting your lead office: look at where you are likely to get most support, which office has the ear of council and which office has the strength and motivation to do the work – it could be the office of the Mayor, a strategic planning section, the planning department, the environmental department or even the electricity department (although these are usually too narrow in their focus to lead the way at this stage).

'Champions' – people with charisma, commitment and power – will play a vital role in capturing people's imagination and obtaining buy-in. It is important to find both political and staff champions. The political champions need to build political will and lead the councillors, the staff champions are vital for bringing the departments on board and for building the sustainability of the programme beyond the electoral terms of councillors. These people will have to lead and convince their community, their electorate and their peers to change the way they think about things, to change from a business-as-usual approach and to embrace a new, innovative way of thinking about issues and finding brave new solutions. You may need a champion for each key sector (residential, transport, electricity, commerce etc.). A sector can also be led by a suitable external organisation as well.

A steering committee or task team that brings all the necessary players together will help build commitment and keep everyone on the same page. This team or committee should be made up of staff (in decision-making positions), political champions and relevant local government stakeholders who will be able to support and drive the process. This committee should ensure that a common vision and clear goals are agreed on, while allowing a flexible platform for diverse groupings to unite and combine forces.

Case Study 1

Capetown by cyberdees/flickr.com

A pioneering municipal official: Osman Asmal

South Africa, Cape Town

In 1995, Osman Asmal joined the Environmental Planning Management team of the City of Cape Town, the department he now directs. Here he was responsible for coordinating the Local Agenda 21 initiative – a cities programme arising out of the Rio Summit and focusing on local level sustainable development. In 1998, under his leadership, the City of Cape Town (then Tygerburg Municipality) joined Sustainable Energy for Environment & Development (SEED), a programme being run by an NGO, Sustainable Energy Africa. The aim of the SEED programme was to build capacity to do sustainable energy work in the municipalities and in related NGOs. Through his enthusiasm and leadership, Osman enabled the City of Cape Town to become the first city in South Africa to develop an Energy and Climate Change Strategy in 2003, based on a thorough energy audit. Under his leadership the Environment Department was restructured to include energy and climate change posts – another first in South Africa.

In 2004, Osman transferred to another municipality (Ekurhuleni near Johannesburg) where he again led the local government to develop its Energy and Climate Change Strategy.

Source: State of Energy in South African Cities. Sustainable Energy Africa. 2006

www.sustainable.org.za

Step 2. Establishing partnerships

Partnerships bring expertise, resources, support and information to your process. As energy and climate change impacts cut across all sectors, we need a partnership approach if we are serious in addressing these challenges head-on. Ask yourself what NGOs, community groups, businesses, utilities, associations, funders and government bodies can support your planning and implementation efforts? Which groups can help build your in-house capacity and provide additional expertise? National and international energy and climate change programmes can provide valuable support and so can other cities which already have sustainable energy and climate action plans in place (see page 19 for support programmes internationally).

Questions to ask as you get started:

- What city department should lead your planning activities?
- Who should champion the process?
- Should a city council resolution be passed to kick off planning activities?
- What city departments might be the most active participants in the process?
- Who will you approach to be your planning and implementation partners?
- What can you do from the beginning that will help your plan turn into action?

Case Study 2

Solar Powered boat by redjar/flickr.com

An external partnership: The London Energy Partnership

London, England

The London Energy Partnership (LEP) was established as an independent body to provide coordination and synergy between the many groups, organisations and networks working on energy issues in London. It provides a vehicle for the delivery of the City's energy policy. Until the formation of the Partnership, London lacked an adequate mechanism to enable broad collaboration that is required to tackle these crosscutting issues.

Through a consensual process with energy stakeholders, the LEP guided the development of the City's 2004 Energy Strategy. In 2007, the City developed a Climate Change Action Plan to further strengthen action in this area. The Plan aims to achieve a 60% cut in CO_2 emissions by 2025. The LEP is responsible for implementing and reviewing the City's Energy Strategy and Action Plan.

LEP activities are directed by the LEP Steering Group. Task groups are responsible for driving the implementation of the Energy Action Plan. The London Energy Forum is a broader grouping of stakeholders which function as a networking and discussion forum and feeds into the LEP.

The main aims of the partnership are to:

- Assist in the delivery of London's CO_2 reduction, fuel poverty and security of supply targets for 2010, 2016 and 2050.
- Provide a single voice for sustainable energy in London and achieve a shift in thinking about sustainable energy by key stakeholders.
- Enable a number of high-profile, London-wide initiatives that deliver social, environmental and economic benefits.
- Create commercial opportunities in sustainable energy and help to build London's green economy.

www.lep.org.uk/about-us.htm and www.london.gov.uk/mayor/environment/energy/

Case Study 3

An internal partnership: sustainable energy for Tshwane

Tshwane, South Africa

Sustainable Energy for Tshwane (SET) is an interdepartmental committee coordinating energy and climate change initiatives within the Tshwane municipality. It is led by the Social Development Department's Environmental Health Unit. Other participating units included Energy and Electricity (newly named to include all energy sources), Transport, Environmental Resource Management, Housing, Local Economic Development, Integrated Development Planning, Spatial Planning, Waste Management and Water and Sanitation.

This committee was made possible through top-level direction from both councillors and senior managers. Through support from Sustainable Energy Africa (SEA), a local NGO, the municipality became part of the Sustainable Energy for Environment & Development (SEED) programme which focuses on building capacity in municipalities around energy issues.

Initially the committee experienced some challenges. The Social Development Department was frustrated by the lack of commitment within the committee, some departments did not incorporate SET into their own lines of decision making and the relevance of the energy issues was not always immediately apparent to departments such as the Housing Department.

These barriers were overcome through good communication and championship. Once the concern over the lack of cooperation was raised, leaders from the different departments clarified relationships between the departments and the committee. Strategic workshops have kept the concept of integrated sustainable energy planning and practice in the foreground and built cooperation between the staff on the ground, top-level management and political leaders.

In 2005, the SET committee initiated a project to supply 500 households with gas cookers and 30-kg gas cylinders. This means that poor people who are not connected to grid electricity are also able to access their free basic energy quota of the equivalent of 50 kWh per month.

Source: State of Energy in South African Cities. Sustainable Energy Africa. 2006

www.sustainable.org.za/seed/urban-sustainable-energy-for-environment-development-programme.html

Step 3. Finding the hooks

In addition to linking into national and international objectives, conventions and laws, the sustainable energy and climate action plan must be clearly linked to your city's core goals and action plans. This ensures that the city's energy and climate action strategy is regarded as core city business and will ensure relevance, buy-in and allocation of resources. Most of the city's goals and issues will have an energy component as energy is key to the delivery of all basic services. Find the 'hooks' or links and make them clear. You need to work across all your city's long-term and short-term plans and strategies: from economic development to environmental management, from land use planning to waste management, from housing to poverty alleviation and health programmes.

For example:

City goal	Hook
Poverty alleviation and adequate housing goals	Energy-efficient housing can contribute towards these goals by improving the quality of the housing and reducing costs to the residents.
Economic development	Improving energy security (ensuring that there is an adequate and consistent supply of energy to meet your city's needs) by supporting local independent power producers and energy business development (such as the solar water heater industry) will contribute to this objective.
Access to work and urban facilities	Improving access by better public transport systems will contribute to this.
Financial sustainability	Saving energy in municipal activities will provide significant cost savings in the short and long term.
Clean air	All strategies which reduce the burning of fuels will contribute to this.

Look out for these types of connections. Every sustainable energy and climate action strategy can help meet at least one or two other goals for your city. It is a good idea to dovetail with other programmes and projects. Be strategic and choose activities and programmes that are strong and well-placed, with enough actual or potential resources, community buy-in and political will behind them.

Identifying issues

You will be able to start identifying energy issues as you collect data and engage in public participation. Filter these issues through local and national (and international) energy and climate change visions and policies so that you can prioritise and develop energy goals that meet local needs. Focus group workshops are a good way of identifying important issues and links between energy and other primary local issues. Such workshops will also increase the visibility of your plan and build support for the future. Participants can identify and rank the energy links associated with major city issues. They can help draft energy policy statements and specific goals for the policies.

If at all possible, try to get 'energy for sustainable development' accepted as a key driver for strategic planning activities in the city (this may not be possible early on, but keep bringing it up with the strategic planning teams and processes).

Renewable energy by Bruce Sutherland, City of Cape Town

International energy-related conventions which can support your plan

United Nations Framework Convention on Climate Change (UNFCCC) 1992	This is an intergovernmental treaty developed to address the problem of climate change and which sets out an agreed framework for dealing with the issue. (ICLEI has formal observer status and actively engages with the UNFCCC Secretariat on behalf of local government)
Kyoto Protocol to the UNFCCC 1997	The Protocol does not commit developing countries like South Africa to any quantified emissions targets in the first commitment period (2008-2012).
Millennium Development Goals 2000	The eight Millennium Development Goals (MDGs) form a blueprint agreed to by all the world's countries and leading development institutions. One of these goals is to ensure environmental sustainability. (ICLEI focuses particular on Goal Nr 7, that of ensuring environmental sustainability)
Johannesburg Plan of Implementation World Summit on Sustainable Development 2002	The Plan highlights areas of key importance in terms of meeting sustainable development in terms of economic development, social development and environmental protection. The key focus areas put poverty, sustainable development and Africa high on the global agenda.
2009 Post Kyoto – The Copenhagen Plan?	A new global climate change pact is to replace the Kyoto Protocol in 2012. This should be defined in Copenhagen in 2009 and ICLEI is actively working on a 'Roadmap to Copenhagen' for local governments.

Steps to identifying the hooks

- Become familiar with your city's long- and short-term strategic objectives and vision for the future
- Make a list of your country's relevant energy policies and regulations
- Understand and stay on top of the global climate change and energy agenda and where links can be made with your country and city

Case Study 4

Solar powered by saucy_pan/flickr.com

Finding the hooks to develop a solar-powered city
Rizhao, China

Rizhao, which means City of Sunshine, is a city of 3 million people in northern China. It has over a half a million m^2 of solar water heating panels. 99% of households in the central districts use solar water heaters and more than 30% do so in the outlying villages while almost all traffic signals, streetlights and park illuminations are powered by photovoltaic solar cells. In addition 6,000 households have solar cooking facilities and more than 60,000 greenhouses are heated by solar panels, reducing overhead costs for farmers in nearby areas.

At his appointment in 2001, Mayor Li Zhaoqian recognised that Rizhao, with a lower per capita income than most other neighbouring cities, would have to focus on increasing the efficiency and lowering the cost of solar water heaters. The Shandong Provincial Government provided subsidies for this. Instead of funding the end users as is the case in most industrial countries, the government funded the research and development activities of the solar water heater industry which now cost the same as electric alternatives while saving the users on energy costs.

Mayor Li Zhaoqian and the Rizhao municipal government have adopted several measures and policies aimed at popularising clean energy technology, including the Regulations on Implementing Solar Energy and Construction Integration that standardise the use of solar energy – particularly solar water heaters – in new buildings.

The achievement of solar-powered Rizhao was the result of an unusual convergence of three key factors: a government policy that encourages solar energy use and financially supports research and development, local solar panel industries that seized the opportunity and improved their products and the strong political will of the city's leadership.

www.renewableenergyworld.com/rea/newsstory?id=48605

www.nycclimatesummit.com/casestudies/energy/energy_rizhao.htm

www.worldchanging.com/archives/007060.html

Step 4. Conducting an energy and greenhouse gas (GHG) emissions audit

A vital step in developing your sustainable energy and climate action plan is to collect energy information about your city. This process is known as an 'energy and greenhouse gas emissions audit'. Use your review of your city's goals and policies to help decide what information you should prioritise. Remember that this is the beginning of a process, so while your information may be far from perfect now, engaging in this process will ensure that the quality of the data improves year by year.

Collecting energy information will help to:

- Identify the energy-use areas that are most important in your city
- Assess the energy-use areas that are the highest GHG emitters and assess priority areas for mitigation projects
- Describe the size and shape of the resource-related problems facing the city
- Identify unsustainable trends resulting from current market forces, social conditions, government procedures, regulations and programmes
- Identify organisational mechanisms and partners that can help implement strategies
- Provide base data for evaluating and tracking your city's progress
- Project energy needs into the future.

The energy audit

Apart from basic data on your city's climate, geography, population, economy, housing, businesses, energy etc., your focus will be on energy demand and energy supply information. You want to have data on energy use and GHG emissions by sector and by energy source.

Energy use by fuel type: how much petrol, gas, electricity etc. is consumed by your city.

Carbon emissions by fuel type: how much carbon is emitted by each of the different fuels (you can also include local air quality emissions such as nitrogen and sulphur oxides).

Energy use by sector: how much fuel of what type is used by the residential sector, the transport sector, industry, local authority operations etc.

Carbon emissions by sector: how much carbon is emitted by each sector.