ICLEI Local Governments for Sustainability

IRENA International Renewable Energy Agency

CITY IN FOCUS
MALMÖ, SWEDEN

Integrating Ambitious Renewable Energy Targets in City Planning

SUMMARY

Local targets can set the direction of current and future action and can also support the achievement of national targets. Local governments can develop and set targets in many ways, such as integration into municipal operations, or into comprehensive city strategies and plans, or through sector-specific targets. Generally, environmental targets of local governments include reducing greenhouse gas (GHG) emissions and increasing the share of renewable energy (RE) in a city's energy mix. The city of Malmö in Sweden is a case in point. The city set targets significantly more ambitious than both the European Union's (EU) target for Sweden (49% by 2020) and the national plan (50% by 2020), such that by 2020, Malmö is expected to be climate neutral and have all municipal operations run on 100% RE by 2030. Malmö has benefited from committed local politicians, private investment in RE, strong co-operation with regional stakeholders and a thorough knowledge of the locally available RE sources. Although the implementation plan is still in its early stages, the target setting exercise has been a success in itself and has allowed the local government to integrate, synchronise and mainstream the targets across the City of Malmö's plans. Currently, the master plan is being changed to take the targets into account and work is well underway.

Figure 1: Malmo Vision

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INTRODUCTION

TARGET SETTING AS A LOCAL POLICY TOOL WITH MULTI-LEVEL BENEFIT

Growing concern over climate change and energy security are prompting public and private actors to make concrete longterm commitments at the national and local levels to increase energy conservation, energy efficiency and the use of RE. Local governments, in the process of implementing their targets, can support the achievement of national targets and can set the direction of current and future local action.

A local energy target, for example, can be the achievement of a fixed percentage of RE in the local energy mix by a specific year. In the process, fossil fuel use can be replaced by RE. Another local energy target can be a reduction in energy demand from end-users (local government operations, citizens, businesses). Measurable, reportable and verifiable targets require indicators. An example of a widely adopted indicator is GHG emissions or the share of RE in the overall energy mix of a city or company. The indicator is measured over a defined time period and against a baseline year to allow for comparisons.

Measuring is important, because only when progress towards achieving targets is monitored, evaluated and reported on, can the success of policies and programmes be identified and amendments made. This can be done at the level of the local government's own operations as well as at the community level.

The success of reaching targets often depends upon a local government's commitment for a long time period. Commitment to RE and energy efficiency (EE) can take various forms. Targets and actions can for example be included in policy documents, which detail specific strategies on energy, climate change, or environmental protection. In the ideal case, targets and their implementation strategies are acknowledged in the wider policy or strategy documents of a city, such as a city development strategy.

Including RE targets in a wider policy context and strategy can ensure that RE and EE are addressed across sectors and departments. Ambitious targets are also useful in raising the public profile of energy and environmental issues and allows for sending a clear message to commercial actors. Targets and their associated urban energy agendas, therefore, can play a seminal role in diffusing RE locally and changing the energy mix of a city.

THE POLICY PROCESS OF SETTING AMBITIOUS TARGETS

Various factors can trigger a local government's decision in favour of RE. While a city council's approval of RE targets is normally the crucial step, a local government's political commitment can also be initiated by a city department or a local leader, such as the mayor, community leader or council member. A target could also be set in response to state or national government policies. Such actors could be responding to 1) their own political or administrative mandate, 2) new knowledge (for example on climate change), 3) growing public pressure or 4) private lobbying. Other factors could be the concern over local air pollution, energy security, geo-political considerations, support for local and regional economic development through RE sectors, or other reasons.

Setting an effective RE target depends upon having thorough knowledge of the local energy situation and the locally available RE sources. Such knowledge can be obtained through energy baseline reviews, which gather relevant data on the local energy mix, as well as the locally available RE potential (see case study on potential analysis). Understanding the local energy situation should also include the socio-economic context, the breakdown of economic sectors, and the locally available technologies and skills. When developing targeted policies, it is important to also understand the variety of energy sources and energy users, as well as which technologies are desirable and affordable.

Following an energy baseline review, action priorities, targets and timeframes can be discussed, negotiated and set together with relevant stakeholders (local or regional energy providers, local government departments, businesses, general public, special interest groups, etc.). As a complementary measure, an action plan or roadmap can be drafted, including intermediary steps and possible strategies to reach the targets. Targets are most effective when they are cemented in a legally or politically binding document and enjoy wide public support.

Local governments can develop and set targets in different areas of their responsibilities. For example, they can be integrated into:

» Local government operations. A local government can introduce ambitious targets for its own municipal operations. An example would be including RE provisions for local government buildings and vehicles. As these fall under the direct management of the local government administration, change is expected to be more easily achieved. Local governments can thereby act as a role model and pioneer, testing or piloting various approaches and technologies. In the process, they can raise awareness among their employees, the local public and businesses.

» Comprehensive city strategies and plans. Local governments can develop targets for a community or the entire city. RE and EE targets can be integrated into comprehensive city strategy documents (*e.g.* the master plan or he city development strategy) along with action priorities and implementation strategies. Targets and actions are already often detailed in integrated climate change strategies, sustainable development plans or environmental programmes, where they are closely linked to energy management issues. In these documents, RE often plays a role in reaching other targets such as GHG reduction.

» Sector specific targets. Local governments can also set more specific targets for each sector (*e.g.* transport, buildings, public lighting, etc.). Examples are electricity provision (RE or conventional) or transportation (*e.g.* e-vehicles, fuel used in public transport).

CITY IN FOCUS:
Malmö City, Sweden
Population 0.3 million (2012)

CONTEXT

THE LEADING EXAMPLE OF MALMÖ'S ENERGY POLICIES

In the last few decades, Malmö has benefited from committed local politicians, private investment in RE, and strong co-operation with regional stakeholders. Over the past 20 years, the inner city's disused brown fields and industrial spaces have been re-developed and revitalised with energy efficient buildings and attractive public spaces. Notable examples include the Western Harbour (Västra Hamnen), which operates on 100% RE and Augustenborgin, an industrial area which has 450 m^2 solar thermal panels connected to the central heating system. Solar panels have been installed in school buildings and Malmö is home to Sweden's largest solar energy plant, *i.e.* Sege Park's 1250 m^2 photovoltaic panels. Since 2009, Malmö has aimed to become one of the world's leading climate neutral cities.

DESCRIPTION OF ACTIVITIES

SETTING AMBITIOUS RE TARGETS

Malmö's environmental challenges. In 2007, the City of Malmö initiated a study on local environmental challenges. Five working groups were set up to investigate different issues and to suggest objectives and measures. Climate change featured strongly as well as related questions on energy production and consumption. The final document *Begränsadklimatpåverkan* (*Limited Climate Impact*) reviewed existing international, national and regional targets. It informed the overall vision for the city, which was then defined by the local government with the Environment Programme in 2009.

Ambitious targets for the City of Malmö. Two documents, the *Environmental Programme* and the *Energy Strategy*, outline the targets for the city as a whole, including municipal operations. "By 2020, the City of Malmö will be climate neutral and by 2030 all municipal operations will run on 100% renewable energy" (*Environmental Programme*, 2009). The largest contribution should come from locally generated RE. These objectives are significantly more

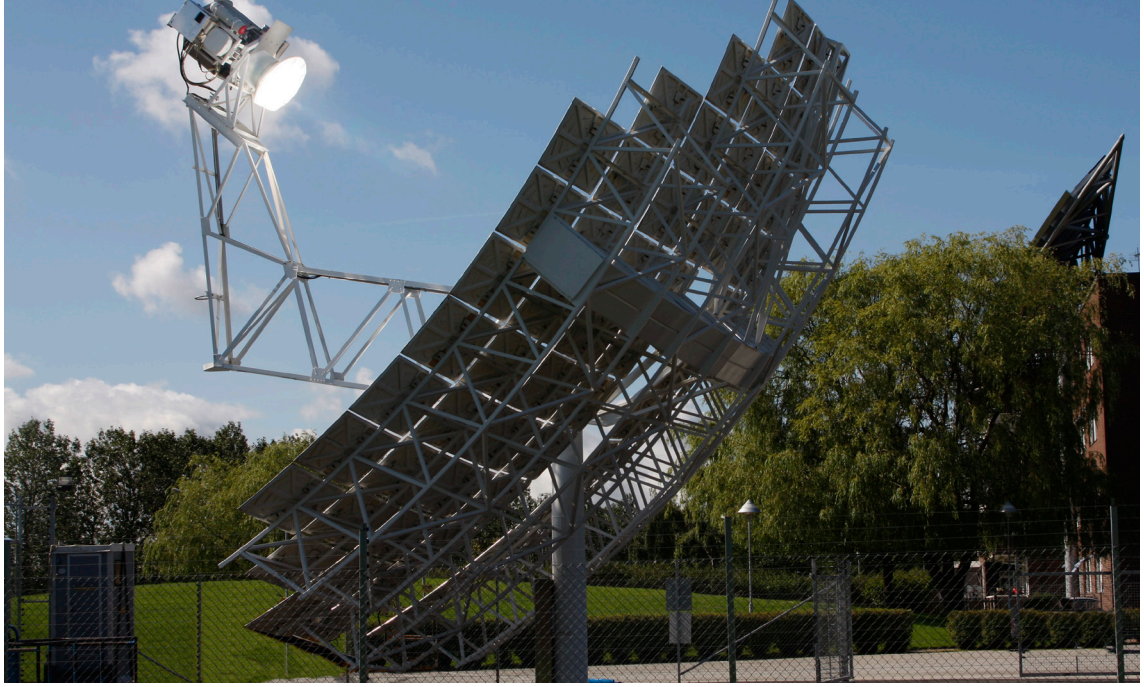

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Figure 2: Solar Stirling Engine

ambitious than both the European Union (EU) target for Sweden (49% by 2020) and the national plan (50% by 2020). Yet, the targets represent what the local government thinks is achievable.

The Environmental Programme. The *Environmental Programme for the City of Malmö 2009-2020* documents a variety of environmental goals including the RE goals established and adopted by Malmö's municipal parliament in 2009. The *Environmental Programme* was adopted unanimously across party lines, reflecting the commitment to achieve its objectives. No individual has the authority to change the decision and local politicians are held accountable for attaining the targets. A variety of environmental goals were set, including:

» More efficient energy consumption. By 2020, energy consumption in Malmö will decrease by at least 20% per person compared to the average consumption during 2001-2005. By 2030, this is to drop a further 20%.

» More renewable energy. Solar, wind, water and biogas will be phased in and fossil fuels phased out. The proportion of RE by 2020 is to reach 100%. The Programmes' ambition is for as large a proportion of this energy as possible to be produced locally.

» Reduction of emissions. By 2020, GHG emissions will decrease by at least 40%, calculated from a baseline measured in 1990.

» Transition in transport and travel. The significant development of rail traffic and other electrically (green electricity) driven public transport, as well as an extended network of cycle lanes, will create new possibilities for local and regional travel. The capacity for transporting goods by ferry and train will be improved.

» Adaptation to climate change. Malmö will prepare for temperature changes, rising sea levels, and increased precipitation. Foresight can provide for lower costs and an improved environment.

The *Energy Strategy* (*Energistrategi för Malmö*). According to Swedish Law (*Municipal Energy Planning Act - SFS 1977:439*), municipalities must have a plan "for the supply, distribution and use of energy in the municipality". For Malmö, this is the 2008 *Energy Strategy* (publicly consulted on and approved in December 2009). The Energy Strategy is complementary to the *Environmental Programme* and is a necessary tool for the implementation process. The strategy details more specifically the RE energy targets and action opportunities, with targets that include:

Regional leadership and collaboration

At a regional level, Malmö is also a part of *Energy Öresund*, the strategic energy plan combining numerous Danish and Swedish municipalities that work together with the goal of being the first carbon dioxide (CO_2) neutral region in Europe. This project in which municipalities and energy companies work together on regional demonstration projects, costs EUR 1.25 million, half of these funds are from the EU. Strategic energy planning for the larger geographical region encourages synergies and co-operation. The project, running from 2011 to 2014, is important to Malmö in reaching their targets and allows the local population and companies to source clean energy from the surrounding region.

Source: Energi Öresund 2011 (Accessed Nov 2012); www.energioresund.org/OmEnergiresund

- For the entire city:
  - Energy consumption will be reduced by at least 20% per capita compared to the average use during 2001 to 2005.
  - RE should be at least 50% of the overall energy mix.
  - Public transport is to be 100% powered by RE.
  - GHG emissions must be reduced by at least 40% from 1990.

- City of Malmö's activities (local government operations):
  - Energy consumption will be reduced by at least 30% compared to the average use during 2001 to 2005.
  - All municipal operations will run on 100% RE.
  - Energy costs will be reduced.
  - A risk and vulnerability analysis will form the basis for prioritising the risk of supply disruptions in the energy system.

The *Energy Strategy* further details the principal strategic approach. Three key areas are targeted: 1) more efficient use of energy, 2) switching to RE sources, and 3) better planning, economy (*e.g.* a greater competition in the energy sector and co-ordinated procurement), security (*e.g.* contingency planning) and knowledge (*e.g.* increased research and development, and greater awareness).

Tracking progress. Targets are reviewed and presented in an annual report, based on a set of indicators. Various experts are subsequently invited to comment on the indicators. This allows for analysing developments, identifying problem areas and making recommendations for what remains to be completed. To store the data on the targets, the municipality updates an online portal *Miljöbarometern* (Environmental Barometer), which monitors the progress of all environmental indicators for the municipality. This allows residents to keep track of its progress and targets. Such a portal is important for local governments in order to ensure their targets are communicated and are tracked.

RESULTS

MAINSTREAMING RE AND EE TARGETS

Setting the ambitious targets was a success in itself. The process allowed the local government to integrate, synchronise and mainstream the targets across the City of Malmö's plans. Currently the master plan is being changed to take the targets into account. There are various departments in the municipality working on various issues, such as implementation, tracking and monitoring of the targets, recording the annual data, educating the public on EE, and practical installation of services and infrastructure (amongst others). The implementation plan is still in the early stages, but aims to achieve the targets set out in the *Energy Strategy* and the *Environmental Programme*.

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Figure 3: Tegelborgen solar collector

Among other initiatives to help the city reach its target to be climate neutral, Malmö is starting a local climate fund to compensate GHG emissions from municipal activities through increased investments in RE. Most of the projects are privately funded with large energy companies such as E.ON backing the proposals.

LESSONS LEARNT FOR REPLICATION

Ensure political backing and cross-department co-operation towards city-wide targets. The engagement of local politicians, who are willing to take action and set targets that exceed those at the national level, is imperative as it provides strong leadership from within the municipality. Cross-party political consensus provides a very clear statement of intent. This is even more important where nationally-led targets on GHG, EE and RE are absent. For realistic yet ambitious targets, it is important to include all relevant local government departments and operations in the development process.

Involve local and regional stakeholders. A comprehensive RE target should encompass the whole community and be based upon a participatory approach. This encourages ownership of the roadmap (action plan), which outlines measures to be taken and accounts for different opportunities. Reaching beyond the city geographical boundaries can also be considered. For example, linking to the regional government and other municipalities can strengthen approaches to ensure a consistent and interconnected strategy on RE.

Work with what you have. The use of local resources is vital. Depending on location and climate, there are variations in the potential of wind, solar, water, waves and tides, geothermal, waste and bio-material (algae, wood, etc.), industrial waste heat or biogas. Targets can be set per RE source. Targets may also differ according to the age of a city and trends in urbanisation. A mature stable city may find it more cost-effective to look first into energy demand reduction and plan the transition of remaining demand to RE. A rapidly growing city may wish to directly satisfy growing energy needs with RE. Certain local government departments or other local actors may already have substantial knowledge to capitalise on while developing targets and a roadmap.

Set your targets together with energy companies. Local energy utility providers should be brought on board at an early stage along with other relevant private sector stakeholders to identify and support targets. Fostering public-private partnerships between local governments and private energy companies on RE is important; without a variety of energy providers being part of the

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Figure 4: Photovoltaics in the Western Harbor

project, RE targets are unlikely to be met. There are also difficulties attached to such an approach, including information gathering (aggregated energy data by sector) and balancing public with private interests. Targets can be instrumental in challenging the status quo and what the private sector can deliver in an open, transparent and consultative way.

Collaborate with others in setting more ambitious targets. Taking the initiative to engage in regional or cross-border collaboration can provide a unique opportunity for co-operation on energy projects and can allow combining resources to work towards a common goal. The inclusion of multiple stakeholders (universities, researchers, private, public, and non-governmental organisations (NGOs)) in this process is also relevant for effective collaboration. National and international governments can provide the institutional and organisational platforms, in addition to stabilising national energy policies.

Leading by example in municipal operations, Calgary, Canada (population 1.1 million)

For 2012, the City of Calgary set itself a 100% renewable energy electricity target for its municipal operations. Ambitious targets and long term strategy have been broken down into several shorter, achievable plans. These have been key to realising the goal. The fact that the electric utility ENMAX is owned by the City of Calgary has also contributed to the success. The local government has progressed through different milestones. In 2002 the local government launched its first RE project *Ride the Wind* program, with Calgary's Light Rail Transit powered 100% by RE. In 2004, the council approved the *Corporate Climate Change Action Plan*, setting the targets to promote RE and reduce emissions. In March 2005, the council recommended a staged approach towards a target of at least 75% green electricity by 2007 and greater than 90% green electricity by 2012. In July 2005, the City and ENMAX Energy executed the electricity service supply agreement so that, effective January 2007, a full 75% of the City of Calgary's electricity supply each year would come from renewable sources. In January 2009, the city council approved a motion to amend the Electricity Retail Contract between the City of Calgary and ENMAX Energy to purchase additional renewable electricity. In 2012, the local government purchases 100% of its electricity from renewable sources.

Source: City of Calgary (accessed Nov 2012), 100% renewable in 2012, www.calgary.ca/

Small steps towards more ambition, Daegu, Korea (population 2.5 million)

Daegu declared itself a "solar city" in 2004 and started to work on a comprehensive policy approach to promote the use of RE. The plan called for a 5% RE target on total energy consumption by 2012, and for a 15% reduction in total energy consumption by 2030. The declared strategy was to gradually reduce GHG emissions by integrating RE into the urban development policies. It also includes a number of demonstration projects in public buildings, schools, universities, and public information campaigns. In the reality, however, concrete measures to promote RE have hardly followed the declared commitments and the bulk of the work is still ahead. This highlights the need for comprehensive and consistent approaches, where political commitment is met by action. Source: University of Amsterdam and ICLEI (2012).

Source: REN21, ISEP, ICLEI (2011), Global Status Report on Local Renewable Energy Policies

Communities lead with ambitious targets, Frederikshavn, Denmark (population 0.03 million)

Frederikshavn plans to be 100% RE reliant by 2015, including its municipal operations, private households, businesses and the transportation sector. The target was set in 2006 along national plans to make Frederikshavn a model city for Denmark. The model city will showcase a diversity of RE technologies, energy management practices and distributed energy system models. In 2012 the city sourced 24% of its energy from RE. The municipality established the *Energy City Frederikshavn Foundation* to be responsible for implementing the 100% target, in partnership with major stakeholders (companies, educational institutions, energy planners, and key industry players like steel mills). The expected investment cost is DNK 1 billion (Danish kroner; more than USD 170 million). Source: University of Amsterdam and ICLEI (2012).

Source:
REN21, ISEP, ICLEI (2011), Global Status Report on Local Renewable Energy Policies

Further readings:

See additional relevant case studies at www.iclei.org/casestudies, for example:
140 - The Eco-City Building Plan of Rizhao Rizhao, China

REFERENCES

City of Malmö (2008), *Energistrategi för Malmö, Pr 3083, Godkänd av kommunfullmäktige (adopted 17 December 2009).*

City of Malmö *(adopted 17 December 2009), Environmental Programme for the City of Malmö 2009 - 2020.*

City of Malmö (2009), *Climate Smart Malmö, Making sustainability a reality.*

City of Malmö (May 2008), *Potential to increase the share of renewable energy in Malmö's Energy system.*

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