



Learning network of cities in Flanders – State of sustainable city planning and implementation, key issues and priorities



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1 Summary

VITO, one of the Knowledge partners in the STEP UP consortium, conducted interviews and the analysis of 6 companion cities to the STEP UP partner city of Ghent: Antwerp, Genk, Hasselt, Leuven, Mechelen and Ostend. These Flemish cities have populations reaching from about 50.000 up to 500.000

Out of the six cities interviewed three (Antwerp, Genk and Hasselt) had a SEAP which was submitted and accepted by the Covenant of Mayors SEAP.

The interviewed Flemish cities, and especially the first ones who made their SEAPs, developed them on the basis of existing climate plans. Therefore the focus of these plans is very much on the related greenhouse gas emissions. Second, the fact that many cities were already involved in executing Climate Plans makes these SEAPs medium-term plans with a horizon of 2020 against the background of Climate Plans with targets up to 2050. Cities in Flanders also have an existing culture of integrating stakeholders using the 'triple' or 'quadruple' helix (public authorities, knowledge institutes, companies and citizens) - the bottom-up approach.

All cities have a wide portfolio of measures in their SEAPs related to the built environment, transport and renewable energies. Some of those initiatives are already taking place and where cities have found they have similar challenges and policy contexts, some of the projects have been replicated amongst other cities. However, one of the greatest challenges to these cities is to translate the plans into real action on the ground or implementation. The SEAPs are often treated as 'Sustainable Energy Menus' and clarity on how the targets can be met could be improved. In particular, insufficient resource to enable the collection and processing of data was identified as a barrier to the implementation and monitoring of SEAPs.

It is also clear that in the implementation stage stakeholder involvement and ownership are needed. When city services are concerned (city service buildings and transport) only one stakeholder is responsible (in this case the city administration) and it is clear that these initiatives develop very well. However, such initiatives only concern a minor part of the city footprint, typically 1-5%. The major part of the city footprint concerns many other stakeholders within the city, so still a lot of work remains to be done to integrate them and to align top-down and bottom-up approaches.

Effective involvement of the tertiary sector is also an issue, concerning energy efficiency and renewable energy actions in the built environment from small shops to hotels, offices, schools and hospitals. This sector also has an impact on transport within the city.

In addition, technical, legal, institutional and societal/behavioural barriers remain. There is not only a need for new financial mechanisms, but also a need for looking at costs, institutions and laws differently. Many higher level policies also still interfere negatively with the targets set and need to be solved at that level for cities to be able to reach their targets.

Many of the issues outlined above require a culture of consultation between the many stakeholders that affect the cities' future. Only consultation vertically within a city between city stakeholders, and horizontally between cities can help to find the way to solve the issues.

One specific practical need cities raised was the need for monitoring and the lack of data available to be able to evaluate their trajectory but also the campaigns and actions they undertake to

stimulate the other stakeholders to undertake their share of the work. Good practice examples are welcomed and data should be available between policy levels.

To summarise, key issues and needs emerging from the interviews were as follows:

- Integrating stakeholder involvement and ownership across all stages of city planning and implementation
- Financing city projects
- Integration of the tertiary sector into city planning
- Understanding and overcoming multiple barriers to implementation
- Negative influence of high level policy on city sustainability targets
- A lack of data availability
- The need for monitoring and evaluation measures at a city level
- The availability of good practice examples and data between policy levels

A lot remains to be done but Flemish cities are on the right track and they, together with their stakeholders, are changing their mindset gradually to take up the challenges which should improve their sustainability.

2 Context

The companion cities to the city of Ghent for the STEP-UP project are all Flemish so-called center cities. They are center cities because they exert upon their surroundings a central function for employment, healthcare, education, culture, leisure, shopping and so on. Flanders has 13 such center cities (Figure 1). Owing to this function these 13 cities receive structural financing from the Flemish government to increase livability at the city and neighborhood level, to reduce social segregation and to increase the quality of government of the city. Out of these 13 cities, the 6 cities of Antwerp, Ostend, Leuven, Genk, Hasselt and Mechelen have shown their commitment to the STEP-UP project. Next to Ghent, the cities of Antwerp, Hasselt and Leuven are also provincial capitals and home to provincial authorities and administrations.

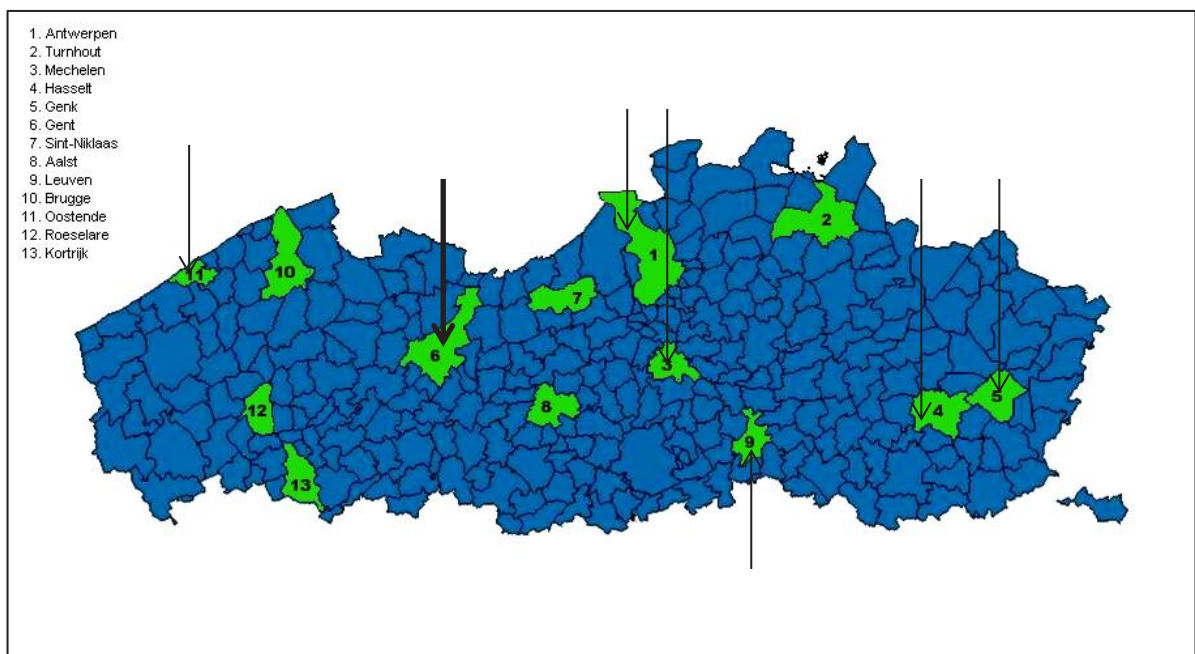


Figure 1 The 13 Flemish center cities, with the companion cities (arrows) of Ghent (bold arrow) indicated (adapted from source: Wikimedia commons).

To European standards these are rather small cities, with the size of the cities varying from about 60,000 up to more than 500,000 residents (Table 1), but they have to be seen in the wider context of a very urbanized Flemish landscape of metropolitan areas and regional urbanized areas. One could thus consider Flanders as one big city, but it consists of a network of many relatively small urban centers rather than a real global metropolis. The city centers are fairly dense built areas, mostly composed of a historic center, surrounded by a 19th century belt, followed by a 20th century belt. Genk is an exception as it is rather composed of garden suburbs mainly built around the 20th century coalmines. Except for Genk which has national connections, all cities have international railway connections. They are all connected with important national and European highways, and canals and rivers connect the cities to the sea or to other cities.

Table 1 Size of Ghent and the STEP-UP companion cities

City	inhabitants	Area (km ²)	density
Ghent	248,000	156.18	1,588/km²
Antwerp	512,000	204.51	2,503/km ²
Leuven	100,000	56.63	1,766/km ²
Mechelen	82,000	33.71	2,433/km ²
Hasselt	75,000	102.24	734/km ²
Oostende	70,000	37.72	1,856/km ²
Genk	65,000	87.85	739/km ²

Demographic projections

While there is some variety between the Flemish center cities, some general future tendencies are important to take into account. Current projections show an increase in the number of households, in particular single and two person households. Projections show the number of bigger households will decrease. This has important consequences for the housing market and housing policy; it will increase consumption per capita as some consumption items are needed per household; more mobility problems as cars might have lower seat occupancy and more negative environmental impacts (greenhouse gas emissions, waste, water pollution, energy and space use).

The increase of single people in cities has even more specific consequences as single people are, as studies reveal, in general, less healthy, have lower employment, higher poverty risk, lower social participation rates and they are rather tenants than house owners¹.

The number of elderly people (and especially single elderly and above 80 year-olds) in Flemish cities will increase with additional consequences in terms of social exclusion and healthcare problems. The long occupancy of large dwellings by older couples also causes a suboptimal use of available space. This is worsened by the fact that many elderly people, compared to other single and two person households in cities, are homeowners. These dwellings represent a rather large portion of the urban housing stock, and home owners have very little incentive to undertake renovation measures.

Currently and towards the end of this decade children will take up a larger share of the city population, having consequences for provisions such as education.

Long term challenges

When asked about their long term challenges most cities refer to their recent coalition agreement for the next political term. Although these policy lines are for a short period of 6 years, most of them include longer term challenges. The Flemish center cities have similar challenges to cope with: fighting poverty and underprivileged households, increasing employment, attracting youngsters and young families, providing affordable housing, efficient mobility, safety, greening the city, increasing livability, etc.

¹ Studiedienst van de Vlaamse Regering, 2011-Projecties van de bevolking en de huishoudens voor Vlaamse steden en gemeenten, 2009 – 2030

3 Planning – Sustainable Energy Action Plans

All of the Flemish companion cities have signed the Covenant of Mayors (CoM) and have either submitted their Sustainable Energy Action Plan (SEAP) or are preparing it (Table 2). As such the Covenant of Mayors might well be the first long term commitment these cities make, commitments beyond the six year political term. Some are even already looking further ahead with long term goals towards 2050.

Climate Plans

Most of the SEAPs have been based upon climate plans which were developed or under development at the time of the CoM signature (Table 2). At that time there was no clear framework for developing a SEAP. More recent Flemish city initiatives can work according to the framework currently provided by the CoM.

Climate plans are focused on greenhouse gas emissions rather than energy, and encompass more sectors than a SEAP. In general, however, the Flemish cities have been able to develop climate plans and infer from these plans figures and other elements to constitute a SEAP. A focus on measures to reduce energy sector greenhouse gas emissions in the climate plan quite easily leads to measures for the SEAP.

Table 2 SEAP and targets for the learning network²

City	SEAP	2020 target (baseline)	Long term goal
Ghent	Climate Plan 2008-2020 (submitted in 2008)	>20% emission reduction (2008)	'neutrality in 2050'
Antwerp	Climate Plan 2010-2020 (submitted 2011)	>20% emission reduction (2005)	'neutrality in 2050'
Genk	Climate Plan 2010-2013 (submitted 2012)	>21% emission reduction (2005)	'neutrality in 2050'
Hasselt	Climate plan 2012-2020 (submitted 2012)	>20% emission reduction (2005)	'neutrality in 2050'
Leuven	Report as a basis for a plan towards 2050, SEAP under development	22% emission reduction (2010)	80% emission reduction by 2050*
Ostend	Report as a basis for a plan towards 2020, SEAP under development	>20% (2007)	
Mechelen	Signed the CoM in 2012		'neutrality in 2030'

*The city of Leuven has also the long term goal of becoming carbon neutral, but in contrast to the other cities Leuven already made scenarios with assumptions leading up to this concrete target. Other cities haven't made the exercise up to 2050 yet.

Long term visions

When looking at the process, the development of climate plans has triggered the involved politicians, city services and other stakeholders in Flanders to think together beyond the next political term. Before these climate plans or their commitment to the Covenant of Mayors, apart from mobility plans and some general visions on urban development for the year 2020 there

² Many cities have stated climate neutrality in 2050 as the ambition of their climate plan. Most of them, however, have made their plans up to 2020. Leuven also made a scenario up to 2050 and based on existing knowledge a 80% reduction seems more realistic for the time being.

generally were no other long term city initiatives. The sustainability agenda, mainly spurred by sustainable energy and climate change challenges, has stimulated city stakeholders to think further ahead than usual. Some cities have already targeted at 2030 or even 2050 and more cities are now engaging into vision exercises and transition management based trajectories with participation of local stakeholders.

Stakeholder participation

There are as many different stakeholder participation constellations as there are stakeholder participation initiatives. This is not different for the development of the climate plans and SEAPs in Flanders. Although not all cities have successfully organized a broader participation of stakeholders, those who didn't now recognize the need for stakeholder involvement for the further process and for ultimate success. In some cities the climate plan was developed by city services only, while in others this was achieved by representatives from a triple helix (including academics and the private sector) or even quadruple helix (including citizens as stakeholders). But even in triple or quadruple helix settings different approaches were used.

Integrated sustainability

Although a climate plan is framed by the challenge of combating and coping with the effects of climate change, and a SEAP by the challenge of reducing energy consumption and increasing energy efficiency and renewable energy production by 2020, all cities stress the need to take into account all the other aspects of sustainability. Neither climate change nor sustainable energy can be properly addressed without simultaneously providing solutions for ecosystems and biodiversity within the city, considering the urban water cycle, aiming at waste reduction and recycling, etc. The same principle holds for socio-economic aspects of sustainable development.

4 Greenhouse gas emission profiles

To track progress of emission reductions within a city's territory (or territorial emissions) cities draw up a (baseline) emission inventory (BEI) where emission data for a specific year are gathered and represented per sector. These inventories also allow cities to get a better idea of where all the different emissions occur and which sectors are important to take into account when listing measures and developing projects. Such inventories have been conducted in five out of six Flemish companion cities (all except Mechelen) and the partner city Ghent for a specific reference year and/or for 1990.

In the figures below, data from the latest emission inventories have been represented for Ghent and the companion cities who have them available. Figure 2 shows the cities' profiles for greenhouse gas emissions on their territory. Not all emissions are shown: only the sectors built environment, transport (without waterborne transport) and industry are represented; emissions or sinks from agriculture and nature are not included.

The comparison clearly shows the industrial profile of Genk, Ghent and Antwerp, with Ghent and Antwerp having a large presence of industrial companies covered by the European Emission Trading System (ETS). Among these plants are also some energy production facilities. They are represented in a separate column to avoid double counting. The emissions related to the consumption of electricity by the different sectors are already accounted for at sector level. The emissions from electricity production of a production site have to be attributed to the consumers of that electricity and the electricity generated in the plants in Antwerp, Ghent and Genk is only partially consumed in those cities.

Because the emissions of large industrial facilities and energy production sites are regulated through the ETS and consumption of the produced power should be attributed to the final consumer, territorial emissions are included

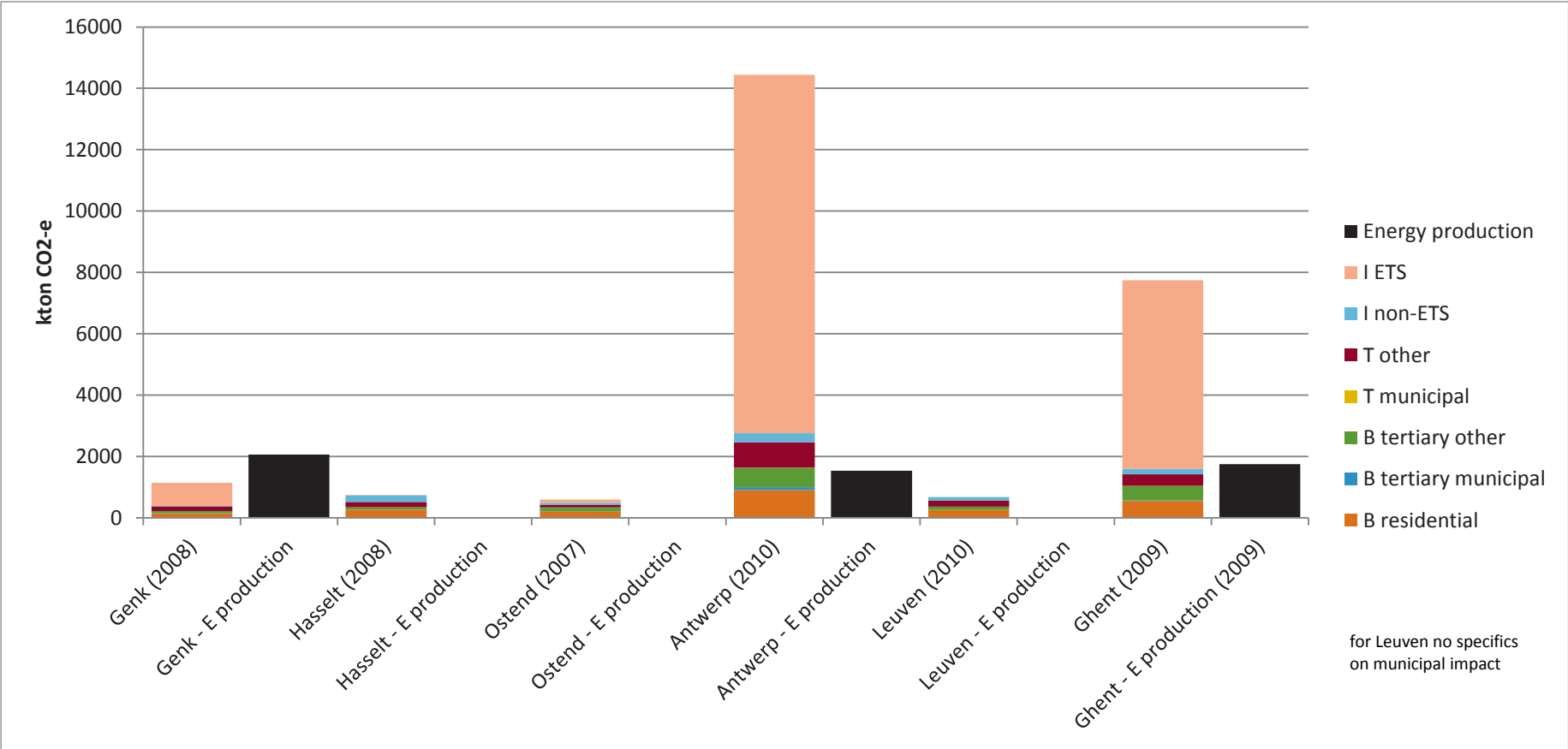


Figure 2 Most recent territorial emission profiles of the companion cities for the CoM sectors (I is for industry, T for transport and B for built environment)

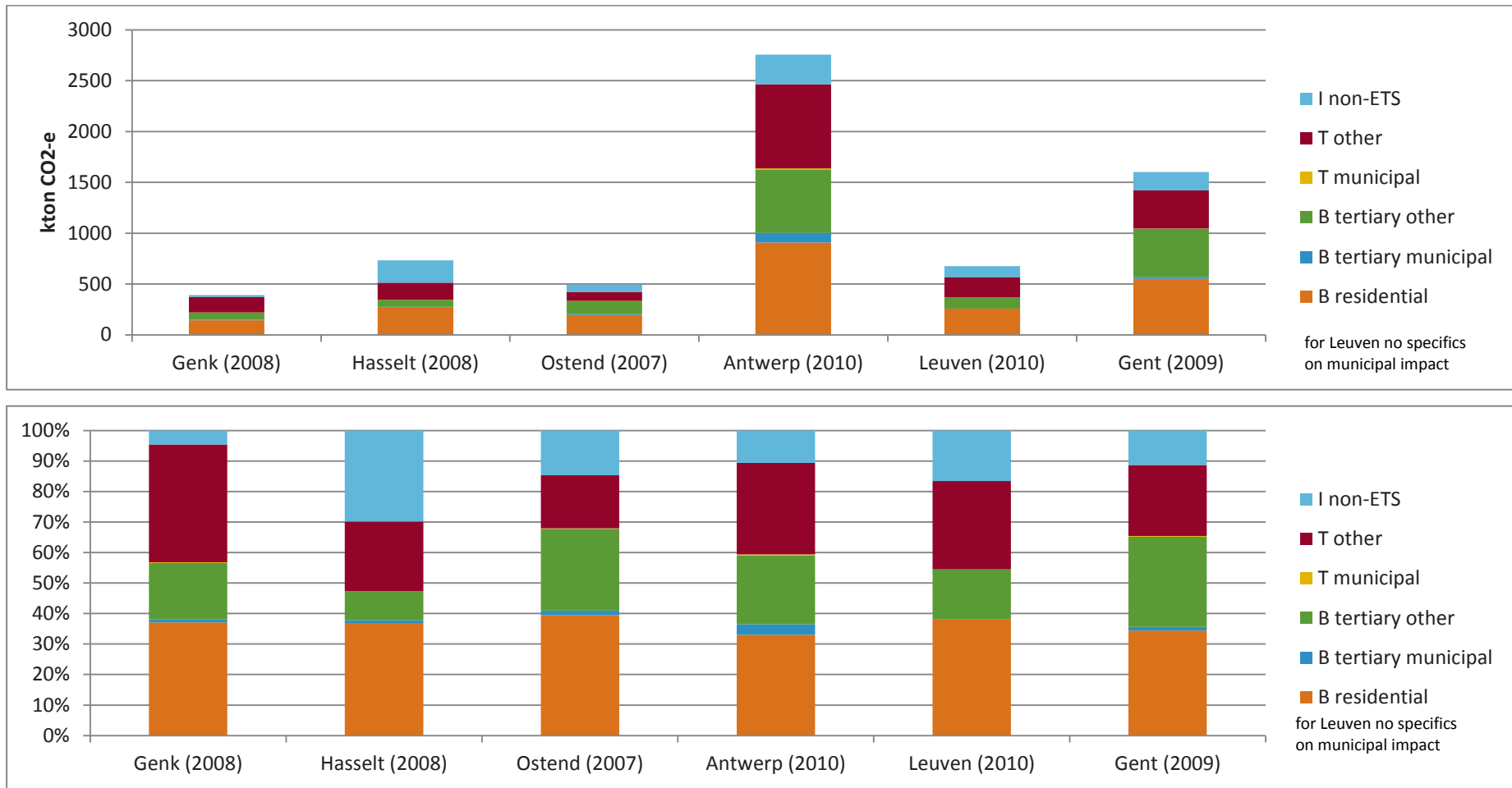


Figure 3 Importance of different sector emissions, electricity production and ETS companies excluded (I is for industry, T for transport and B for built environment)

Energy efficiency, renewable energy and sustainable transport measures taken at the level of **municipal services** can have an important exemplary function, or even when possible take on a pioneering role or lower the barrier for market introductions of new techniques and solutions. But the share of these municipal emissions is very small compared to other sectors on cities' territories. The emissions caused by municipal services' transport and emissions in the built environment under municipal management (public lighting, heating and electrification of municipal buildings) hardly represent 1-2%; for the larger city of Antwerp this is 4-5%.

In between 30 and 40% of emissions on the cities' territories are related to the **residential sector**. More or less one third of the emissions from these cities are thus caused by households for the heating of their homes, provision of sanitary hot water, lighting and electric appliances. Another 10-25% of greenhouse gas emissions can be attributed to the **tertiary sector** with its electric appliances and heating and cooling of office buildings, hospitals, shops, hotels, restaurants and bars. The built environment is responsible for 47-68% of greenhouse gas emissions of these cities. This is still an underestimation as buildings for offices and other purposes used by companies in the industrial sector are counted towards the industrial sector, while their profile and the measures needed to decrease greenhouse gas emissions are typically those of the tertiary sector.

About 27-40% of emissions are caused by **transport**. These high percentages are mainly caused by the presence of major highways on the territory of all of the companion cities. The lowest share of transport emissions is not surprisingly the one for Ostend as it only has a national highway which ends there but no highways passing through. Highway traffic can be partially related to the city (destination and departure traffic) but also includes passing-through traffic in many cases³. The composition and efficiency of the fleet using these highways can be hardly called a city competence.

Calculations of the emission inventories were based on best practices in line with IPCC regulations. When data were not clearly available, they were based upon tested models and, where necessary, expert opinion. The baseline emission inventories for these Flemish cities were made by consultants and knowledge institutes which have all cross-pollinated each other while doing the exercise. Therefore similar assumptions have been made. For more information on the BEI reports, see Annexes 1-6.

³ As for the so-called indirect emissions from electricity production, the emissions from passing-through traffic should ideally be deducted from these territorial emissions as they are not related to the city as such. Some traffic models allow for that.

5 Measures from the SEAPs

Sustainable Energy Menus

When looking at the current SEAPs and climate plans, one could rather call most of them SEMs or Sustainable Energy Menus instead of Sustainable Energy Action Plans. Cities have produced lists of possible measures per sector rather than producing concrete plans and making clear choices. In the end the menu for all the cities is quite similar with some city specifics related to the choices made by the group of stakeholders they consulted. Depending upon the approach some additional data have been provided. These include estimates of possible uptake percentages, impacts, financials, timings etc. It is difficult to crystallize a real action plan out of these listings. In some of the Flemish companion cities the menus remain menus which can then later on be used as frameworks for campaigns or actions. In fact, the menus have in some cases been based upon measures that were already ongoing in the cities, completed with new ones based on best practices. In some of the larger Flemish companion cities the measures are further elaborated into specific actions which are not detailed in the SEAP but which are part of their own internal management system. However, none of the Flemish companion cities have really been able to come to a real energy action plan, and all of them acknowledge this as a challenge for the revision of their SEAP.

Selection procedures

The selection of measures for the climate plan and/or SEAP was done on the basis of long lists of existing actions and best practice examples of measures which were later reduced to short lists through selections by steering committees with different compositions: consulting firms, city services, knowledge institutes, local stakeholders, sector organisations etc.

Some cities have performed Multi Criteria Analyses (MCA) to incorporate other criteria than just cost-efficiency or impact in terms of energy reduction and have included environmental criteria, acceptance and attractiveness criteria, criteria on barriers, feasibility and timing. The trias energetica principle is also a much used criterion to select and even more so to prioritize measures.

Below we list the typical measures for the built environment, transport and renewable energy production in the Flemish companion cities. Cross-sector measures were not identified yet. Most of the Flemish companion cities did not distinguish between the identified measures to reach targets (the technical measure e.g. installing PV), and the secondary measures needed to get those technical measures implemented or to stimulate implementation by third parties (the related policy measures e.g. a subsidy program for PV). In most cases, they are all grouped as measures without distinction between the two categories.

5.1 Built environment

The emission profiles show that the built environment and more specifically the residential sector is the most important sector for cities. Many cities have recognized the opportunities and additional benefits of energy efficiency in buildings, with a specific focus on existing buildings, since it is estimated that 60% of the Flemish building stock of 2050 already exists today (Van Holm et al., 2012⁴). Consequently the existing building stock for both the horizons 2020 and 2050 is an important focus area.

⁴ Van Holm et al. (2012) Inventarisatie van doorgedreven energetische renovatie van woongebouwen. Study commissioned by the Flemish Energy Agency

The measures identified for the built environment can be split into 3 or 4 categories: residential buildings, tertiary sector buildings, municipal buildings and public lighting.

The residential sector measures are mostly related to measures or packages of measures of all kinds that reduce energy demand and primary energy consumption (insulation), including passive house standards for new buildings, low energy renovations, and improvement of technical installations. In some cases specific awareness raising campaigns aimed at reducing household energy consumption are included as measures. In the Flemish center cities, the housing market is very dispersed with over 85% of the housing stock in private ownership and 58% of the stock are owner occupied dwellings⁵. The uptake of promoted measures therefore depends heavily upon private initiative by individual home owners. Moreover, in the case of the renovation of rented houses –about 24% of the current stock are privately owned rental houses- the financial incentives for landlord and tenant are conflicting when no additional measures are taken (i.e. the split incentive problem).

While the identified measures for the residential sector are typically the same in all cities, approaches to get them implemented and turn them into actions can differ. Among the policy measures included in the SEAPs and climate plans of the Flemish companion cities we find: awareness raising and information campaigns, subsidy schemes, group purchases for insulation, facilitation for group renovations, free advice on sustainable building solutions for city residents, provision of energy scans for free or at reduced rates, provision of beneficial loans for energy saving measures for specific target groups etc.

The tertiary sector, encompassing all non-residential buildings except industrial buildings, is very diverse. In general the lack of knowledge about this multi-faceted sector and about possible measures but also the lack of involvement of the sector itself is recognized by the Flemish companion cities. Small shops and offices resemble residential buildings, so many of the measures for the residential sector apply for these buildings as well. Other typical measures concern reducing heat loss by permanently open shop doors, relighting and the reduction of HVAC energy consumption by means of renewing HVAC systems or components. To support the implementation of the measures cities also invest in information campaigns about possible measures and specific subsidies for the sector.

For municipal buildings cities mention the optimization of energy consumption in their buildings through a variety of measures like low-energy and passive house standards for new buildings, low-energy retrofitting of existing buildings and engaging into Energy Performance Contracting (EPC) with ESCOs. The latter, for example, is a typical policy measure to improve the energy performance of municipal buildings, rather than a technical measure of its own. This is complemented with awareness-raising activities on energy consumption for the city personnel.

For public lighting cities have worked out lighting plans or are already implementing them. These plans involve LED relighting and testing of dynamic smart urban lighting.

For the measures which require involvement from other parties than the city administration itself, cities rely mainly upon broad awareness raising and facilitation actions. In many cases the listed initiatives for the residential sector are accompanying measures for the European, Belgian and Flemish legislation and their subsidy schemes.

⁵ Kenniscentrum Vlaamse steden, based on a socio-economical survey in 2001. URL: <http://www.kenniscentrumvlaamsesteden.be/kennisbank/kaarten/huisvesting/Pages/Gemiddeldecentrumstedenvl.aspx>

5.2 Transport

The city profiles for the Flemish companion cities show the importance of transport emissions. As mentioned above, the bigger share is due to the emissions caused by passenger and freight transport on the highways starting, ending or passing through the territories. Apart from the movements from or to the city, cities cannot influence traffic that is passing through directly and depend upon higher policy level measures to reduce or control demand for mobility, increase the modal share of public and soft transport modes, and reduce emissions through improving environmental performances of vehicles, increasing the share of vehicles running on renewable energy and improving infrastructures to reduce congestion.

In general, cities are upgrading their inner city centers to facilitate more environmentally friendly transport behavior by improving pedestrian and bicycle infrastructure and by installing infrastructure for electric vehicles. Other measures to stimulate modal shift towards sustainable transport modes, like rolling out a network of city bikes, car-sharing parking spots and the general promotion and enhancement of public transport are also listed.

It must be noticed that the federal government has specific policies in place to make public transport, car sharing and bike transport for commuters financially interesting.

The installation of electric charging infrastructures is organized at regional level through the Flemish Living Lab Electrical Vehicles⁶ program, in order to accelerate innovation and adoption of this technology.

Most cities have engaged themselves to make their municipal fleet more sustainable by purchasing electric, Compressed Natural Gas (CNG) and hybrid vehicles. For their personnel they have introduced sustainable mobility policies and general information campaigns about sustainable commuting and transport during working hours.

For public transport, cities partially depend upon the public transport companies for improving train, tram and bus transport facilities and for the environmental performances of these vehicles. Cities have listed measures related to these companies and so they will have to effectively engage with them in order to get their measures implemented.

While only with difficulty can cities influence traffic on the highways on their territory, they have a much bigger influence on freight and passenger traffic within their city or city center. However, an interesting point is that none of the Flemish companion cities are currently considering a congestion tax, although discussion about these mechanisms recently has intensified at the Flemish, Brussels capital and federal policy level. The interest for alternative city logistics systems is, however, increasing. Only Hasselt has already implemented such a city logistic system with a clean fleet of smaller vehicles⁷. Other cities are becoming interested because of the additional benefits such a system can create for decreasing air pollution, traffic congestion, noise etc.

⁶ See <http://www.livinglab-ev.be/>

⁷ See <http://www.citydepot.be/>

5.3 Renewable energy production, energy from waste streams and energy distribution

Renewable energy production for municipal services by means of PV panels on municipal building roofs, CHP installations, solar boilers and biomass boilers are generally mentioned in most SEAPs. Measures to the benefit of other stakeholders are related to providing information and support for all kinds of sustainable and renewable energies.

The potential for renewable energy production on the territory of most Flemish companion cities is rather small, since most medium sized cities have a relatively small territory that doesn't allow the installation of big new plants. Cities with undeveloped or abandoned harbor and industrial areas, like Ghent, Antwerp and Genk are the exception in this case.

District heating or heating networks

District heating in Flanders has always been relatively underdeveloped compared to other EU regions. Some cities have small heating networks in place, but currently only a few are operational (in the cities of Ghent, Roeselare and Bruges). Most of them are operating on heat from waste streams.

Currently there is a revival of interest to operate and/or expand the existing networks or develop new district heating systems. Most of the Flemish companion cities have, either with or without cooperation of industrial partners, conducted feasibility studies and are investigating possible development areas/sites. In many cases these efforts are framed within the context of new urban development projects. A general problem for the development of district heating systems is the lack of experience in Belgium, the required cooperation and consent of a large number of actors and the maladjusted or non-existent legislation and market models.

Solar and wind energy

Cities identify stimulation of the installation of PV panels on dwellings, company buildings and their own municipal buildings as important measures. Financial cost-benefit analysis, however, were made when higher policy level subsidies and green electricity certificates for PV panels were highly lucrative. It remains to be seen whether the currently lower financial benefits will reap as much success as some years ago.

For wind energy most cities have developed or are developing wind plans, but the NIMBY syndrome still remains a general problem. Some cities wish to overcome these difficulties by providing opportunities for cooperatives and other forms of local ownership by city stakeholders. For cities in the approach routes of airports there are radar interference problems that currently lead to restrictions on the installation of more wind turbines on their territories, as is the case for the cities of Leuven and Oostende. Antwerp seems to have resolved the issue.

Purchasing of green electricity

Group purchasing of green electricity or in general the stimulation of green electricity purchasing by private families and companies and the purchase of green electricity by the municipal services themselves are identified in the SEAPs as easy-to-implement measures.

While these measures can quickly lower greenhouse gas emissions attributed to electricity consumption within a city they do not really create leverage for the roll-out of renewable energy in Flanders or even at the national scale as the system of certificates of origin allows for the acquisition of renewable energies from abroad, which is widely occurring now.

6 Implementation, city projects and needs

From the above it is clear that cities have set ambitious targets and identified a multitude of possible measures and actions to abate energy consumption and greenhouse gas emissions, and increase the share of renewable energy production and consumption. As mentioned above as well, planning in the climate plans and/or SEAPs is limited to high level planning, only specifying the planned measures with or without specifying the necessary actions and budget to get these implemented either in the short, medium or long term, in particular between now and 2020.

Translation into implementation

The link between the climate plan or SEAP and the effective implementation is in many cases the hardest nut to crack. This step requires a lot of favorable conditions to be shaped, barriers to be removed etc. in order to implement the identified measures and turn them into activities which can effectively bring about the aspired results. The translation of targets into understandable targets for the different stakeholder groups is an important first but difficult step, as many cities have come to realize. What do the general targets mean in terms of actions to be taken up by the different stakeholder groups?

Below we list some important issues to be taken into account for the Flemish companion cities in order to effectively bring about realize and realize city projects. These issues were either identified by the cities themselves or were identified through interviews as issues which crystallized after compiling and interpreting these interviews.

6.1 The municipal services as examples of good practice

Cities clearly want to play an exemplary role towards their citizens and engage in making their buildings more energy efficient, buying green power and developing renewable energy and CHP installations. They reduce the impact of commuter and service traffic by raising awareness among their personnel, investing in clean car fleets and providing the necessary incentives to increase bike and public transport use.

This ambition led to very concrete actions by the cities. Some examples: for the purpose of increasing the amount of renewable energy generated on its territory the city of Hasselt founded an autonomous municipal company in 2012. Ostend is now pioneering to engage in Energy Performance Contracting (EPC) with an ESCO for a large pool of buildings. Many Flemish cities have purchased electric vehicles.

And then again, in some cases short-term considerations still prevail: on the one hand investment in energy efficiency of municipal buildings and public lighting is a measure with clear financial benefits for city budgets in the long term. On the other hand sometimes the surplus upfront investment can still lead to the implementation of less sustainable but cheaper options.

Because these 'internal' projects concern municipal services only, cities are generally well informed and know how to realize these projects. Different city departments with the relevant responsibilities (facility management for buildings, car fleet management, a.o.) take care of the implementation by themselves or cooperate with other city departments, external consultants, ESCOs and other private companies for the operation.

In some cases public opinion can still influence and water down the ambitions. This is the case for PV panels on municipal buildings as this is generally perceived as an antisocial measure because

current legislation stimulates private profit, but only for those who can afford it, while grid costs are incurred upon the society. Wind turbines, for their part, suffer from the NIMBY syndrome.

Except for some examples where short term financial concerns still prevail over long term benefits when decisions are made, investment in these internal-to-the-municipality kind of projects can easily be taken forward as cities are acting for and by themselves.

Successfully starting up projects related to the climate plan and/or SEAP can also help to better integrate the goals and measures of the climate plan and SEAPs in the internal agenda and mindset of the various city departments involved and can lead to a better cooperation between various departments. One of the main challenges for the Flemish cities is to create a sense of ownership of the SEAPs- or climate plan within all city departments.

6.2 Engaging with stakeholders in projects

Compared to the projects undertaken by and for their own services, cities are generally less well informed about, and prepared for, what happens (or doesn't happen) on their territory among citizens and private companies. The city greenhouse gas emission profiles point out that engagement and commitment from the other stakeholders is absolutely crucial to the challenge of reducing energy consumption and greenhouse gas emissions. While citizens and private companies may be undertaking actions which correspond with the city ambitions, cities are not necessarily aware of these actions. However, by combining their efforts they could improve processes or enhance results. A mind shift is needed to help to create co-ownership of these stakeholder projects within the city and its services and vice versa. Any project in line with the SEAP, developed by a city stakeholder should indeed be considered a city project in the broadest sense of the word. In the same perspective, projects enhanced and facilitated on the territory of a city, and which are contributing to the ambitions set out in the SEAP or Climate Plan, are also city projects and stakeholders should be stimulated to claim co-ownership of these projects.

Sometimes city services that are in direct contact with citizens and companies are better informed on specific initiatives from the private sector or citizens by engaging into networks or because they are being faced with stakeholders when the latter encounter problems. But equally, these initiatives may remain less visible for the services which are more concerned with the operational matters of the climate action plan or SEAP. Municipal services concerned with advice on sustainable building techniques, energy efficiency in the built environment, or energy loans get directly in contact with citizens, their desires and the barriers they find along the way for realizing projects. Therefore these entities should work in close cooperation with the city department concerned with the SEAP e.g. the environmental department.

At the same time the city services mainly concerned with the execution of the climate plans or SEAPs have many more problems in finding the right way to engage with stakeholders, either citizens or private companies. Some cities have organized or are organizing broad stakeholder consultation processes to stimulate empowerment of these stakeholders, but many of the Flemish companion cities are still looking for the best ways to increase stakeholder involvement and to create the necessary leverage. New governance approaches and participatory initiatives need to be tested.

Another parallel approach could be to use the specific expertise of citizens and companies and help them realize the projects that align with the ambitions the cities have set. Embracing bottom-up

initiatives has proven to be an important factor to get results faster and deliver them more efficiently. It creates best practice examples, neighborhood-advocates and motivated experienced supporters of the city's plans. Nothing is as counterproductive as the enthusiast who gets demotivated by hitting technical and administrative walls. Providing the necessary playground, creating the framework in which momentarily some rules can be bent to experiment in particular areas, facilitating stakeholder-led initiatives, supporting contacts and the development of projects between different types of stakeholders could be a natural role of cities.

The city of Leuven has now started a process and will develop a working structure to increase ownership of the ambitions among other city stakeholders. This kind of working structure could provide for an ideal playground to develop new approaches to better engage stakeholders. Other cities like Ghent and Antwerp are also experimenting with smart citizen concepts, living labs or new forms of engagement and participation.

6.3 Tertiary sector involvement

As the greenhouse gas emission profiles indicate, the tertiary sector as a part of the built environment is also an important sector to tackle energy consumption and greenhouse gas emissions. While many climate plans or SEAPs have been developed while integrating views of stakeholders from the tertiary sector, it has to be recognized that this is a very diverse sector and that broad representation of this sector is difficult. There is a general need in each of the Flemish companion cities to gain better insight and knowledge on this sector in order to define appropriate measures for its different segments. In many climate plans the list of identified actions related to this sector is very limited and remains general or otherwise only aimed at very specific segments. A diverse sector also means diverse barriers and a diverse set of possible measures to overcome them.

Summarizing, the sector needs to be better involved and more specific data on the different segments and their specific uses of heating and electricity are needed to better identify their appropriate measures.

6.4 Implementation barriers

Who pays what?

In many plans the necessary finances to implement the identified measures are roughly calculated but it is less clear how the necessary funding can be unlocked and which shares will have to be taken up by which stakeholders. This is work that still needs to be done. New financial mechanisms will have to be put in place to mobilize the necessary investments. A focus on other benefits than purely financial or climate benefits could also do part of the job as it would demonstrate cross-overs and benefits on other domains. Co-benefits, so-called not-incurred costs and cross-sector solutions are still underinvestigated.

Additional financial burdens for local governments

When funding is concerned, the Flemish companion cities regret the fact that implementation of policies developed at a higher level in many domains comes down to the city level, increasing the cities' policital responsibilities without an increase of city budgets. In particular it can be noted that at higher policy level the development of SEAPs and baseline emission inventories is being facilitated in Flanders, also for smaller communities. While this evolution can only be applauded, it has to be noticed that once this information becomes available and once these communities start to get involved, many of them will require technical and planning capacities which they now lack

and for which they also lack the necessary financial means. Already the majority of center cities indicate problems with budgetary and capacity demands in terms of personnel.

Other barriers

Many of the plans and follow-up studies demonstrate the financial, environmental and other additional benefits of many measures that are on the SEAP menu of the Flemish companion cities. Still technical, legal and societal barriers exist and hinder or slow down the actual implementation. In some cases governmental issues still put spokes in the wheels and SEAPs become rather a promotional paper than a real reference for things to change. Even when technical, financial and societal barriers are lifted and feasibility is clearly demonstrated the lack of real political commitment might be the hardest bottleneck. Especially this kind of bottleneck can prove to be the most demotivating of all.

The implementation of a SEAP in smaller cities who have just started the process will require a reorganization within city departments with clarity about the mandate of the plan, an integrated approach across city services and with external stakeholders, and enough operational and financial weight and power.

It appears that existing governance, financing and business models are not yet sufficiently suited to allow for the implementation of what is needed. The removal of these barriers and room to experiment should complement enhanced stakeholder engagement approaches.

6.5 Higher level policy

As mentioned above, cities indicate their regret about policy transfers that were not accompanied by budgetary transfers. Apart from this matter, there remain also a lot of necessary actions to be taken for which cities still depend upon the higher policy level.

For the built environment many cities have developed secondary support measures to stimulate the uptake of activities subsidized by either the federal or the regional government. Some cities offer or used to offer additional financial benefits. Especially for energy saving renovation activities, cities heavily depend upon the higher policy levels for financial incentives to their local community.

For new buildings, legal building standards and codes are important higher level policy instruments to stimulate energy efficiency. However, building regulations on energy efficiency and thermal performance only concern new buildings and buildings applying for a renovation building permit. Additional regional policy measures with particular focus on energy saving renovation of the existing dwelling stock might support cities' efforts.

For transport emissions, which are mainly determined by passenger and freight transport by road, cities depend upon the regulations at federal and EU level to increase the environmental performance of these vehicles. As mentioned above, the debate on congestion taxes or on toll for highway traffic passing through is also ongoing on the Flemish governmental level. In a dense urban region as Flanders, with many of the Flemish center cities in immediate proximity of each other, a regional coherent policy is to be preferred above individual city initiatives.

The development of renewable energy is heavily determined by the price of green energy certificates which are regulated at EU and regional level. Another issue, also mentioned above are restrictions on the spatial location of renewable energy plants and in some cases a heavy administrative burden to obtain permits at the higher policy level.

6.6 Monitoring and data availability

Except for the projects run by the municipal services themselves, the effect of other activities undertaken on city territory to reduce energy consumption and greenhouse gas emissions are either unknown or only known to external parties involved. In many cases the effect of these actions only become evident ex-post when consumption data are available.

In other words, cities have difficulties with monitoring both the progress in the field and the effect of secondary policy measures as a result of uptake of the promoted measures by other stakeholders. The first type of monitoring consists of energy consumption or greenhouse gas emissions monitoring tracking the impact of technical measures implemented in the field. Monitoring progress with respect to the baseline requires a.o. the possibility to decouple effects from external effects like annual weather conditions, general economic trends etc. The second type of monitoring implies the monitoring of success ratios of information and support campaigns and other policy measures, in order to evaluate which approaches and incentives work best.

For some measures and activities data is available at other policy levels and with other bodies and not directly available to cities. Information flow from higher policy levels and from energy distributors to the cities could be improved. For the smaller cities even less information is available as they don't have the necessary capacities to collect and process data.

7 Annexes

7.1 Annex 1 - Antwerp, Belgium – 16/06/2013

Interview with Johan De Herdt and Iris Gommers – respectively adviser for Climate and Head of department sustainable city at the Service Energy and Environment
By Dieter Cuypers, VITO

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Klimaatplan Antwerpen	Antwerp	2011	Dutch	Climate Plan on which the SEAP is based
Impactberekening klimaatacties stad Antwerpen	Antwerp	2012	Dutch	In this report the impact of current city policy is assessed wrt the 2020 target.
Emissie-inventaris stad Antwerpen 2010, broeikasgassen	Antwerp	2013	Dutch	This is the latest emission inventory of the city of Antwerp, for the year 2010
Antwerpen, duurzame stad voor iedereen (vanuit de focus energie en milieu)	Antwerp	2011	Dutch	Policy document on the sustainable city, in which the city sets its ambitions from an energy and environment point of view
Duurzaamheid in het beleid van de stad Antwerpen - visienota	Antwerp	2011	Dutch	Vision note from the strategic consultants Rolland Berger
A sustainable Energy Action Plan for the city of Antwerp	Antwerp	2011	English	Short English summary of the SEAP
Terugkoppeling week van de dialoog	Antwerp	2011	Dutch	Overview of the feedback from the consultation among citizens
Actietabellen	Antwerp		Dutch	Action tables to

				manage the progress on different SEAP measure packages
Respect voor A	Antwerp	2012	Dutch	Coalition agreement for the political term

7.2 Annex 2 - Genk, Belgium 29/05/2013

Interview with Anke Cielen, sustainability officer at Service Environment and Sustainable Development

By Dieter Cuypers, VITO

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Opmaak van een CO2-meting voor het grondgebied Genk	Genk	2011	Dutch	This study is the BEI
Actualisatie klimaatplan 2010-2013	Genk	2012	Dutch	Actualization of the climate plan up to 2013.
Klimaatplan Actielijst	Genk	2012	Dutch	Lists the actions per sector between 2008 and 2020 with qualitative planning and reduction estimates.
DuBoscan voor de gemeente Genk	Genk	2012	Dutch	Gives an insight into the possible packages of measures to realize the necessary emission reductions in the residential sector.
HE scan voor de gemeente Genk	Genk	2012	Dutch	Gives an insight into the state, possibilities and possible bottlenecks for

				the development of renewable energy in the city.
Omgevingsanalyse	Genk	2013	Dutch	This document sketches the city based on available data and serves as a basis for the planning for the coming political term of 6 years.

7.3 Annex 3 - Hasselt, Belgium 28/05/2013

Interview with Erica Lemmens and Hilde Pootmans, respectively sustainability officer and environmental officer
By Dieter Cuypers, VITO

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Gemeentelijk klimaatactieplan 2012-2020	Hasselt	2012	Dutch	Climate Action plan with a specific focus on the activities related to the SEAP
Feedback report from the CoMo	Hasselt	2012	English	Feedback report on the submission of the SEAP
Aandachtspunten Energie 2013-2020	Hasselt	2012	Dutch	Document prepared by the Energy Company of the city as input to the new coalition agreement for the political term 2013-2019
Opmaak van een CO2 nulmeting voor het grondgebied van stad Hasselt	Hasselt	2011	Dutch	BEI report

DuBoscan voor de gemeente hasselt	Hasselt	2012	Dutch	Gives an insight into the possible packages of measures to realize the necessary emission reductions in the residential sector.
HE scan voor de gemeente Hasselt	Hasselt	2012	Dutch	Gives an insight into the state, possibilities and possible bottlenecks for the development of renewable energy in the city.

7.4 Annex 4 - Leuven, Belgium 29/05/2013

Interview with Geert Vanhorebeek, sustainability advisor
By Dieter Cuypers, VITO

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Eindrapport Leuven Klimaatneutraal	Leuven	2013	Dutch	The basis for the SEAP, including the BEI and a first selection of possible measures
Oplijsting bestaande initiatieven	Leuven	2013	Dutch	Compilation of existing initiatives in Leuven related to the climate initiative
Bestuursnota 2013-2018	Leuven	2012	Dutch	The coalition agreement for the next political term

7.5 Annex 5 - Mechelen, Belgium 05/06/2013

Interview with Natasha Diericx and Nicole La Iacona, respectively sustainability officer (Service Sustainable Development and Energy) and subsidy advisor (Service Strategy and Development)

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Bestuursakkoord	Mechelen	2012	Dutch	The coalition agreement for the next political term with specific goals improving the city's sustainability
Memorandum Mechelen 2013-2019	Mechelen	2012	Dutch	Input to the new coalition agreement from the city administration and its public center for social welfare

7.6 Annex 6 - Ostend, Belgium 25/06/2013

Interview with Kevin Goes, sustainability officer

Received information

Title of the document	City	Date of publishing/completion	Language of the document	Short explanation
Tussentijds rapport - Opmaak van een CO2 nulmeting en opmaak actieplan duurzame energie stad Oostende	Ostend	2013	Dutch	The basis for the SEAP, including the BEI
Bestuursakkoord	Ostend	2012	Dutch	The coalition agreement for the next political term with specific goals improving the city's

				sustainability
Omgevingsanalyse	Ostend	2012	Dutch	An analysis of the city in 2012 stating the challenges ahead