



## Review of current governance processes of urban and energy planning in Amsterdam/Zaanstad, Berlin, Paris, Stockholm, Vienna, Warsaw and Zagreb (D4.1)

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## INTRODUCTION

The project URBAN LEARNING - Integrative energy planning of urban areas: collective learning for improved governance - gathers eight large cities across Europe, namely Amsterdam/Zaanstad, Berlin, Paris, Stockholm, Vienna, Warsaw and Zagreb, aiming to enhance the capacity of their local authorities on integrative urban energy planning.



Figure 1: URBAN LEARNING cities

The cities respond to new challenges from EU directives, such as the Directive on the Energy Performance of Buildings (EPBD) and Renewable Energies (RES Directive) as well as to changes of technologies and market conditions while facing a lot of pressure to provide sufficient, affordable homes due to considerable population growth.

The focus of the project is put on the administrative processes (“governance processes”) related to the (re-) development of concrete urban development sites. Though some cities already started ambitious urban development projects, the institutionalisation of these experiences is missing. Most cities focus on new development areas and to a lesser extent to the refurbishment and redevelopment of existing areas.

Core of the project is multi-disciplinary learning – concentrating on innovative technological solutions, instruments and tools for addressing energy issues in the context of urban planning as well as on innovative governance elements - and to capitalise this learning to support the institutionalisation of integrative urban energy planning. Backbone of this work are cross-departmental and in some cases also inter-institutional working groups in all cities. More information on: <http://www.urbanlearning.eu/>

This report summarises the first lessons from the task “Analysis of current governance processes”, which is part of work package 4 “Innovative governance solutions for integrative urban energy planning”.

The overall aim of work package 4 is the design of governance processes for integrative urban energy planning and the elaboration of a plan with concrete steps for its implementation, ready to be realised, by

- increasing the understanding on the strengths and deficiencies of the current governance processes with regard to integrating energy aspects,
- increasing the knowledge of how the governance process for integrative urban energy planning should look like and what needs to be changed,
- testing new governance elements as well as new instruments and tools in real time in on-going urban development processes,
- elaborating an implementation plan and get started.

In the context of URBAN LEARNING the „governance processes“ are understood as administrative management processes related to integrative energy planning as part of the design and planning of urban areas, involving various departments of the city administration as well as their respective negotiating and/or contracting parties. “Integrative energy planning” names the integration of energy aspects into the urban design and planning process(es), including energy aspects of supply and demand and involving all relevant parties as early as possible.

In each participating city the project team supported by a Local Working Group analysed its urban planning processes to find out how energy issues are currently dealt with. Furthermore, they analysed important factors influencing these processes either at city level or above (regional or national level). These analyses were summarised in internal working papers (“city reports”) for Amsterdam/Zaanstad, Berlin, Paris, Stockholm, Vienna, Warsaw and Zagreb. Stockholm has also produced a report in Swedish in collaboration with students from the Royal Institute of Technology (KTH).

This report presents the status quo across all cities and for each city as of June 2016. It is based on the city reports, interviews, meetings of the Local Working Groups and beyond as well as on exchanges between the cities. It provides a basis for the next steps towards upgrading of the governance processes where necessary to better integrate energy issues.

## 1. Main findings and conclusions

Energy issues in the context of planning new urban areas mainly relate to the following aspects,

1. the way buildings of the area are defined in terms of volume, surface and use,
2. the way buildings and infrastructure are constructed,
3. the way the constructed buildings/area are supplied with energy, and
4. the way transportation in an area is planned and realised.

While 1. and 4. are current subjects of urban planning processes, 2. is primarily regulated in overarching building codes and less a subject of urban planning and 3. could be a subject of urban planning processes, particularly in grid-connected areas, but in most participating cities this is currently not the case. Discussions about integrating energy and urban planning centre on the 3<sup>rd</sup> aspect, the planning of the energy supply for a (new) area.

The following section summarises the main findings from the analysis of the current governance of urban planning in and across the participating cities in relation to the integration of energy issues.

### Similar in principle planning steps

Overall the principle urban planning steps are similar in the participating cities although there are various local specificities and details. Generally the development of urban areas needs a lot of consultation and negotiation over years. The outcome of this is mostly condensed into an urban master plan or design for an area. These results are then transferred to and determined in the Land Use Plan (Zoning Plan) and/or Building Regulation Plan. This/these binding planning instrument(s) exist(s) in each city on a scale of 1:1000/1:2000, designations for energy supply are nowhere included. Differences in the planning process were identified as follows: in the duration, adaptation procedure of the planning instruments, use of other planning instruments or tools, involvement of districts due to competencies (especially in Berlin where the districts are responsible for the Building Regulation Plan) and the level of public participation.

### Climate change objectives as driver for energy, split responsibilities

Targets for climate protection (most of them recently updated) are the strongest driver to increase energy efficiency and the use of renewable energy sources as avoidance of fossil fuels for heating, mobility and electric applications contributes substantially to the reduction of greenhouse gases (GHG). All participating cities have climate (and energy) targets in place, many of them as part of an overarching strategy.

These energy issues are thus mostly a subtheme of climate protection (mitigation) or sustainability. Hence, the environmental departments are often responsible for related activities like programs for energy efficiency or information campaign to reduce the energy demand. Traditionally energy planning was linked with infrastructure and thus the responsibility for it is often organised separately from energy efficiency and renewable energy issues. Energy planning in this context means all regulations, activities and instruments to steer the energy supply and transformation of the energy sources used. However, at the time of the liberalisation of the European energy markets this responsibility was mostly given away when outsourcing and/or privatising local energy utilities. The only city that currently has defined responsibilities for energy planning is Warsaw, headed by the infrastructure department. Energy planning is predominantly done by network operators and energy providers.

### **Significant indirect impact of urban planning related issues on energy demand**

The way buildings in a new urban area are defined in terms of volume, surface and use and also in the way transportation is foreseen indirectly impacts on the energy demand of buildings and quarters – e.g. denser buildings need less energy, similarly less garage spaces combined with alternative multi-modal mobility offers reduces the energy demand for transportation. In this sense there are a number of important issues that are determined during urban planning processes, which have a direct impact on the demand of energy for heating, cooling, electricity and transportation. As energy aspects they remain rather invisible and thus sometimes unnoticed and therefore also not fully exploited.

### **Lack of consideration of energy supply aspects in planning new urban areas**

Up to now none of the participating cities follows an integrative energy planning approach. That means urban planning and energy (supply) planning are not regularly connected and energy is not an essential part of urban planning. Other issues such as green space or mobility receive more attention in the planning process than energy.

Energy solutions for newly developed areas are decided between energy providers and developers. There is no general steering of centralised energy systems such as district heating by the city (for instance by defining zones) or defining general energy criteria for districts and quarters to ensure long-term sustainability and the transition towards a low-carbon energy system. Possible reasons for this are: lacks in the legal framework that does not support energy as integrative part in urban planning, no responsibility for energy planning within the city (instead it is left to the energy provider (especially due to privatisation)).

Under these circumstances short-term perspectives dominate and current low energy prices combined with high prices for property hinder investments into higher energy standards or increased use of renewable energy sources as they could increase the investment costs, particularly relevant in the segment of social housing. As investors usually do not pay the running costs of buildings they optimise initial investment costs and not life-cycle-costs. This logic favours currently cheap energy supply options and hinders innovative low-carbon solutions with higher upfront cost and lower running costs. In this situation, it is most important to activate private stakeholders and landowners for energy efforts through negotiations, conviction and citizen involvement.

### **Energy criteria at the point of property sale**

Even in situations of lacks in the legal framework a city can require energy criteria beyond existing legislation if the city is the owner of the land on which a new urban area is constructed. Stockholm who owns 70% of the city's land uses this possibility, e.g. for the Stockholm Royal Seaport (SRS) development area. The energy consumption in buildings including heating and cooling, hot water and building electricity should not exceed 55 kwh/m<sup>2</sup> and year, which is now tightened to 50 kwh/m<sup>2</sup> and year. Since 2012 the SRS requirements for energy have been applied to all development projects on land owned by the city of Stockholm, with a lower demand set on the refurbishment of the existing building stock. The steering document for the energy requirements is the Environment Programme for the City of Stockholm from 2012-2019.

In case of public landownership energy criteria related to the energy demand and/or supply of urban quarters could be part of the land sale contracts. Large landowners, as the cities of Stockholm, Paris and Amsterdam, have here an important lever at hand. Still the possibility to introduce or tighten some energy requirements does not automatically imply an integrative process. The energy issue still needs to be addressed in every stage of the development process of a project.

In the case of private landownership, a city can only integrate energy issues in voluntary contracts. This possibility is currently used only in Stockholm. More cities are interested but first need some legal amendments. Energy certification schemes for buildings could help stimulating innovative energy solutions, particularly in the more global market for commercial buildings.

**Room for voluntary initiatives**

There are some voluntary possibilities to integrate energy matters in urban development processes. Some partner cities already have lighthouse projects that include first approaches toward integrative energy planning. A good practice case is the development area Clichy Batignolles in Paris. The following figure shows an overview of the phases for urban development and the orange points indicates where energy could be taken into account. In the preparatory phase (in Paris “Preliminary studies”) an energy assessment of energy needs and scenarios was done. Based on these results, possible energy solutions were identified. Energy objectives like share of renewables for heating were fixed by a development concession contract between the city and the responsible urban developer who was selected in a tendering process. Later in the operational phase these scenarios were further developed by using a multi-criteria analysis grid (as part of the “Feasibility” phase). The input of this assessment provides a basis for energy criteria of land sale contracts as well as for tenders of developer competitions in the implementation phase (see points “Design” and “Delivery”). Finally, there is an energy check of the building permit. Follow-up monitoring is planned. Such lighthouse projects can serve as drivers and urban living labs. Nevertheless they are difficult to replicate due to funding or special interests for an area.

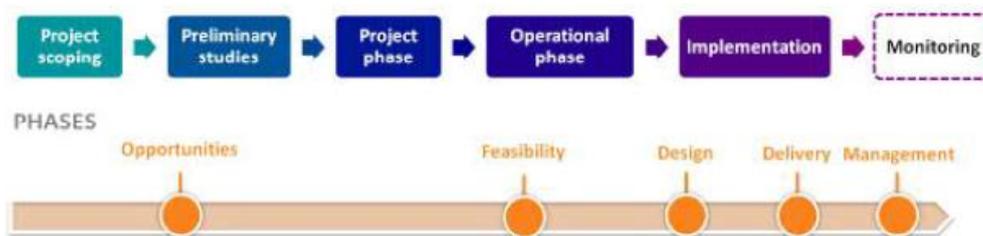


Figure 2: Urban development process and possible integrated energy issues in Paris. Source: City of Paris – Environment department

**Regulatory possibilities are limited**

A lot of relevant regulations are adopted at the national level, for instance energy efficiency laws or regulations for new buildings (energy standards), depending on the legal systems in the countries. In this case the power of cities to change these laws is limited. Still cities can act as frontrunners and influence updates or adaptations of these regulations. In case of standards for new buildings this possibility loses importance as the standard will soon be nearly-zero energy buildings.

**Big difference in possibilities between new areas and areas for refurbishment**

In the project mainly Berlin and to a lesser extent also Zagreb focus on areas for refurbishment. Nevertheless the transformation of the building stock is an important issue in each partner city beyond the project. While the challenge to reduce the energy consumption of existing quarters is much higher than for new buildings, the possibilities to reduce it through urban planning processes are smaller. The main instruments in this case are legal and economic/financial ones. And as the energy supply system is already there, the focus is on the demand side.

Still there is a need and possibility for integrative energy concepts to prioritise and steer the refurbishment of quarters and use incentives for refurbishment wisely.

**Guidelines and tools voluntary and not integrated into the processes**

A further finding was that most cities offer a number of guidelines and tools related to energy issues for builders and developers if they are interested to know more about energy aspects. This could be e.g. guidelines for the installation and use of heat pumps, or cadastres for the potentials of geothermal or solar energy. However, the use of most of those instruments and tools is purely optional and not integrated into the urban planning processes.

## 2. Comparative analysis of cities – similarities and differences

This chapter summarises the findings of the cross-city analyses based on the reports of each city and highlights relevant similarities and differences related to key issues in the context of URBAN LEARNING.

### 2.1. Climate and energy objectives

All cities have defined climate and / or energy-related objectives, which serve as guidance for further programming and subsequent activities. The following table shows the overarching strategy as well as the main climate or energy-related objectives for each participating city.

City	Overarching strategy	Main climate or energy-related objective
<b>Amsterdam</b>	Amsterdam Agenda on Sustainability (2015)	> -40% GHG** (2025) – compared to 1990 > -75% GHG (2040) – compared to 1990 till 2020: > -20% energy consumption per cap > +40.000 dwellings district heating > +18 MW wind power > +151 MW solar power
<b>Zaanstad</b>	Climate Roadmap 2050 Zaanse Energy Agenda 2014-2018 (ZEA)	Climate neutral 2020
<b>Berlin</b>	Berliner Energiewendegesetz (Berlin Energie Transition Act), Integrated Energy and Climate Protection Concept (2016)	Climate neutral till 2050 > -40% GHG (2020) > -60% GHG (2030) > -85% GHG (2050)
<b>Paris</b>	Paris Climate Action Plan (2012)	Factor 4: > -75% GHG (2050) > -25% GHG & Energy (2020) > 25% energy from renewable (2020)
<b>Stockholm</b>	Vision 2040 and related Roadmap 2050 (updating SEAP2020 – 2040)	Fossil fuel free (2040) (= 0,4 t GHG / capita)
<b>Vienna</b>	Smart City Framework Strategy (2014)	till 2050: > - 40% final energy consumption/capita – compared to 2005 > - 80% GHG/capita – compared to 1990 (that's < 1 t GHG/capita, -35%/capita in 2030) > primary energy input 2000 watts/capita > 50% renewables (20% in 2030)
<b>Warsaw</b>	> Strategy of Development 2020 > (SEAP 2020 [2011])*	Objectives from the SEAP till 2020 > -80% GHG (compared to 2007) - binding > -80% energy consumption (compared to 2007) – auxiliary > 20% energy from renewables – auxiliary
<b>Zagreb</b>	> (SEAP 2020 [2010]) *	SEAP till 2020: > -21% GHG (compared to 2008) > 20% energy from renewables

Table 1: Overview on the overarching strategy and the most relevant climate / energy related goals

\* Sustainable Energy Action Plans are not really overarching strategies but closest to it and thus here if the SEAP is the only document which defines climate / energy related main objectives: \*\* GHG = Greenhouse Gas (CO<sub>2</sub> equivalent)

## 2.2. Planning systems

In all cities except Vienna the legal basis for spatial planning (planning law, building code) is at national level. Only Vienna can define regulations and laws (which are on the same legal level as national regulations and laws) because the city has the status of a province (Land) and in Austria spatial planning is the competency of provinces. Berlin is also a province (Land) and can amend national laws with provincial laws. But these laws and regulations are not on the same legal status.

The responsibility for urban planning is in most cities at city level. Only in Berlin and Amsterdam the districts also have a lot of competencies. In Berlin the district planning departments are responsible for the building regulation plan as well as for detailed land use planning. In Amsterdam, there are ongoing changes which will lead to fewer competencies for districts. In the other cities, the districts have an influence on local urban developments and on smaller-scale decisions such as bicycle lanes.

The following table shows an overview of the legal base and responsibilities in urban planning. It should help to understand the different bases for urban planning.

City	Legal basis for spatial (urban) planning and building regulation (laws, regulations)	Level of legal basis	Responsible unit for urban planning
<b>Amsterdam</b>	Spatial planning law, Building regulation => "Space and Environmental law" will replace them as of 2018	<i>national</i>	Department of Physical Planning and Sustainability (part of Cluster Area and Economy)
<b>Zaanstad</b>	Spatial planning law, Building regulation => "Space and Environmental law" will replace them as of 2018	<i>national</i>	Urban development domain (with 2 sectors "Urban development" and "Knowledge and Expertise")
<b>Berlin</b>	Spatial Planning Act - Raumordnungsgesetz (ROG), Federal Land Use Directive - Baunutzungsverordnung (BauNVO), (Building Code – Baugesetzbuch (BauGB))	<i>national, (province)</i>	> City: Senate Department for Urban Development and Environment > Districts: Department for Urban Development
<b>Paris</b>	Urbanism Code Building Code	<i>national</i>	Urbanism Department
<b>Stockholm</b>	Planning and Building Act	<i>national</i>	City Planning Administration
<b>Vienna</b>	Building Code of Vienna (is also the Spatial Planning / Urban Planning Act)	<i>province</i>	Municipal Department for Urban Development and Planning (MA18) & Municipal Department for District Planning and Land Use (MA21)
<b>Warsaw</b>	Law on Spatial Planning and Land Management	<i>national</i>	Architecture and Spatial Planning Department
<b>Zagreb</b>	Physical Planning Act, Building Act	<i>national</i>	City Bureau for Physical Planning & City Office for Strategic Planning and Development of the City

Table 2: Overview of the legal basis and responsibility for urban planning in each city

## Planning instruments and spatial levels

### Strategic urban planning - urban development plan

Each city has an urban development plan (concept) for the whole city. In most cases, it is binding for city administrations but not legally binding for third parties. It regulates land uses (zoning) and city development on a strategic level (as a guiding document). Berlin has both: a guiding urban plan and a binding land use plan for the whole city on a scale about 1:25.000 or 1:50.000. Different is the situation for Zagreb. Besides the strategic document (ZagrebPlan 2015) there exists the Spatial Plan of the City of Zagreb on the scale 1:25.000 (county level), which is a guiding document for the urban part of the city, but mandatory for the non-urban part of the county. The Zagreb General urban plan on a scale 1:5000 for the urban part is at the same time a binding document for a large part of the city (planning instrument on parcel level) and guiding document for the other parts that need a more detailed urban plan (on a scale 1:1000 and 1:2000). Paris is also a special case because the binding urban planning document, the PLU, covers all spatial levels from city to parcel.

### Plans and concepts on borough level (districts, quarters, development areas)

The participating cities have planning concepts for districts or quarters or for special urban development areas. They are non-binding and different even within a city. Usually, it is a master plan or an urban design concept on different scales. Only Paris (as part of the PLU) and Berlin have binding planning instruments at district level.

### Planning instruments at property/parcel level

The building regulation plan (local development plan) regulates exactly the land uses (zones), size, dimension, uses for buildings at property level (or for parcels). It is binding on a scale of 1:1.000 or 1:2.000 and available for the whole city (mostly divided in separated planning documents) except for Zagreb and for Warsaw, where it is not available for the whole city area. Zagreb has a Land Use Plan (General Urban Plan) for the whole urban area on a scale of 1:5000. It designates some areas in which a Building Regulation Plan (urban development plan) on a scale of 1:1000 is compulsory, and for rest of the city General urban plan defines land use and building regulations on parcel level.

The following table gives an overview about the different urban planning instruments according to their spatial level.

City	Guiding urban development instrument(s) at city level	Planning at district / quarter level	Binding instrument(s) in land use planning / at property level (parcels)
<b>Amsterdam</b>	“Structural Vision Amsterdam 2040” (2011) - Urban development concept translated into > midterm strategy “Strategic Plan” (2015) > Investment Agenda “Koers 2025” (2016)	Different concepts for development areas	Bestemmingsplan = land use plan and building regulation plan (scale 1:1.000)
<b>Zaanstad</b>	> Maak Zaanstad > Vision on urban planning (2012-2020) > Vision on housing (2016-2020)	Different concepts for development areas	Bestemmingsplan = land use plan and building regulation plan (scale 1:1.000)

<b>Berlin</b>	> BerlinStrategie 2030 – Urban development concept; > Land Use Plan on city level – Flächennutzungsplan (scale 1:50.000 / 1:25.000) > 6 different thematic Urban Development Plans (scale 1:50.000 / 1:25.000)	District development plans (scale 1:10.000 / 1:5.000)	Districts: Local Development Plans (building regulation plan) – Bebauungsplan (scale 1:1.000)
<b>Paris</b>	PLU – part “presentation report” & “planning and sustainable development plan” & zoning plan (and additional thematic maps) for the whole city (scale 1:25.000)	PLU - “planning and sustainable development plan” and guidelines for each of 22 urban development areas / districts (scale 1:2.000)	PLU – part regulation & maps (scale 1:2.000, down to parcels)
<b>Stockholm</b>	City Plan ‘The walkable city’ = comprehensive plan (2010, under reconsideration)	Different “Structured area plans” for urban development areas (urban design, analysis)	Detailed Plan (building regulation plan, scale 1:1.000)
<b>Vienna</b>	Urban development plan “STEP 2025” (2014) supplemented by thematic concepts	Different concepts for development areas (master plan, urban design)	Land Use and Building Regulation Plan (scale 1:2.000; (“Flächenwidmungs- und Bebauungsplan”))
<b>Warsaw</b>	“Study of conditions and directions of spatial development” (2006)	-	Local Development Plans (land use and building regulation plan, scale 1:1.000, binding but available for one third of the urban area)
<b>Zagreb</b>	> “ZagrebPlan 2015” (Zagreb Development Strategy) – the ZagrebPlan 2020+ is in drafting process > Spatial Plan of the City (scale 1:25.000)	-	General Urban Plan (scale 1:5.000) (Urban development plans [scale 1:1.000/1:2.000])

Table 3: Planning instruments at different spatial levels

### 2.3. Urban planning process(es)

The urban planning processes are in their overall structure to large extent similar in the participating cities. When analysing the processes in the context of URBAN LEARNING, cities have chosen different approaches: Some cities have analysed their whole urban planning processes (from idea till implementation) for urban development areas in detail. This was done either on a general level (Vienna, Paris, Amsterdam/Zaanstad) or for a specific area (Stockholm – Royal seaport area). Other cities focused on a section of the process, namely the formal adaptation of specific planning instruments (Zagreb, Warsaw, Berlin). Berlin, which has its focus on urban renovation, emphasizes the transformation process for refurbishment of the existing building stock in a holistic way.

Regardless of the differences the process(es) can be roughly divided in the following three phases:

- Preparatory planning phase
- Formal planning phase
- Implementation phase

**Preparatory planning phase:** This phase contains all procedures which are not defined by law or other formal regulations and takes place before the formal adaptation of binding urban instruments starts. It is an open, informal phase which can vary significantly within a city depending also on the size of an urban development project.

The planning process starts with an idea / a request for an urban development mostly by private stakeholders (e.g. developer or property owner) or with a political decision by a public institution (mostly the city or city owned companies). Then consultation and negotiation process between the city and the developer begins at that point. Often the discussion starts on a basis of urban assessments or a suitability check. The types of issues analysed depend on the objectives for this area (e.g. sustainable neighbourhood, green city). Energy could be a part of this assessment (e.g. for Clichy-Batignolles in Paris). A first design for this area is either the outcome of an urban competition, a cooperative planning procedure or an urban feasibility study (by the developer or the city). Additional feasibility studies are possible e.g. for energy issues (Paris) or for mobility issues (Vienna). The result of this step is the pre-final design or “master plan” for the urban development area (suggesting densities, structure of the buildings and uses, visual axes, etc.) This constitutes the basis for the adaptation of the planning instruments, e.g. the land use plan as well as permits. In Amsterdam a financial plan is additionally provided.

**Formal planning phase:** If the outcomes (results) of the preparatory phase like urban design or master plan cannot be implemented under the actual designation or zoning, then an adaptation procedure starts. The adaptation affects predominantly the building regulation plan (zoning plan), which regulates also the land uses or zones for each property or parcels. Nevertheless, in some cities also changes of other planning instruments can become necessary (e.g. in Berlin an urban project could lead to the adaptation of the building regulation plan [district] AND part of the land use plan [city]). It depends on the extent of the necessary changes if a small or comprehensive adaptation of the planning instruments is needed. In most of the cities, there is a simplified procedure for small changes to speed up the process. A comprehensive adaptation of the planning instruments takes more time, mostly around 1 to 2 years and needs substantial resources.

The involvement of the public in the preparatory phase and in the formal phase can vary significantly within a city. The minimum would be to the public disclosure of the adapted urban planning instruments like the building regulation plan.

**Implementation phase:** Based on the planning instrument, the city or the developer(s) can carry out a tender for each property. The result is the final design of the buildings and open spaces for each property or parcel. Such competitions can be compulsory, as is the case for social housing in Vienna, or they can be voluntarily carried out by developers / land owners. There could be an additional procedure of reorganising the parcels for all properties before a tender is starting. At the end, the building developer submits the application plan for the building. The building authority checks this plan and issues or rejects the building permit. In some cases, further permits might be necessary before the construction work can start (e.g. for nature protection issues). Normally there is no on-site check during the building phase or after finalisation, except in Zagreb (check of the use permit). In the case of social housing in Vienna, the city controls the progress of the construction almost every month. For energy aspects, the energy performance certificate (EPC), necessary for each new building or major renovations, serves as standard means for quality assurance. However, in most of the countries it is based on asset rating (calculated energy demand), which can differ considerably from actual consumption. Also there are hardly any on-site controls of compliance. Exception: At Stockholm Royal Seaport area also measured energy consumption data have to be provided for the first years of operation.

The following figure gives an overview about the planning phases and their elements. It represents the most common elements and phases for an urban development area and can vary within a city and between cities.

<b>Preparatory phase</b>	<ul style="list-style-type: none"> <li>&gt; Request / idea / initiative</li> <li>&gt; Suitability check</li> <li>&gt; Urban assessments</li> <li>&gt; Feasibility studies</li> <li>&gt; Ongoing negotiations between city and developer</li> <li>&gt; Programme, planning, involvement of the public</li> <li>&gt; Urban competitions, cooperative planning procedures</li> </ul> <p><b><i>Possible results of this phase: master plan, urban design, financial plan, agreements</i></b></p>
<b>Formal planning phase</b>	<p>Adaptation of urban planning instruments (mostly building regulation plan/zoning plan, scale 1:1000, procedure defined by law)</p> <ul style="list-style-type: none"> <li>• draft based on the results of the beginning phase (further feasibility studies possible)</li> <li>• statements of involved stakeholders (at a minimum, other city departments)</li> <li>• further negotiations</li> <li>• final adapted urban planning instrument</li> <li>• involvement of the public (minimum public disclosure)</li> <li>• approval by the city</li> </ul> <p><b><i>Possible results of this phase: adapted and approved urban planning instrument (mostly building regulation plan/ land use plan), urban contracts, further agreements</i></b></p>
<b>Implementation phase</b>	<ul style="list-style-type: none"> <li>(&gt; Reorganising the parcels of each property)</li> <li>&gt; tender for building developer competition</li> <li>&gt; final design of each building</li> <li>&gt; building permit or other permits</li> <li>&gt; coordination with city departments and institutions construction infrastructure (e.g. streets, water supply, ...)</li> <li>&gt; construction work</li> </ul> <p><b><i>Possible results of this phase: final design, permits, constructed building, checks</i></b></p>

Figure 3: The phases and typical elements of the urban planning process

In short the planning processes vary according to the following circumstances:

- Small projects or developments in line with the planning instruments: no need for adaptation
- Check for compatibility with building regulation plan / land use plan – in case of adaptation: small or comprehensive adaptation

- Check for compatibility with planning instruments at higher level – in case of adaptation: small or comprehensive adaptation
- Usage of different non-binding instruments (e.g. urban design, master plan)
- Land ownership (private or public - especially the city)
- Number of involved city departments, public institutions and private stakeholder
- Characteristic of the involvement of the districts
- Urban development project area (possible lighthouse project) or “typical” urban projects
- Level of public participation (e.g. only public disclosure or high involvement like planning cell)

### **Level of integration of energy issues in the urban planning process**

Beyond energy standards at building level, energy is generally not an issue that receives particular attention in the urban planning processes of the participating cities. It has a subordinate importance compared to other issues like green space or mobility. There is no regulation at city level that requires the application of energy criteria such as a threshold to GHG emissions or a share of on-site renewable energy sources for development areas (beyond requirements on individual buildings set by the building codes or incentive programmes). Thus, the described planning instruments do not include energy matters, yet. Normally, the design of an urban development area is decided by the city and/or the developer and, only after this decision the question of energy supply is addressed. At that stage it is (too) late for an optimisation at quarter level and some options particularly for the use of on-site renewables might not be possible any more or would only be possible by reopening the decided design, which prolongs a project and increases costs. The energy supply for a given area is then mostly determined through location (e.g. proximity to existing gas or district heating network) and current cost factors.

However, in lighthouse projects such as Clichy-Batignolles in Paris, Royal seaport development area in Stockholm or Buiksloterham in Amsterdam and Campus Borongaj in Zagreb, energy issues do receive particular attention. Some specific examples are described in chapter 3. They demonstrate how energy aspects could be integrated in each phase. For instance, energy could become part of the assessments and feasibility studies to estimate energy demand and possible energy solutions while regarding potentials for renewable energy sources and waste heat. Furthermore, energy criteria could be a part of tenders, voluntary contracts or agreements. This is especially the case when cities are landowners.

### **2.4. Energy planning**

Besides of urban planning energy planning was also part of the analysis in each participating city. Energy planning in this context means all regulations, activities and instruments to steer the energy supply and transformation of the energy sources used. There is no city with a clear legal competence for energy planning except Warsaw. In addition, only in Vienna there is a dedicated department for energy planning within the city administration. In Zagreb the City Office for Energy, Environment and Sustainable Development can foster energy planning in urban planning process. As a consequence the cities define energy-relevant objectives but partly lack implementing instruments, especially in relation to the supply of energy, more specifically to the supply of heating and cooling.

Energy providers also often follow their own strategies, which are seldom well coordinated with the city. Stockholm and Amsterdam see very little possibility for energy planning due to the privatisation of the energy provider. Other cities have a public energy provider, but the influence of the city on its provider is nevertheless limited as the companies are governed by private law and operate on the open market. The main challenge is the different time horizons between objectives and measures of the energy providers and the developers (property market) and the city. Still, all cities recognise their responsibility and opportunity to steer urban planning much more in the direction of integrated energy planning. Several reasons support

this development including: security of energy supply, costs for energy, climate goals, strong growth of the population, refurbishment of the building stock, growing importance of renewable energy sources and the increasing number of energy producers (especially on small scale).

Warsaw provides the only example of regulations with spatial designation of energy supply and a strong coordination between city and energy providers. This is clearly energy planning but somewhat decoupled from urban planning. Therefore, it can be concluded that none of the participating cities currently practice integrative energy planning.

The basis or framework for energy-related activities differs from climate protection documents and strategic energy documents such as a SEAP (see the following table).

City	Selected instrument(s) for energy issues	(Responsible) unit for energy planning in the city administration
<b>Amsterdam</b>	> Agenda on sustainability (2015)	Department of Physical Planning and Sustainability – Team Sustainability
<b>Zaanstad</b>	> Zaanse Energy Agenda 2014-2018 (ZEA) > Sustainability fund and subsidies (> Platform for marketing renewables)	Team ZEA, Zaanse Energy Agenda
<b>Berlin</b>	> Integrated Energy and Climate Protection Concept (2016) > Berliner Energiewendegesetz (Berlin Energy Transition Act (2016)	Senate Department for Urban Development and the Environment -
<b>Paris</b>	> Climate Action Plan (2012)	Urban Ecology Agency (part of DEVE Environment Department)
<b>Stockholm</b>	> Vision 2040 > Roadmap 2050 (2040, under preparation) > Environmental Program (> SEAP)	Environment Administration, City Executive Administration, (Energy specialists at Energy center support the city administrations, companies and politicians.)
<b>Vienna</b>	> Smart City Framework Strategy > KLIP (Climate Action Programme) II 2020 (2009) = SEAP > SEP 2030 (in draft: thematic concept of the urban development plan for integrative energy planning)	Department for energy planning (MA20)
<b>Warsaw</b>	> Energy Policy 2020 (2006) (> SEAP) > Assumptions for plan of supply with heat, electricity and gas fuels > Plans of supply with heat, electricity and gas fuels	Infrastructure Department
<b>Zagreb</b>	(> SEAP) > EEAP	City Office for Energy, Environment Protection and Sustainable Department

Table 4: Overview about energy related instruments and responsible units

Hence, all cities have a Sustainable Energy Action Plan (SEAP, as part of the Covenant of Mayors) but only three cities (Stockholm, Warsaw, Zagreb) mention the SEAP as a relevant document while the other cities have equivalent strategies that already existed beforehand.

### 3. Main findings in each city

This chapter provides an overview about the planning system and energy planning regulations based on the city reports. It concludes with the main findings for each city. *The text in italic letters is originally taken from the city report.*

#### 3.1. AMSTERDAM/ZAANSTAD

##### 3.1.1. Planning system and planning process(es)

The **Structural Vision Amsterdam 2040** (2011) is the urban development plan of Amsterdam. The **bestemmingsplan** (land-use and building regulation) is the binding implementation of this vision on a small scale (M 1:1.000).

One spatial task of the Structural Vision 2040 is “Converting to sustainable energy”. A midterm strategy “Strategic Plan” (2015) and the investment agenda “Koers 2025” (2016) should ensure the implementation of this vision.

The districts are responsible for small developments, building permits and supervision of the bestemmingsplan. The city is responsible for the big urban development projects.

The urban planning process is defined through the “**PLABERUM: Coat rack for area development**”

- **Exploration:** first feasibility risks and consequences, strategic decision
- **Feasibility:** more details like zoning, accessibility, ... project decision
- **Design:** urban design plan, financial plan, investment decision, bestemmingsplan
- **Implementation:** implementation decisions, building permits



Figure 4: Plaberum – Planning process scheme for Amsterdam and Zaanstad, source: City of Amsterdam

MAAK.Zaanstad (‘Make Zaanstad’ – July 2016) explains the general future vision for Zaanstad in 2040. An important goal is to build some 15.000 – 20.000 houses in the city (and not in periphery/the greens). This means transformation. In 2040, Zaanstad should already be a CO2 neutral city, self-sufficient when it comes to energy. MAAK.Zaanstad demands that all new developments are sustainable (climate neutral as much as possible) and that new dwellings will no longer get connections to the gas network. Electricity and (district – or city) heating will come instead. A separate agenda for investment and execution till 2025 has been drawn up recently (September 2016). One of the main investments is the development of a (regional) heat

network. Through this new policy document, the Zaanse Energie Agenda (ZEA) has become part of the integral policy for city development of MAAK.Zaanstad. Just like in Amsterdam, the land use plan and the building permits are binding when it comes to implementation. In case of development by private parties, the city may work with so called anterior contracts. These may contain targets for energy investments or – use that exceed the common goals given in the Bouwbesluit (resulting in building permits). The planning process (Zaanstad Plaberum) of Zaanstad is very similar to that of Amsterdam.

### 3.1.2. Energy planning

Amsterdam has no integrated energy policy plan or energy planning instruments. Energy and climate objectives are, since 2015, covered by the theme ‘sustainability’. The energy policy is defined through the **Amsterdam agenda on sustainability (2015)**.

One of the four pillars of the Agenda is energy, with the following goals

- 40.000 more dwellings connected to the city heating grid before 2020 (currently 62.000 dwellings are connected)
- 18 MW more wind power before 2020
- 151 MW more solar power before 2020
- Select an area as showcase (**Buiksloterham**)
- Foster energy neutral buildings by selecting developing agencies for 30% on sustainability criteria when the city is landowner.

If the city is the landowner, the EPC for new buildings is 0,15 compared to the 0,4 of the national level.

Zaanstad defined the goals for energy in the Zaanse Energy Agenda 2014-2018 (2014):

In 2018:

- 25% of private houses are insulated
- 100 private houses are energy-neutral
- 
- All big companies realised energy measures with a payback period less than 15 years
- 2.000 houses are connected to a heat network

Zaanstad works closely together with Amsterdam as part of Metropolitan Amsterdam area. One issue of this regional collaboration is to create a regional heat network.

### 3.1.3. Findings

Up to now, energy is not an integrated part of the urban planning processes. Amsterdam is in an experimental phase. In three urban development areas, energy is being paid more than the usual attention to (Centre Island IJburg, Buiksloterham, Houthavens). During the design process for two areas, an energy plan was made (Centre Island IJburg, Houthavens). For the Centre Island the city carries out a tender for energy supply (seeking providers of efficient techniques) based on this energy plan. Buiksloterham should be a showcase area for sustainability, a so-called living lab.

Up till now, in Zaanstad there is no experience with integrated urban-energy planning processes. Energy has been made a special issue in two development areas (Brokking and Hembrugterrein), through non-spatial planning instruments (f.e. anterior contract). Currently (October 2016), anticipating the coming into force of the new national Omgevingsplan, we have been asked to give suggestions in the field of energy for the new land use plan for the City centre.

The big differences of the assessed current and principal energy relevance of the urban planning instruments or elements of the planning processes show a huge potential for Amsterdam and Zaanstad.

*“The cities of Amsterdam and Zaanstad are becoming more involved in the steering on energy, not by prescription but by citizen involvement, market consultation, challenge and negotiation. At the moment this role and the integration with spatial planning is not clearly defined.”*

*“There is a window of opportunity to relate energy planning to spatial planning because of laws and procedures that are being adapted. The Amsterdam/Zaanstad Plaberum, the general process for spatial development projects, will be updated in 2016. On the national level the law on Space and Environment law is prepared and is expected to come into force in 2018.”*

## **3.2. BERLIN**

### **3.2.1. Planning system and planning process(es)**

The SteK BerlinStrategie 2030 is the strategic guiding urban development concept. The Land Use Plan (**FNP, Flächennutzungsplan**) defines the urban guidelines and land uses (down to 3 hectares) on a scale of M 1:25.000 or M 1:50.000. It is the framework for the **District Development Plans** (M 1:5.000 / 1:10.000) and **Land Development Plans** (building regulation plan, M 1:1.000) carried out by the district planning departments. So the districts are the local planning authority. Hence the SteK mentions energy matters as objectives; there is up to now low possibility to integrate energy issues in the urban planning instruments.

Planning process:

Modifications of the Land Use Plan (FNP) were initiated by changes of citywide planning objectives or of local planning concepts. There are around ten modifications of the FNP every year. Increasingly, modifications are processed in parallel with the preparation of Land Development Plan (building regulation plan) for the same areas.

Berlin sets the focus on the building stock. There is a procedure for integrated urban development of “urban renewal areas / funding areas” (Stadtumbau Ost/West). The main issue of the program is about social matters. Just one of the 64 renewal programs regards energy (refurbishment of “Märkisches Viertel”). Nevertheless energy becomes more important.

### **3.2.2. Energy planning**

Berlin should be climate neutral till 2050. To reach this goal the Berlin Energy Transition Act was approved in March 2016 and the Berlin Energy and Climate Protection Concept (BEK) has been drafted. But up to now there is no integrative energy planning procedure or instrument.

### **3.2.3. Findings**

- *“good-practice examples for sustainable energy planning exist in Berlin but institutionalisation is still missing/on low level*
- *further recommendations for effective implementation of energy planning exist through formulations in the “Berlin Energy and Climate Protection Concept”(BEK)*
- *Enforcement of climate protection action through the Berlin Energy Transition Act (2016)*
- *legal framework provides only limited options for energy integration in urban development, especially concerning building stock*
- *existing building stock shows “biggest” challenge to achieve the city-wide objective “Climate-Neutral Berlin 2050”*

- *governance processes and activities can mainly influence public buildings/properties, municipal housing companies, public utilities etc. but further influence on private building owners etc. mainly through consultation and information (also financial incentives through funding, loans etc.)*
- *focussing on quarter level (e.g. Energy Neighbourhood Concepts) is effective to address local stakeholders (building owners, tenants) under consideration of city-wide objectives*
- *political willingness and support on all planning levels is required to promote and implement energy planning*
- *urban development in Berlin as a growing city require very sensitive planning approaches to mitigate and avoid feasible conflicts (e.g. affordable housing vs. energetic refurbishment)”*

### 3.3. PARIS

#### 3.3.1. Planning system and planning process(es)

The **PLU** is an overall planning instrument for all spatial levels from city level down to each parcel (urban development plan, development plan for districts/areas and a land-use / building regulation plan). The PLU defines guidelines and regulations for 22 special development areas called “**Concerted development projects**”. The main objective for each area is a political decision like zero emission area. There are 5 phases of the planning procedure of these areas:

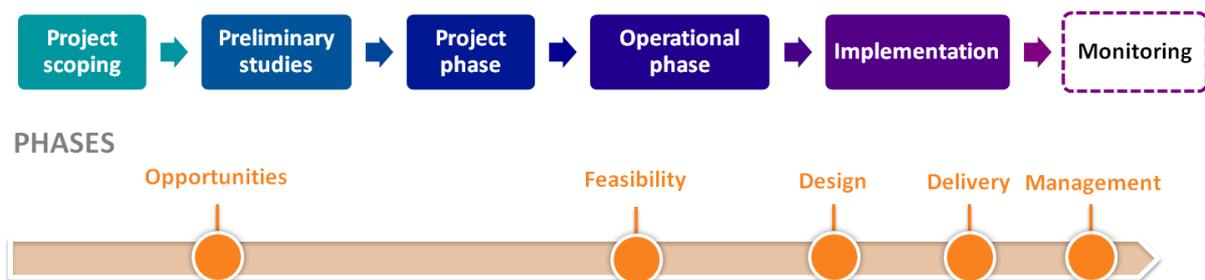


Figure 5: Urban development process and possible integrated energy issues in Paris.  
Source: City of Paris

Each phase combines several steps depending on the situation. A difference to other cities is that during the project stage the city assigns a public or private developer for the urban development of an area.

Paris has a lot of possibilities to integrate energy issues within the planning process. There are 5 key moments for integrating energy (see the five orange points below the phases). Most relevant are “Opportunities” (study about potentials of renewable energy sources, condition of the existing infrastructure, negotiations with energy provider) and “Feasibility” (energy scenarios based on a multi-criteria analysis grid and master plan for this area). They could be connected with an Economic Assessment. But energy criteria have only been regarded in one development area up to now (Clichy-Batignolles). Developers and/or land owners don’t want additional qualities beyond existing regulations, because it has an effect on the price for properties.

Finally the PLU could fix some energy issues:

- Energy efficiency for the new buildings (Building code in France specify maximum energy demand for five uses: heating, hot water, ventilation, cooling and lighting) in kWh/m<sup>2</sup>/yr

- Allow to exceed the maximum height of building to implement solar panels
- Allow a building to overtake on the street in order to fix some insulation structure (20cm)
- Exceeding the FAR (floor area ratio) by up to 20% by the construction of buildings with high energy efficiency standards or facilities for renewable energy production

### 3.3.2. Energy planning

Paris has no energy planning procedure. Nevertheless, it is possible to integrate energy issues in urban development. Furthermore some energy providers have development plans. The most important document for energy issues is at the moment the updated **Climate Action Plan of Paris** (adopted in 2007 and updated in 2012) which leads the City to achieve factor 4 (decrease by 75% of GHG emissions) in 2050. This plan defines energy efficiency standards for buildings (50kWh/m<sup>2</sup>/yr for energy uses: heating, cooling, lighting, hot water, energy system) and urban developments. It describes the main guidelines and is broken down into strategic, functional and operational roadmaps for the different types of stakeholder (Local Authority, Housing, and Economic Activities). Two defined objectives have a strong relevance for urban planning:

- Increasing the energy efficiency of buildings with a target of doubling the rate of refurbishment in the tertiary and tripling in the residential sector,
- The development of district heating supplied by renewable energy and recovery, with an increase of 40% target of the equivalent number of dwellings connected by 2020

### 3.3.3. Findings

*“In a nutshell, Paris has different departments involved in energy planning but none of them has the unique decision-making responsibility. The most relevant would be the environment department. The city of Paris has the intention to create a special energy committee which will be able to make the final decision. This unit will involve several departments of the city.*

*There are many tools and instruments at different scale (national, regional, city) to integrate energy in urban planning in France. Nationally, the energy efficiency law for new construction is quite ambitious (2013); on the other hand the energy efficiency law for refurbishment needs to be updated (2008). Locally, there are two important documents: the local land use plan and the climate action plan. The various elements presented in this document include the diversity of studies, works and possible commitments on energy in urban projects. They come from different urban projects and none to date incorporates all of these elements.*

*In fact, the situation is contrasted and each urban area has its own prerogatives. The energy performance is an important aim for the city, but in competition with other subjects (biodiversity, noise, water, green space, and economic development). So an urban project cannot be successful on all these targets and urban project managers must make choices according to the expectations of the politicians and characteristics of each project. The large variety of technical studies realized at different moments of the project affects the cost of the operation and developers are reluctant to this type of expenditure if it is not mandatory. Similarly, setting commitments on energy has a direct impact on the price of land.*

*There are many guidelines and references to support sustainable development. This is often to implement an environmental management system for the operation, to launch studies, to complete evaluation forms ... But in fact, there is little support for the practical implementation of equipment, technical solutions for energy performance. It must often have a high demand and involvement of politicians so that energy efficiency choices are made.*

*Another possibility is the implementation of a pilot project, an experiment. This type of project benefits from various financial supports (regional, national, European) and combines several technological innovations.*

*Companies are also involved in financing and offer to test new technical solutions they have invented. The problem is that these are one-shot initiatives that may not be technically replicable on other operations. But without funding systems available for pilot operations, it is difficult to replicate this kind of initiative. In most cases, budget constraints make it necessary to reduce the ambitions of the project in compliance with regulations. In this context, from the abundance of existing solutions and exchange between Urban Learning consortium, the goal would be to help define a minimum set of measures for all projects on which to build. Depending on the type, size or ambition of the project, a minimum protocol is defined to achieve for the implementation of an energy efficiency approach in urban projects.”*

### **3.4. STOCKHOLM**

#### **3.4.1. Planning system and planning process(es)**

Under Swedish legislation, energy-related issues are regulated by specific laws – from the overall energy supply for the entire country, to regulations concerning the energy performance of buildings. The laws governing municipal planning are the Swedish Building and Planning Act and the Swedish Environmental Code. These laws contain general formulations only, such as how planning should account for the conservation of energy and other resources. The Building and Planning Act includes regulations, the National Board of Housing, Building and Planning’s (Boverket) Building Regulations, that govern the energy requirements of individual buildings.

Subsequently, legislative support for energy-related issues in planning processes is vague. One alternative is to sign voluntary agreements with property developers and energy companies – or to use “civil law contracts” – such as the land allocation and development agreements - when the City owns the land.

#### **Economic instruments as a policy lever at City level**

The policy in the annual budget provides general focus objectives and more detailed mandates for each administration and company. Based on the budget objectives, each administration and company prepares a business plan which is submitted to their respective committee or board for approval.

In addition to the budget, several focus documents and governing documents exist. The focus documents are mainly used as a policy basis for the annual budget, but also provide administrations and companies with an indication of long-term objectives. The governing documents break down the long-term objectives into annual or multi-year milestones. The governing documents include specific indicators for each administration and company. Performance against the indicators is reported three times per year. The Stockholm Environment and Health Administration has also been assigned to compile two reports per year: One that describes the energy performance and greenhouse gas emissions across the entire geographic area of Stockholm, and one that describes the energy performance of the City’s organisation.

The focus document for energy-related issues is: Vision 2040 – A Stockholm for everyone, Strategy for Fossil-fuel-free Stockholm 2040.

The governing document for energy-related issues is: The City of Stockholm’s Environmental Programme 2016-2019 and The Walkable City – Comprehensive plan for Stockholm.

Some examples of energy-related indicators are: emissions of CO<sub>2</sub>-eq/cap/year, energy (GWh) purchased by the City’s own buildings, annual solar energy production by the City’s own energy facilities, proportion of larger refurbished buildings in the City’s own stock where energy use has decreased by at least 30%.

The City of Stockholm uses land allocation and development agreements with more stringent requirements than the building codes applied in Sweden over the past 20 years.

On 1 July 2012, the development agreement introduced new and tougher requirements for all new development on land owned by the city. Energy consumption is not to exceed 55 kWh/m<sup>2</sup>/year, including heating, ventilation and air conditioning, hot water and building electricity. The results are monitored by the City of Stockholm Development Administration and reported every year in the ILS (an integrated management system), in conjunction with the annual report. The City of Stockholm owns about 70% of all land in the metropolitan area – which explains the major impact of these specifications, because a major proportion of all development in Stockholm is subject to these energy-performance requirements.

### 3.4.2. Energy planning

#### Energy planning across the Stockholm region

Stockholm has an energy plan (2013, according to the energy law introduced in 1977) with very little impact on energy planning and urban planning. Due to privatisation of the district heating system, and liberalisation of the Swedish electricity sector, the City has no legal basis for influencing the energy planning process. However, the new objectives of the overarching “Vision 2040” strategy (fossil-fuel-free by 2040) are providing an incentive to integrate energy-related issues with planning processes. The Roadmap for 2040 outlines the steps that are required to achieve the related objectives. Another key instrument for the City of Stockholm is the “Stockholm Environmental Programme 2016-2019,” which defines the energy objectives as follows:

- *Between 2016-2019, the City shall use energy-efficiency measures to reduce the energy consumption of its own operations by at least 10%.*
- *The energy requirements for new buildings on land owned by the city shall not exceed 55 kWh/m<sup>2</sup>/year (purchased energy). In specific lighthouse projects, opportunities for increasing this requirement will be tested, with a target of 45kWh/m<sup>2</sup>/year.*
- *The city’s own buildings will become 30% more energy efficient through refurbishment (purchased energy) in connection with major renovations*
- *Between 2016-2019, the city shall increase its production of solar power for electricity and heating by 50% compared with 2015.*
- *The city shall strive to reduce its greenhouse gas emissions to a maximum of 2,3 tonnes of CO<sub>2e</sub> per capita by 2020.*

To achieve the objectives of the “Stockholm Environmental Programme 2016-2019,” detailed actions are described and estimated in a section of the “Roadmap for a fossil-fuel-free Stockholm 2040,” where the responsible administrations and companies are also listed.

#### Energy planning for Stockholm Royal Seaport

The development of Stockholm Royal Seaport (SRS) is a lighthouse project, and has served as a role model for sustainable urban planning since its inauguration in 2009. The land in this area is owned by the city, which has enabled the Development Administration to use land-allocation and development agreements containing more stringent requirements than existing building codes. These stringent requirements have already begun to impact projects across the city.

The requirements for SRS are:

- *As of 2010, the amount of purchased energy used by buildings shall not exceed 55 kWh/m<sup>2</sup>/year.*
- *As of 2016, the amount of energy used by buildings for heating, ventilation and air conditioning, hot water and electricity shall not exceed 50 kWh/m<sup>2</sup>/year, net energy needs.*

- *Local renewable generation has been defined as: solar electricity 2 kWh/m<sup>2</sup>/year, or solar heating 6 kWh/m<sup>2</sup>/year*
- *Eco-labelled electricity is to be used for construction and for building electricity for operation.*

### 3.4.3. Findings

The City of Stockholm's systematic approach in the building sector, comprising investments in district heating, conversions from oil heating to geothermal systems, the energy-efficiency improvements of property owners and toughened energy-performance requirements for new buildings, has reduced the sector's energy needs from 10 TWh/year in 2000, to 8 TWh/year in 2015. By switching to more renewable energy sources, greenhouse gas emissions declined from 1.976.000 tonnes of CO<sub>2</sub>e/year in 1990, to 855.000 tonnes in 2015. In tonnes per capita, emissions declined from 3 tonnes CO<sub>2</sub>e/capita in 1990, to 1,3 tonnes CO<sub>2</sub>e/capita in 2015. Despite a growing population, both energy needs and greenhouse gas emissions have been significantly reduced.

At present, 75-80% of the city's heating requirements in buildings are met by district heating, about 20% by geothermal energy or direct electricity. Only a few hundred buildings and about one thousand single-family homes across the entire city have oil-fired boilers.

Swedish society has changed over the past decade, and residents are increasingly able to choose their own service providers. This has also meant that district heating is now exposed to competition from geothermal energy, in particular. To date, relatively few property owners have switched from district heating to geothermal energy, but the city has noted a growing interest from property owners with district heating to replace their heating systems. This is complex from a planning perspective, since district heating requires major investment in the city's power plants and pipeline systems. It should also be noted that increasingly lower energy requirements in new construction leads to higher investment costs for district heating per kWh of energy sold per building.

The City of Stockholm has a long history of energy planning for district heating, in particular, since the companies were previously wholly owned by the city. District heating is now a well-functioning large-scale solution, with a relatively low proportion of fossil fuels (25-30%), but property owners are as stated above tending to move toward a more decentralised market. This presents opportunities for the development of innovative business models based on smart circular system solutions for energy storage and delivery.

The liberalisation of energy markets has reduced the city's opportunities and obligations to impact the planning of energy systems for production and supply. Nor does the city have the jurisdiction to regulate the energy systems chosen by property developers in new construction projects. Furthermore national legislation – such as the energy distribution law – limits opportunities to generate renewable energy for the city and other major property owners.

The remaining options for municipal influence on energy-related issues in planning are to render the systems used by the city's own organisation more efficient, to enable effective solutions linked to voluntary agreements in the planning project's project management, and to increase energy-performance requirements when land owned by the city is being developed. This is also implemented at present by the 55kwh/m<sup>2</sup> requirement, which is one such example of how more stringent requirements than those applicable at national level are applied in land-allocation and development agreements. This requirement alone will not mean that energy-related issues are integrated with planning. To achieve results, the project must also be managed throughout the entire process and the completed buildings must be monitored. The Development Administration has begun monitoring the projects governed by energy-performance requirements. Due to the long timeframe for development projects – about 6,5 years from site allocation until completion – it will take a long time before the city sees the results of this monitoring process.

**Prerequisites for integrated energy planning**

In the City of Stockholm’s organisational structure, the various administrations and their respective committees are divided clearly at administrative and political levels. For this reason, the City of Stockholm’s administrations have been developing internal forms of collaboration for urban planning processes for a long time, in which process tools such as “Ledstången” (the Handrail) are used to define joint processes and responsibilities. This provides an ideal basis for continuing to increase cooperation between the project organisations of the various administrations. Herein lies a major potential for increasing the integration of energy-related issues in planning.

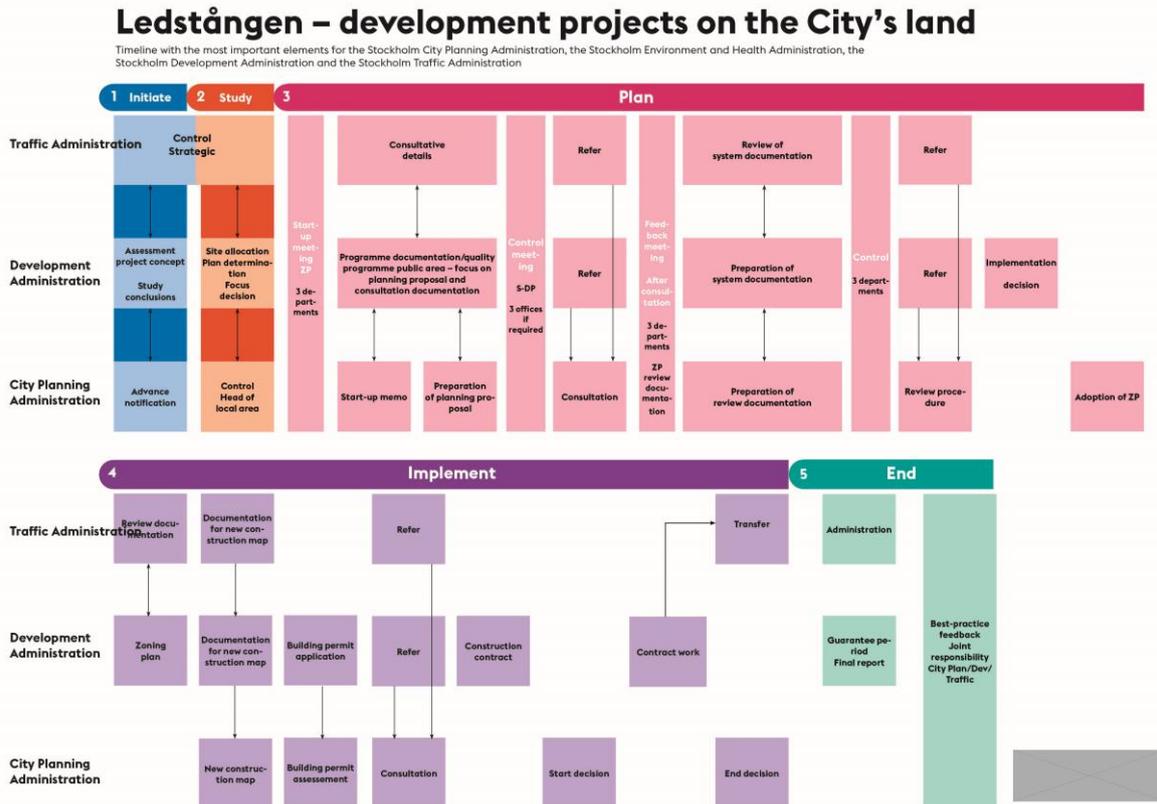


Figure 6: Ledstången – the Handrail of the joint urban development process in Stockholm, Source: City of Stockholm

The urban planning process involves the balancing of public and private interests and, quite often, dealing with goal conflicts. It is therefore vital that the project and planning conditions, both location-specific and political, are clarified at the start of the project, wherever possible, in order to maximise the potential for meeting these goals.

Using these clarified project and planning conditions to create a joint vision for the administrations, and to define each administration’s responsibilities for meeting the goals, is also key to achieving the project’s joint vision.

Equally important for high achievement of the objectives is the political coordination between the administrations’ committees.

Via the Development Administration, the City of Stockholm has four methods for allocating the city’s land to property developers. The four main procedures are direct allocation, direct allocation following a

comparison procedure, price-based tendering and competition. Direct allocation is when a property developer proposes a project and the Development Administration weighs the developer's proposal against the city's requirements on form of tenure, variation and diversity of supply, and how well the property developer meets the city's requirements. The motivation for direct allocation could be design (such as style, innovation, terrain adaptation, parking solutions, berthing, ability to solve noise requirements and other technical solutions). Before allocating a site, the developer's proposal is also assessed by the City Planning Administration's local planning strategist. In addition to governing documents such as the comprehensive plan, current national interests, cultural heritage and natural values including the ecological dispersion relationship, environmental criteria, adopted programmes, relation to existing buildings and ongoing land use, as well as the developer's specific project, the city's rolling local planning forms the basis for the assessment. Local planning enables the city to apply a comprehensive approach to the development and exploitation of larger areas. Thus, proposals for new site allocations on the city's land are always the result of close collaboration between the Development Administration and the City Planning Administration.

When the city wants to meet specific ideas for design or use, competition can be applied. In regard to energy, the Development Administration's land-allocation competitions, with specific requirements on energy performance, can be highlighted as best practice. In addition to the Stockholm Royal Seaport project, the Development Administration has conducted a land-allocation competition where energy performance was one of the qualifying criteria. Experience from both the land-allocation competition and Stockholm Royal Seaport demonstrates the need for clear competition criteria, where the various quality parameters are factored together in the evaluation. Generally speaking, however, analysis of the energy-related issues can be developed in the assessment phase.

The process from an idea for a new area to a completed urban district involves many of the city's parties. When the city owns the land, which is the case for most of the land used for new developments in the city today, the responsibility for project management during the planning process is divided between the Development Administration, in its role as the land owner, and the planning department of the City Planning Administration, which, as the planning regulator, prepares zoning proposals. Zoning is determined at political level by the City Planning Committee or the City Council. When the zoning is finalised, the building permit department of the City Planning Administration tests the building permit applications submitted by property developers against the applicable zoning regulations. During the planning process, the Traffic Administration and the Environment and Health Administration also contribute their expertise on issues related to public spaces and blocks of land. At present, however, the project organisations of the Traffic Administration and the Environment and Health Administration mainly contribute to specific measures during the planning process.

The Development Administration's project managers monitor the project throughout the entire development process, from when land-allocation proposals are submitted to the Development Administration until the project has been implemented and is complete. They are responsible for the requirements specification and contractual issues and, as such, are bound by civil law. This also means that they are freer to enforce municipal and project-specific quality requirements linked to the city's governing documents in plans where the land is owned by the city. The tougher energy-performance requirement of 55kwh/m<sup>2</sup> is one such example.

This energy consumption requirement in the land-allocation agreements for the city's land means that property developers must produce more exact documentation for their energy estimates at earlier stages than would be required at national level. Consequently, the design of buildings during the zoning phase will not deviate from the building permit documents, and the sub-processes of the urban development process (zoning and building permits) will increasingly overlap from the property developer's perspective.

The City Planning Administration's urban planners are unable to regulate energy-related issues in the zoning plans, since their role, as the regulator, requires them to follow the applicable national regulations.

However, the City Planning Administration is responsible for the zoning processes when the underlying project concepts for the site allocations are being developed and realised. The most important decisions in regard to energy consumption are made during the planning process, such as the design and orientation of the block, the area/volume ratio of the buildings, the proportion of south-facing windows, the shadow factors of the block, opportunities to generate local energy, and so forth. There is potential for improvement here.

Another challenge is that the organisation of the City Planning Administration during the urban development process is divided into a planning department and a building permit department, whereby the planning department transfers projects to the building permit department when the zoning has been finalised. Since responsibility is transferred to the building permit department when the zoning has been finalised, there is a risk of information loss, which could have a negative impact on the end product. The building permit department's administrator is then assigned to check the documents that are received to ensure they comply with the zoning plan's objective and framework, and with any development agreements for which the Development Administration is responsible.

### **Proposed improvements to increase the integration of energy-related issues in the various stages of urban planning**

Energy-related issues must be considered jointly by all of the relevant committees and administrations at every stage of the municipal urban development process, by specific mandate from the City Council.

#### *Management*

- A more holistic approach to the coordination of budgets for the various committees and administrations in order to maximise opportunities for creating a joint vision, and to minimise internal goal conflicts.
- Clarification of the hierarchy between various policy documents, in relation to those that are governing documents and those that are guidelines.
- Review of indicators reported in the ILS for each administration.
- Clarification of responsibilities during the urban development process, and the opportunities for each administration to specify requirements.

#### *Comprehensive plan*

- Increased cooperation across municipal borders for coordinating the planning of waste management, fuel and energy storage and energy supply and production.
- A definition of concepts in governing documents to facilitate communication between the various administrations and planning levels, as well as monitoring.

#### *Local planning stage*

- This is the overall informal process of planning to achieve a holistic approach, and to study the planning conditions of an area before zoning is carried out, to secure connections, the need for schools, preschools, sports and other services, and other overriding issues. The City Planning Administration's local planning strategists work in this early, informal stage of the urban development process. It is important to raise knowledge of the planning conditions in various city locations in this stage. Production of maps for early site analyses of conditions for the supply, storage and local production of energy. Early energy estimates are needed to avoid unnecessarily costly solutions. Coordination with private stakeholders to enable the development of smart solutions.

### *Zoning stage*

- Urban planners in the planning department play a dual role in the zoning process: as the regulator, whereby they are subject to the regulations of the Swedish Building and Planning Act, and as a project manager for realisation of the city's vision for the relevant site. In this role, they rarely have their own tools for specifying requirements when the plan has been adopted, and are forced to rely on cooperation with the city's other administrations, particularly the Development Administration.
- The only means available to the planning department for driving quality issues, in addition to the Swedish Building and Planning Act, is to clearly state that the requirements set by the city has to be fulfilled and not produce a plan unless property developers behave as expected. However, as soon as the plan has been adopted, the planning administrator has no impact on the focus of the plan, which opens up for changes being made before applying for the building permit and developing a different type of building. However, this can be regulated by the Development Administration's agreement when the city owns the land.
- One possible means of preventing the property developer from deviating from the agreement during the process would be to coordinate the development agreement with a building permit and the adoption of the zoning plan in such a way that the property developer is unable to purchase the land before the building permit has been granted and the first sod has been turned.
- Greater understanding throughout the zoning process of the impact of energy-related issues on the built environment. The impact of energy consumption and opportunities for local energy production linked to the design of the city and its buildings.
- Requirements for continuous energy estimates throughout the process, including studies of solar radiation, area/volume ratios, shadows etc.

### *Building permit stage*

- Requirements for energy estimates, monitoring and measuring energy-performance requirements and production.

## **3.5. VIENNA**

### **3.5.1. Planning system and planning process(es)**

Vienna is a city and a federal province at once.

In Vienna the legal base for urban planning and buildings is the so-called "Wiener Stadtentwicklungs-, Stadtplanungs- und Baugesetzbuch"; in short "Bauordnung für Wien" or "BO für Wien" or in English in short the **Building Code of Vienna**. It regulates on the one hand building-related matters (defining e.g. the thermal insulation requirements for buildings) and on the other hand it is the spatial planning law (e.g. defining categories of land uses/zoning). It is a provincial law and therefore Vienna, as it is not only a city but also a federal province, has the power to change this law.

Strategically the main guiding instrument for urban development is the **Urban Development Plan 2025 (STEP 2025)**. It was developed in an intensive dialogue process with numerous experts from politics, administration, science, business, and civil society. This plan is supplemented by **thematic concepts**: already available are thematic concepts for mobility (2014), green and open spaces (2014) and high-rise buildings (2014). In addition, there are plans for thematic concepts for public space and for integrated energy and spatial planning (both planned for 2017).

The legally binding instrument for planning is the **Land Use Plan (Zoning Plan) and the Building Regulation Plan**. Both plans are usually combined in one plan with a scale of 1:2000.

Urban planning processes – a short overview: Like in the other participating cities urban planning in Vienna takes place in a preparatory phase, the formal consultation and decision-making resulting in adaptations of the Land Use Plan / Building Regulation Plan (later referred to as ‘Land Use Plan’) and building permit, and an implementation phase. Complex projects often have an intensive preparatory phase, in which a cooperative planning procedure (“Kooperatives Planungsverfahren”) or urban competition (“Städtebaulicher Wettbewerb”) is carried out to develop an urban design, guidelines and/or a master plan. The results constitute the basis for developing a draft of the Land Use Plan (called Green Print), done by the responsible Planning Department. After statements on the draft, an Advisory Board (consisting of independent experts) reviews the adapted draft (called Red Print) and gives recommendations. Following this, the draft is subject to review by the district council and the general public. This input leads to the final update and approval of the Land Use Plan by the city council. The following figure provides a schematic overview of the urban planning procedure in Vienna, which was very helpful for internal discussions and understanding the planning process.

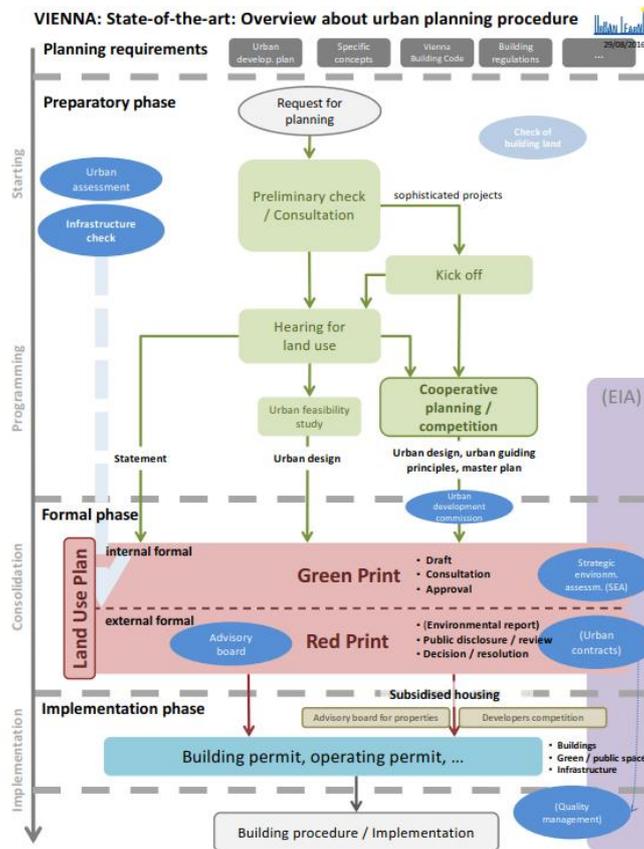


Figure 7: Urban planning scheme in Vienna. Source: City of Vienna

### 3.5.2. Energy planning

At the strategic level, the most important objectives for energy are determined by the Smart City Framework Strategy (2014). Additionally, a more specific energy framework strategy is under preparation. More operationally, the Climate Action Programme 2 (KliP II 2010-2020, which is also the SEAP of Vienna)

and the Vienna Urban Energy Efficiency Programme (SEP) are the key programmes laying down the measures to reach the set energy objectives.

Regarding energy planning, there is currently no dedicated energy planning procedure or instrument in Vienna. Traditionally energy (infrastructure) planning was the task of the energy utility of Vienna, which until 1999 was part of the city administration. With the liberalisation of the electricity and gas markets the utility became a separate legal entity, however still owned by the City of Vienna. As task for the city administration energy planning came back on the agenda in 2010, when the Department for Energy Planning (MA20) was established. This department is involved in the urban planning processes (i.a. by giving its opinion to the draft Land Use Plan) and also has the task to develop an integrated energy and spatial planning concept for the whole city. In addition the department supports first attempts of energy planning in current urban development areas by analysing different solutions for energy supply on a case-by-case basis. It stimulates this development in dialogue with the main public energy provider and building developers to find the best solutions for all stakeholders. The use of on-site resources is supported by GIS based cadastres showing the potential of various renewable energy sources across the city. The planned integrated energy and spatial concept should bring all these elements together and provide basic information on energy sources and functions as partner and supporter for developing energy concepts.

Currently, within or close to the areas where district heating or gas is available, there is predominantly a competition between these two energy carriers. Recent examples such as Viertel2+ indicate that the interest in alternative energy concepts (e.g. using solar energy and heat pumps) is rising, particularly in areas without district heating or gas nearby. Furthermore, using waste heat combined with low-temperature district heating is receiving more attentions.

### 3.5.3. Findings

While energy aspects are well integrated at the level of the building, its explicit consideration beyond the building in urban planning processes is less developed. But due to changing political, economic and technical conditions the need for coordination and planning of the energy supply, particularly of grid-connected energy supply, as municipal task becomes again more apparent. However, for a better integration into urban planning processes the legal basis needs some adaptations.

The existing planning culture using regularly cooperative planning procedures (“Kooperative Planungsverfahren”) and urban competitions (“Städtebauliche Wettbewerbe”) and as well as the possibility to conclude urban contracts (“Städtebauliche Verträge”) which was introduced recently into the Building Code ensure a good involvement of developers and external experts. Especially the latter could also be an interesting opportunity to integrate energy issues. Also the opportunities to involve citizens throughout the process could support this as they represent future tenants, thus future payers of the monthly energy costs.

The Municipal Department for Energy Planning (MA 20) has an increasing importance as a partner within the city administration and for external stakeholders like energy providers or developers. The responsibility to develop an integrated energy and spatial planning concept is an important opportunity to move the agenda forward from singular cases towards a systematic and citywide approach.

### 3.6. WARSAW

#### 3.6.1. Planning system and planning process(es)

The “Study of conditions and directions of spatial development” (approved in 2006) is the urban development plan of Warsaw. It is specified by the binding local land development plans (building regulation plan, M 1:1.000). This latter planning instrument is available for one third of the city and for a further third in preparation. The city does not enforce mandatory the development of local land development plan for each area, even though such plans need to be done in specific cases as defined by the Law on Spatial Planning and Land Management (like in case of landscape protection zones such a plan is particularly needed).

The Study of conditions and directions indicates possible location of main energy investments (e.g. high-voltage grid, larger CHPs and heat plants). The local land development plan establishes the recommended and the allowed method of energy supply.

#### 3.6.2. Energy planning

The Infrastructure Department of the city is responsible for steering energy planning. They provide “**Assumptions for plan of supply** with heat, electricity and gas fuels”, which is an inventory of all energy systems and forecast energy demand for the whole city. This plan specifies the intended energy supply for each area of the city. The energy companies provide also a plan – “Energy company development plan”, in accordance to the national Law on Energy (there are seven large energy companies active in the Warsaw market). The city checks if the plans of the companies are consistent with the Assumptions. In case of differences, the city provides a “Plan of Supply with heat, electricity and gas” for the affected area which should ensure the energy supply and is the basis for investments of the energy infrastructure. Furthermore, the regional government checks whether this plan of supply complies with national energy policy. The following figure shows the procedure of energy planning in Warsaw.

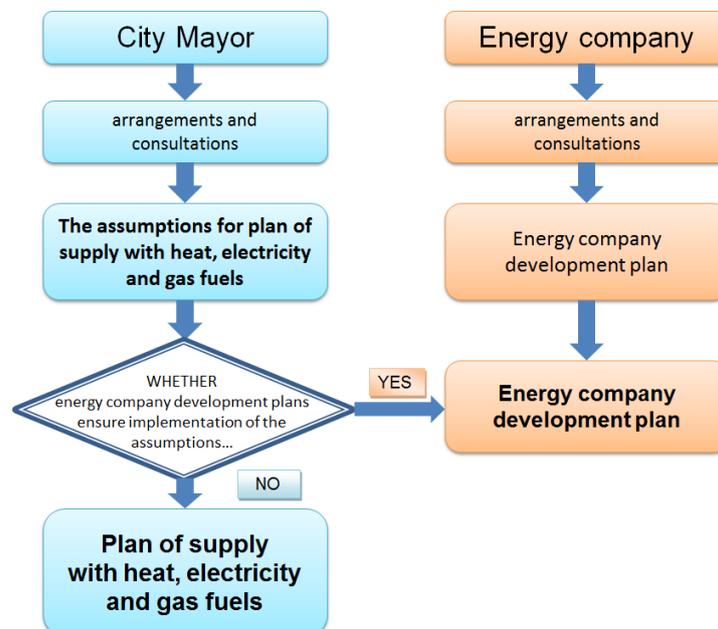


Figure 8: Energy planning scheme in Warsaw. Source: City of Warsaw, Infrastructure department

### 3.6.3. Findings

First, it needs to be stressed that the overall planning system in Polish municipalities – which was only partly described more in detail above – is generally very complex. For instance, the main strategic planning document for Warsaw is the Strategy of Development of the Capital City of Warsaw until Year 2020. Yet it is not a real urban masterplan (there is no such institution in the Polish legal system) – but rather a very general document, constituting the basis for separate sectoral policies, like: Energy Policy of the Capital City of Warsaw until Year 2020; Transportation Policy of the Capital City of Warsaw; or Policy of Development of the Water and Sewage System in Warsaw until Year 2025. In turn, only on the basis of certain sectoral policies, more detailed specific strategies and programmes are created. For example: in accordance with the Energy Policy there was adopted Covenant of Mayors-related Sustainable Energy Action Plan for Warsaw in the perspective of 2020. While in accordance with the Transportation Policy, a Strategy for the Sustainable Development of the Warsaw Transportation System to the Year 2015 and Beyond was created, including a Plan of the Sustainable Development of the Warsaw Public Transportation system.

Another issue are connections and synergies between the different policies and strategies; e.g. the Warsaw SEAP in its transportation-focused part was mainly based on the Strategy for the Sustainable Development of the Warsaw Transportation System.

On the other hand, this planning system is lacking in many areas. Since there is no masterplan to base things on, planning processes in different sectors are less intertwined and coherent with each other than we would like them to be. In theory, spatial planning constitutes a basis for other planning processes – like energy planning – but in practice these procedures to large extent occur separate from one another. Moreover, energy aspects are not sufficiently integrated in spatial planning – and even less integrated in other planning procedures, like transport planning. These factors lead to a situation where energy aspects are often overlooked or underappreciated in the municipal planning, with negative consequences for all groups of stakeholders. Warsaw intends to change this state of things – but it would need, to large extent, further lobbying for appropriate amendments in the national legal provisions regulating planning processes.

Furthermore, even the energy planning by itself is complicated. In Warsaw there are co-existing in parallel: a) “traditional” energy planning documents (The assumptions for plan of supply with heat, electricity and gas fuels and plans of supply with heat, electricity and gas fuels; b) modern documents connected more with climate protection (SEAP and Low-Carbon Economy Plan). Simultaneous managing and updating all these documents require substantial effort. Therefore, the City of Warsaw supports proposals to unify energy and climate planning in Poland.

Taking into account the above, general challenges connected with integrated planning in Warsaw at the current period may be summarized as follows:

- Great complexity and sometimes bureaucracy connected with all planning and programming processes, which are very time-consuming as well;
- Very large number of actors involved, especially inside the city structure; but there are also multiple key stakeholders outside this structure;
- Different planning processes being not sufficiently interconnected and harmonized with each other;
- New legal instruments, even if objectively justified (like Low-Carbon Economy Plans), only add to the complexity since they supplement the already-existing ones instead of replacing them;
- All those issues make it even harder to design/implement innovative and comprehensive projects, like the project of Low-Carbon Area in Warsaw;
- Polish law does not assign to municipalities sufficient competences as to energy-related planning; in practice they cannot introduce obligatory requirements as to energy efficiency of buildings or installing RES.

*Efforts to change this state of things are two-fold: first, by better integrating and coordinating actions on the local level, within the parameters set by the national law; second, by the above-mentioned lobbying for improvement of the national legal provisions. In both these aspects Warsaw intends to utilize results produced within the framework of URBAN LEARNING.*

### **3.7. ZAGREB**

#### **3.7.1. Planning system and planning process(es)**

Zagreb is city and county. The ZagrebPlan 2015 (Zagreb Development Strategy) defines as urban development plan the guidelines of spatial development. The new ZagrebPlan 2020+ is currently drafted.

The Spatial Plan of the City of Zagreb (M 1:25.000) designates the general land use, main infrastructure systems and protection goals. It is available for the whole 640 km<sup>2</sup> of the city county.

The binding General Urban Plan (M 1:5.000) of the City of Zagreb is available only for the urban part of the City (about 220 km<sup>2</sup>) and specifies the land uses of the Spatial Plan as well as the building regulations. Moreover, it defines the locations for city projects as well as other projects with high relevance and designates areas where an Urban Development Plan (UDP) is required. The planning procedure for city projects, for instance public (social) housing projects or refurbishment of old industrial sites, implies other urban rules as defined in the General Urban Plan, but under strict control of the city (City Government and City Assembly). The General Urban Plan regulates also where and when an urban or architectural competition is binding. The Urban Development Plan (UDP, building regulation plan, M 1:1.000/1:2.000), determines details for the implementation such as construction regulations and more detailed land use for unbuilt areas and areas in transformation process.

The procedure of the adaptation of the planning documents is the same for all planning levels, independent of size or complexity (Spatial Plan, General Urban Plan, Urban Plan). There is no simplified procedure in the case of minor adaptations. The urban planning procedure could last from six months in case of Urban Plan adaptations to three years in case of adaptations of the General Urban Plan.

Energy issues are only part of the urban planning process through defining accessibility to the energy grids. Nevertheless the ZagrebPlan 2015 mentioned energy as one of six strategic objectives (linked with environmental protection and sustainability).

It is possible to determine the energy system in the Spatial Plan and General Urban Plan, but more studies regarding energy issues are needed to be binding. The development area Campus Borongaj should be a pilot project regarding the integration of energy issues into the urban development process. An urban competition was carried out pursuing an integrated energy planning approach but the realisation of the project is delayed due to financial and political reasons.

#### **3.7.2. Energy planning**

Energy related content of all planning documents is limited to the accessibility to electric or central heating networks. Two energy plans are defining the long- and medium-term strategy of the city: Sustainable Energy Action Plan (SEAP) and Energy Efficiency Action Plan (EEAP), which can be groundwork for more serious energy planning actions. Urban planning documents mention energy efficient buildings and renewable energy sources as guiding measures.

### 3.7.3. Findings

*While recognised by all relevant actors as intertwined processes, both urban and energy planning are still being done by separate institutions and administrative bodies. Currently, energy aspects are mostly incorporated in the process of urban planning through the question of access to energy infrastructure. The issue of combining energy and spatial planning is partially being tackled via the process of development of ZagrebPlan 2015 (main strategic development planning document).*

The General Urban Plan as the main planning (and binding) document offers the possibility to integrate energy issue. It is important to separate old buildings and parts of the city from the new develop areas. The latter is a very challenging matter because most of the stock is privatised.

## 4. Outlook

While analysing and discussing the current status of governance processes the project team already identified a number of possibilities to integrate energy issues into urban planning. These possibilities are summarised below and serve as a starting point for the next steps about updating the governance processes (especially urban planning processes) (tasks 4.2 to 4.4 of work package 4).

Identified possibilities for integrating energy issues in general are:

- Changing the legal basis: integrating objectives and needed issues in the Planning Act or Building Code or Energy Law
- Tendering: Energy criteria for each tendering (for urban developer, property developer, building developer, concessions, ...)
- Energy indicators for the tasks of the departments (according to an overarching strategy and yearly budget)
- Department, division or team within the planning administration for energy planning (defining responsibility)
- Provide energy data and information by the city
- Provide guidelines and analysis grid for assessing and implementing energy issues
- Connecting energy relevant instruments such as SEAP, EEAP, Climate Action Plans, Environmental Programme, ... and regard urban planning matters in these instruments

Further possibilities for integrating energy issues in urban planning process and instruments:

- Responsible urban planner / urban developer for an area with energy skills and regarding energy issues during the whole process (maybe help by an energy expert)
- City development plan: strategic objectives and measures to regard energy issues for urban development, special aims for certain areas
- Thematic urban development concept for integrative energy planning
- Urban planning concepts for development areas: energy concept, energy analysis as basis
- Building Regulation Plan (land development plan): Integrating energy issues (provide an energy concept and define/designate regulation for the energy system)
- Charter: Integrating in voluntary documents – urban development area charter, environmental charter, building charter, ...
- Development contracts: Between city and developer - defining energy requirements
- Sale agreements / sale contracts: defining energy requirements when selling land owned by the city
- Private developer / land owner: negotiating and convincing
- Lighthouse projects (areas)
- Using energy efficiency labels or certifications for districts, quarters or development areas

In the next step, every city will analyse which of those possibilities are useful for its specific framework and legal situation. It will be a first basis for developing process innovations and testing new governance elements. All proposals will be put together in a kind of “blue print” of upgraded governance processes in the cities (the next deliverable D4.2). In parallel, interesting relevant developments ongoing in each participating city, such as creating an energy unit, updating the urban planning instruments, developing new laws or regulations, using energy scenarios or analysis for development areas, collaborating with energy relevant stakeholder, will be actively followed to already use these windows of opportunities for possible upgrades of the urban planning processes.