Implementation Plans

Executive Summaries

Amsterdam, Amsterdam South East

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December 2014

Amsterdam, Amsterdam South East

This implementation plan (IP) for the area of Amsterdam South East is meant to give insight in the working process as well as the actions about to be taken in this area. The main drive to report in this way is to enable other parties in the field to relate to the Amsterdam –and other TRANSFORM cities- experience. In the scope of the full TRANSFORM program, working on district level is meant as a way to move from planning to implementation and to relate the city's strategy making on Smart Energy topics with contextual specific of the district level. The district level becomes a laboratory for execution of the cities' planning methodologies and goals

The context

Amsterdam South East is mixed area of housing, offices, light industry, medical functions , datacenters and entertainment program. The energy consumption is relatively high: the area consumes app. 10% of the city's consumption and app. 5% of its gas consumption. The size area is app 2.3% of the city surface. The area is developed since 1960's and is strongly densified after the 1990's. The area is home to big comapies like the Amsterdam ArenA, ING bank, ABM bank, ROC education, AMC hospital, IKEA, Equinix, etc.

The ambition

As a guideline to set ambitions for the area the EU 202020 goals are used. Setting area specific goals is in development with local stakeholders. The experience is the the quantitative climate goals are not a usefull instrument for stakeholders to support. In essence the stakeholders in the area much more support the transition towards new economic concepts like the circular and smart economy. Also for each stakeholder, individual drivers –beyond the field of smart energy development- play a big role: financial drivers, visibility/branding, service development, etc. Besides individual goals, stakeholders are aware that collaboration is the way to success.

Way of work

Basically two important ways of work are tested during TRANSFORM:

(1) Bottom up process supported by data. Working in a existing situation with very limited legal power to start transformation processes, means collaborating with local stakeholders. So this was done. The ideas of these stakeholders are related to broad data analyses of energy and waste. This way ideas of stakeholders are linked to possible structural changes in the area. Working this way, helps to set priorities.

(2) Running an area in the 1st stage of plan development
Starting up working on a district level was managed on three levels. First a small process management was installed for 2 years (TRANSFORM period). Secondly, the working on the development process was structured with interventions or feedback moments every half year. This created a continuous workflow Thirdly, project management was organised to develop ideas towards business cases (and possible implementation).

The project portfolio

At the time the work on the area started no collaboration projects existed. In the following years a project portfolio is continuously under development. Five projects groups are defined: energy: retrofit and saving, energy: smart balancing, energy: renewables, mobility, waste , knowledge, innovation, promotion and behaviour. Chapter 7 provides the overview of all projects. Key projects for impact on CO_2 reduction are: using waste heat of the hospital, using local waste to generate (green) gas, retrofit of office buildings and providing sustainable fuels by an orange gas station.

Lessons learned

The Amsterdam approach to the relatively unknown task to set up a (energy) transition in the area of South East is a pragmatic one: learning by doing. Transition in the field of energy, in an existing urban context is complex so failing is inevitable. We experienced in working with stakeholders, always to engage both the operational and the CEO level, right from the start. This will optimize working procedures. A second lesson learn is that projects fail because of uncertainty about future developments. Thirdly, projects ideas stop because after research there is no sound business case. That's part of innovation.

One of the most important success factors is the commitment of local stakeholders. Commitment, strengthen with organisation power –facilitated by the city- brings the potential for transition. Inducing stakeholders can be done in various ways. Bringing business cases to the table or having proven projects in the area is of great help.

Secondly, through Amsterdam Smart City partners like Liander, energy data is available for the city. Data provided new insights and defined the specific challenges for this area. Also, data enable all kinds of parties like consultancy, foreign experts, business partners and students to get active in the area,

Thridly, a success factor was TRANSFORM. TRANSFORM provides the needed extra financial means to be able to test. Also TRANSFORM brings external expertise. They create a sense of urgency, but they also bring in knowledge and widen up the scope of possibilities. Being part of a European programme legitimates the actions in the SUL

Next steps

Thanks to TRANSFORM's contribution, stakeholders are at the verge of defining a structural collaboration till 2020. A public – private partnership to step by step transform the area into a circular economy is under contraction. The expenses of the governance will be paid by the partnership. In project development terms some projects will move to the validation and finance stage, before moving to implementation. Banks are about to join the PPS and the Amsterdam Climate and Energy Fund can support too.

Copenhagen, Nordhavn

This implementation plan gives background information about Copenhagen and the development in the district of Nordhavn so far. The implementation plan focuses on ideas to increase the ability to realize the ambitious goals in the Master Plan from 2008, before the financial crisis, which was a setback for development also in Denmark.

The Transform group has decided to focus on three specific themes – smart buildings, early dialogue with developers and involvement of citizens – and the more general theme of energy to get new ideas, accelerate the process and increase the ability to implement. The aim is that the area will end up being a “state of the art”-district and a testing ground for new solutions.

The vision expressed in the Master Plan for Nordhavn is to create a new sustainable and vibrant city district for everyone. However, the prizes on land in Nordhavn are among the highest in Denmark, which leaves the city and developers with very little space for experimentations and test of new solutions. The variety of housing types is poor at the moment and expensive privately owned apartments dominate.

The City of Copenhagen has an Urban development agreement signed with the land owner, Copenhagen City and Port Development. This Urban development agreement enables the two parties to implement some of the elements in the planning and development of the area that will help meet the level of ambition on the Master Plan from the competition in 2008. In the agreement, the two parties do not commit themselves to different parts of the project that cannot be regulated in the Municipal Plan/zoning and land use) nor the detailed plan for the different parts of Nordhavn. The agreement is a voluntary agreement, whereby the parties agree to work for higher levels of sustainability, for certification, the Energy Partnership for Nordhavn, specific architectural processes for certain plots in the area etc. This is not possible as part of the normal planning procedure in Denmark, so the parties have invented the Urban development Agreement as a specific tool for Nordhavn. The development agreement underpins the specifics of the area and makes it easier to promote to investors and citizen.

One example on involvement of citizen is the architectural competition for the development of Nordhavn. The City of Copenhagen and the landowner Copenhagen City and Port Development hosted a big workshop for citizens and other stakeholders to discuss ideas for the new part of the city. The citizens participated together with other stakeholders such as developers, architects, cyclist union, and local city government representative. More than 800 people participated in the 3 workshops and their ideas were transformed into guiding objectives that formed the building stones in the winning project leading to the master plan.

The main energy supplies to Nordhavn will be in the form of the electricity grid and the district heating network. Electricity is envisioned to play a more important role than presently in Copenhagen, but the efficient Copenhagen district heating system will supply at least the first part of the area with heat.

The buildings in Nordhavn must all comply with the Building Regulation 2020 (BR20) requiring a very low energy consumption, stating a maximum external energy supply (all hot water, heating, cooling and electricity (except lighting) of 20 kWh/m^2/year for dwellings and 25 kWh/m^2/year for businesses. Since hot water and electricity demands typically exceed 20 kWh/m^2/year, this essentially implies that there shall be no space heating demand, unless some energy is produced within the building's premises (e.g. by solar collectors or photovoltaics).

An important part of smart buildings is that their consumption is flexible and that they are able to react to signals both from the house itself but also from the energy systems. The house should then act according to these signals. A smart energy building is thus not only a question of having a low consumption, but also about comfort in the house and increase the overall flexibility for the energy system.

It thus seems reasonable to assume that all heat meters in Nordhavn (all buildings being new) will be electronic on-line meters, since traditional heat cost allocators are too expensive to operative (minimum 4 manual readings per year). Together with on-line electricity metering, which shall be implemented for all consumers before 2020, the heat meters form a sound basis for introducing smarter-than-today energy grids.

In the second phase, corresponding to one local plan area (including Aarhusgade Vest, Trælastholmen and Sundmolen), it has been agreed between the City of Copenhagen and Copenhagen City and Port Development that both the area as such and the

individual buildings must be DGNB-certified. Moreover, developers must participate in the process of dialogue with the City of Copenhagen and Copenhagen City and Port Development on sustainable urban development. The City of Copenhagen welcomes and has great expectations towards the early dialogue with the developers. Normally the City of Copenhagen does not talk with the developers until they have drawn their building and seek permitting to build it. Hopefully this will lead to a more open dialogue about other important issues such as energy supply, use of open space between the buildings not only with the energy provider or municipality but only between developers building in the same area.

From January 2015 a large team of partners including the City of Copenhagen will initiate a new research and demonstration programme “EnergyLab Nordhavn”, with a total budget in excess of 10 million Euros over the next 4 years. The project will focus on Nordhavn and will further research the themes which have been identified at the Intensive Lab session in April. This includes heat infrastructure, electrical infrastructure, heat pumps, smart network technologies, smart buildings, visibility and stakeholder engagement. The project is an innovation project and will demonstrate (test and evaluate) new solutions which can help develop the vision for Nordhavn. A number of specific projects associated with the EnergyLab Nordhavn project are outlined in chapter 4: Implementation measures. Although the project is not directly an outcome of Transform, the Danish Transform partners are involved and will further develop the Nordhavn vision within this project.

Genoa, Mela Verde

Context

The neighbourhood of Voltri is located in the innermost point of the Gulf of Liguria and on the far western suburbs (Municipio VII Ponente) of Genoa, about 17 km from the city center.

The Voltri area has strong historical and cultural identity and in the past they have

played a significant role in the local economy. In 1926, Voltri's autonomy was removed by incorporating it in the city of Genova the economic structure axis rotated and the networks of relationships have focused mainly on the coastal axis resulting imbalance of the ancient links with the city center.

The area addressed by this framework (called "Green Apple", as a result of a previous project, Cat MED) occupies a surface area equal to approx. 30 hectares**, mostly public: RFI (Italian railway Network) areas and buildings, predominately Port Authority land in concession** to associations and operators, private residential buildings located on the margins.

The two main stakeholders (RFI and Port Authority) are very big and powerful and are connected to the urban system in a vast number of issues so the decision on how to develop Green Apple could be influenced by external factors, including also national economic and financial issues.

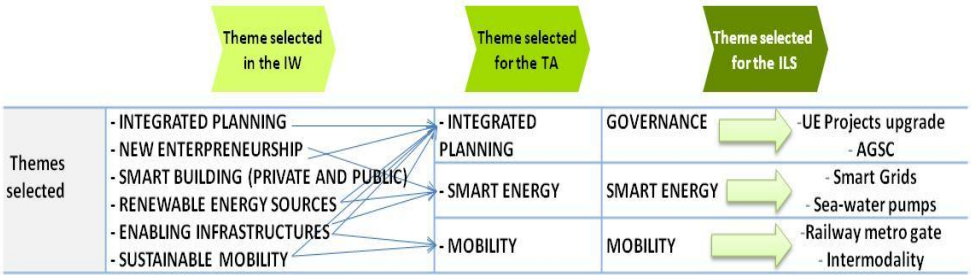
Approach

According to the Transform approach, the Implementation Plan is understood as a strategic document which can be used to support the development of a strategy for an urban area.

In the case of Genoa, due to the early stage of the SUL , the IP aims above all at supporting the promotion of the projects and gathering a sufficient consensus for a

concrete realization. The understanding of the Implementation Plan is closely connected to its embedding in the municipal landscape of programs and strategies, which are variously related to the Smart City conception. In fact, while other cities were thinking about their future and development paradigm concerning smart urban evolution, Genoa chose the way of the building up of a strategic vision by means of an integrated planning, a strong commitment of the City Council around crucial matters of debate and the constitution of an Association (Genoa Smart City association AGSC) in order to set out a process in a coordinated way. AGSC is composed by the Municipality, Enel and University of Genoa as co-founders and about 90 members (enterprises, people associations, territorial and research entities). The challenge for Genoa is trying to decline this concept, referred to the overall city, to one selected small district: Green Apple in Voltri.

Trying to improve the link between strategy (Transformation Agenda) and operations (Implementation Plan), the IP on Green Apple can be defined as a sort of "experimental urban planning tool" which receives the indicatio



ns of the project and tests them in "the middle of the field". How? By means of the **methodological steps built in the city-TransformationAgenda and here purposed again but at the district level.** Following the planning out of the previous paragraphs, the approach towards the T.A. is going to be implemented in Green Apple, at the district scale, with the same tools that we adopted for the whole-city area. Municipality, in the Transform process, try to align the outcomes of the work done on the city with what is under construction for Voltri: within the six themes selected during the Intake Workshop, three main "Green Apple" themes were selected also for the Intensive Lab Session, according to those already decided for the Transformation Agenda. The wished integration among planning visions and tools was considered as the basis-principle of the debate, although it does not contribute directly to the energy efficiency.

Selected key-themes

For assessing the interventions thought for the Green Apple on the selected themes, we can consider CO_2 reducing as a key-target that can contribute to the general achievement of the SEAP city-targets.

★ Energy

The Mela Verde area is served by a gas network and by an electricity network (add features-maps later on). All buildings are heated by either natural gas or diesel. No district heating or energy storages are in place in the area nor significant renewable energy plants. No CHP is present in the area and no waste heat is generated. As far as the SUL is concerned, the only smart grids technology currently in place is the Smart Meter System.

One of the two greatest challenges is **energy saving in buildings**. Given the location of the Mela-Verde area along the coastline, one of the most promising options being proposed and investigated by the Transform project is to improve efficiency and to achieve significant energy (and probably also cost) savings for final consumers by replacing the presently adopted heating systems using fossil fuel boilers (mostly natural gas) by installing and adopting sea-water coupled heat-pump systems. This action will however need to involve citizens and local stakeholders as well as to identify possible financial solutions to promote investments.

The second important challenge is the **retrofitting of public/social buildings** throughout the area (swimming pool, medical practices, library, schools, etc.).

A further challenge derives from the recent flooding events that made the rivers in the area overflow their banks and cover streets with mud. Therefore the implementation of a smart alert system is of primary importance maybe in connection with smart lampposts.

Specifically the basic idea behind this proposal is **to exploit the nearby sea as an enormous heat-source for space heating and any other low-temperature heating purpose (e.g. domestic hot water etc.) as well as for cooling in summer.**

Splitting the intervention into 4 phases of implementation, the expected benefits will be THE REDUCING OF 5586 MWh/year of the energy consumption and 1065 in terms of t CO_2/year.

Another action that was foreseen, related to the energy sector (not precisely calculated yet), is the **replacement of conventional and low-efficient public lightings system with LED technologies,** which will enable energy savings along with the costs reduction related to the maintenance of the system.

★ Mobility

Genoa has about 600,000 inhabitants that lives in 73.53 km^2, representing the 31% of the municipal area. About 302,000 trips are registered during the morning peak hours in the urban territory.

Highway, with its 7 toll gates, is very important in the distribution flows in the urban area: one toll gate “Genova Voltri” is located to the east of the SUL and connects the port (and its trades), too.

The presence of 21 railway stations and the ticket integration between buses and railway carried out the growth of the use of the rail to move within the urban area (along the coastline).

The most relevant infrastructural intervention in Voltri will regard the **railway "metro" station** which will connect the western outskirt of Genoa directly to the centre thanks to a frequent service of small trains, similar to a metro system. **A node with public transport terminal bus** will be realised nearby the new railway station. Moreover the urban mobility plan foresees the realisation of an **interchanging parking**.

The contribution of the Metro Railway system in Voltri and the realization of the related intermodal hub (simulate during the preparation of the SEAP) will be about -772.2 MWh/year and -206.5 t CO_2/year.

★ ICT and smart grids

The main Smart Grids measures that can be planned in Mela Verde are the following: **Electricity Grids preparation and empowerment and Active Demand/Smart Info**. Some **interventions on ICT sector** was foreseen (and calculated) already in 2010 for the preparation of the SEAP and they are now ongoing or completed. The reducing of energy consumption in consequence of Enabling infrastructures’ interventions can estimated in -2222 MWh/year and -555 t CO_2/year.

Conclusions

In the context of Transform Project, **Genoa SUL is an interesting showcase of the preliminary phases in an ambitious urban smart development**, which will help Buddy Cities and others interested in replication better understand the steps to be taken in the process towards a smart district and a smart city.

The present IP offers a matter of debate regarding the crucial question on how downscaling energy planning from the city-wide to the district level, using the Transform approach.

What it came up is a photograph of different colours: from one hand the work already done permit to take into account the complexity of the case, due above all by governance aspects; from the other, such kind of awareness makes the Municipality and the other involved actors conscious of the limits and the gaps of the process so far.

Grand Lyon, Part-Dieu district

The district of the Part-Dieu was designed in the years 1960-70 to be the decision-making center of Lyon and its region. It is at the same time the main business district of the metropolis of Lyon today, and its main front door, by the interchange hub through which the flows of traffic are redistributed on the whole urban area.

Today, to be and remain a business district competitive and recognized in the European landscape, the Part-Dieu district has to increase and diversify its accommodation facilities for a bigger diversity of companies, but also adapt and develop its range of services.

But, to be durably attractive Part-Dieu district also has to propose an urban offer turned to the future needs for the users: a more lively and dynamic district, gathering a bigger diversity of functions and practices. The culture an the leisure activities have to find a more important and visible place, while being mixed in the other activities.

The first objective of the Implementation Plan was to produce an energy diagnosis in GIS format (geographical information system) for the Part-Dieu district on the 3 energy carriers (electricity, gas, district heating and cooling networks to know and measure precisely the district's current energy demand and consumption levels.

The energy diagnosis thus produced is presented in map form and provides the following data: *building typology, heat recovery potential in the Part-Dieu district, consumption by energy carriers, buildings connected to the urban heating and cooling networks, heating and cooling consumption, location of networks: electricity, gas, heating and cooling network, total primary energy consumption, total final energy consumption, energy efficiency of buildings with regard to primary energy, energy efficiency of buildings with regard to final energy.*

At the scale of the Part-Dieu district, the aimed energy objective is to maintain overall energy consumption (for primary energy), despite the planned increase in area in the order of a doubling of the floor space.

To test whether this objective is achievable at the 2030 horizon (date of completion of the urban project), a specific method has been set up.

The method selected consisted of integrating the scheduling in sqm of future buildings to be constructed or refurbished and allocating a forecast consumption figure calculated on the basis of the future use of the building and the performance level it is deemed to achieve by acting on the following orientations: energy performance of buildings' envelop, behaviour of buildings' users and energy carriers used to cover heating and cooling demand.

In conclusion, the objective of maintaining the energy balance of the district is achievable only by combining highly energy efficient buildings (scenario 3) together with a very strong reduction of the specific electricity consumption.

In addition, a 3 day Intensive Lab Session has been held in June to present the first results to local stakeholders and TRANSFORM experts. During this workshop, participants worked very hard to propose comprehensive measures by confronting the local situation with other experiences and innovation developed in other European countries. The intensive lab sessions has been devided on 3 workshops:

(1) Innovative district heating and cooling networks,
(2) Operation/maintenance and awareness-raising of users",
(3) Integrated energy planning.

For the Grand Lyon, this approach allows to:

- ★ know the level of energy performance to reach for new buildings and to rehabilitate and support promoters in the implementation of this objective,
- ★ guide choices regarding the evolution of the respective contribution of the different energy carriers in 2030 (network deployment).
- ★ propose concrete measures to ensure that the urban project can meet its energy performance objectives

At the moment, the following action plan has been set up:

Implementation Plan	Achieved	Ongoing	Foreseen
Energy systems and networks			
Programme approach (changes in the shares of the various energy carriers)		Study in progress	
Pre-sizing subscribed power of all buildings to be constructed and refurbished in P-D by 2030	Achieved		
Technical and economical impact on the electricity grid of the evolution of Part-Dieu district		Study in progress	
Buildings, industry and services – energy demand and energy efficiency The production of a reference framework for environmental issues and for the energy performance of buildings	Achieved		
The constitution of an authority to monitor the environmental aspect of new building projects	Achieved for the 1st buildings	Ongoing for the designing buildings	Foreseen for the next buildings projects
Local renewable energy sources Reflection on the changes to the energy mix of the urban heating and cooling networks		Study in progress	
Mobility Implementation of grips of refills for battery-driven vehicles		Study in progress	
Use of TIC and smart grids			
Study of the cold demand on the district cooling network		Study in progress	
Modelling study of the electrical load curve of the Part-Dieu district		Study in progress	
Study of the flexibility potential on Part-Dieu district		Study in progress	
Reflection on reducing the peak demand on the heating and cooling networks		Study in progress	

Hamburg, Wilhelmsburg

The EU has set ambitious targets until 2020: 20% lower carbon emissions, 20% renewable energy and 20% increase in energy efficiency. Cities play an important role in realising these EU climate goals. The EU project “Transform – Transformation Agenda for low carbon cities” provides insights into smart city processes and methods for cities how to arrive at smart energy plans and projects. Transform provides an integrative approach to a smart city development by using a circular way of thinking.

The work is divided into six work packages, each of these should have a deliverable such as a Transformation Agenda or a Smart City Handbook, at the end of the process. The total outcome of Transform will be used for giving recommendations for the EU Smart City Agenda 2015+.

The implementation plan is part of work package four and is drafted for each Smart Urban Lab (SUL). It shows comprehensively what each city has done and will do to develop smart urban areas in regards to among others stakeholder and investor involvement, linking local development to the city wide strategies and increasing renewable energy. Each SUL is unique thus the implementation plans will differ in their characteristics.

In 2006 the Free and Hanseatic City of Hamburg decided to host the IBA to boost the “Leap across the Elbe” process, which should create new impulses for the Elbe islands Wilhelmsburg and Veddel along with the Hamburg upriver port. The IBA is city owned and was given a budget of 90 Mio. Euros. IBAs are a kind of task force with an exact time limit, namely the presentation year in 2013, and it is structurally separated from “normal” administrative units.

The overall objective for the Elbe island is to become almost 100% renewable until 2050. The aim is to provide exemplary urban responses to the challenges of climate change and to set new standards for the “Metropolis of the future”. In this context it was worked on strategies and projects with the aim to protect the climate focusing on a reduction of green house gasses, energy efficiency and savings as well as promoting renewable energy sources on the one hand (mitigation). On the other hand it was about managing the consequences deriving from climate change (adaptation). All in all every IBA project had to meet the “Climate Protection Concept Renewable

Wilhelmsburg" target, which means that their CO_2 balance should not add to the total emissions on the island.

For the first step to become CO_2 neutral several different RE projects in the IBA area were realised from 2007 to 2013:

- An example for a decentralized district heating grid is the Energy Bunker, a former military bunker of the Second World War. A buffer storage tank holding 2,000 m³ of water was installed in the bunker to take up heat from solar thermal units, waste industrial heat, a wood-chip fired boiler and a biomethane CHP plant. When completed, the energy bunker will supply heating to about 3,000 households and electricity to 1,100 homes.
- The "Energieverbund Wilhelmsburg Mitte" (Integrated Energy Network Wilhelmsburg Central) consists of a number of interconnected power generation plants located in various buildings that form a large "virtual" power station. All nearby residents can feed renewable thermal energy into this thermal grid. A bio-methane-powered CHP plant provides the bulk of the heat supply and also ensures a basic level of service. Solar heat plants located on suitable roofs and facades for example also feed in energy from renewable sources.
- Another iconic technical installation is the Energy Hill. A former toxic landfill was secured, opened to the public and transferred into a place for the production of renewable power. At present a 3.4 MW wind turbine has been installed on the landfill and this, together with another wind turbine and a photovoltaic array covering 1 hectare, generates enough electricity to supply 4,000 households (20% of all households on the Elbe islands).
- Several more buildings, especially the "Smart Material Houses" in the show case houses area of the "Building Exhibition within the Building Exhibition" use their facades and roofs to produce their own heat and electricity.
- Biggest retrofitting project is the "Global Neighborhood" ("Weltquartier") next to the "Energy Bunker" with the energetic refurbishment or demolition and Passive House Standard new construction of 650 residential units.

The status quo for the energy system for 2013 has been assessed by the new work report for the ENERGY ATLAS, which will be published at the beginning of 2015. The conducted monitoring in the context of the research project "EnEff: Stadt" has come to

the results that on balance 35% of households are supplied with locally produced renewable power and about 14% by renewable heat.

After the realization of the International Building Exhibition in 2013, a follow-up organization is using the existing competence and network to develop and market several new development areas within the borders of the exhibition area as well as areas outside the former area (“Elbmosaik”/“Vogelkamp Neugraben”, former barrack area “Röttiger-Kaserne”/“Fischbeker Heidbrook”). In the old exhibition area, the new IBA Hamburg Company is currently in charge to develop three areas (“Georgswerder”, “Dratelnstraße” and “Georg-Wilhelm Heights”) and to continue the analysis of two more potential development areas and their costs and returns (“North South Axis and “Haulander Weg”).

In the frame of the development and marketing of the several areas, the aims of the Climate Protection Concept Renewable Wilhelmsburg and the activities of the Transform Implementation Plan will be considered. Several instruments will be used to ensure the continuation of the work: development of new district heating grids by binding conditions and tender procedures for concessions, concept tender procedures for city owned properties, architecture and project competitions with high standards.

Vienna, aspern_Seestadt

With the transformation of the former airfield of Aspern, the city of Vienna aims for a new quality in urban development, providing a full-range mixed use area which will stimulate neighbouring urban quarters as well as the way urban development in the city of Vienna is being done in general. A main priority in this context is the strive for high quality of life for future residents, combined with affordability. In 2028, 240 ha of land will be developed, some 20,000 people and a similar number of workplaces are hoped to be established in the area by then. The masterplan foresees the development of a multifunctional district with a mix of residential, office, scientific, research and educationnal uses. In line with the Smart City Framework Strategy of Vienna (approved in 2014), the work of the development agency of “aspern_Seestadt”, named “Wien 3420”, has been guided by the vision for an ecological, resource-friendly and climate neutral city from the start of the planning process.

In implementing the first phase of aspern Seestadt, Wien 3420 put innovative measures in place and achieved high quality urban and transport planning as well as the development of attractive public spaces. Striving at high quality planning, best practices may be stated in terms of transport and mobility planning (by various innovative measures, like a new subway line, a mobility fund to finance innovative measures, neighbourhood garages only, inter-modal transport, car-sharing offers, attractive streets for cycling and walking, etc.). Also, developing a lively neighbourhood through quality public spaces, an active neighbourhood management and a special management agency for the public retail streets, supporting local supply.

The realization of more innovative approaches in the sphere of energy was based on the requirements stated in the environmental impact assessment and achieved by private contracts with property developers. So, in the first phase of implementation (aspern_Seestadt South), e.g. higher thermal building standards (as applicable then from building codes), and the obligatory preparation of buildings for solar use and for monitoring were defined. The area is serviced by the municipal district heating system. Finally, the research joint venture “Aspern Smart City Research” between Siemens and municipal institutions performs high level on-site research in the field of local renewable energy sources, demand-side management of energy flows and the provision and management of smart grids.

The aspern_Seestadt IP is covering the second phase of urban development – aspern Seestadt North. Here, for an area designed for 7,000 new apartments and 14,000 jobs, the main challenge is to take the step from researching innovative future energy systems to a complete roll-out in the area. Although considerable potential for the use of renewable sources and innovative systems is shown in various research projects, implementation is still dependent on a large number of actors with conflicting aims. Above all, a fundamental (political) commitment including specific quantitative energy targets is still missing for making aspern_Seestadt a model for new approaches. Thus Wien 3420, although highly interested in developing the area into a full-fledged smart urban district, as a development company is limited by financial and legal restrictions, difficult to overcome.

Furthermore, in the context of the Transform planning process, a more precise description of the future energy system for the SUL is needed – for the 'phase North' EIA compared to the Environmental Impact Assessment Act in 2010 for the 'phase South' area. The EIA-regulations require the determination of one solution for the entire area in advance, which is quite problematic in a fast changing energy environment. Also, in the course of the Transform process it has led to a rather conventional solution for the energy system, laid down in the EIA as a so-called "minimum" scenario. Furthermore, this minimum scenario is setting the framework for the elaboration of more innovative and sustainable system options, since the developer will want to avoid a reopening of the EIA approval process. Nevertheless, based on the ongoing process of elaborating such a 'smart city'-scenario for the energy system, some elements already have been included in the EIA-process in such a way as to which will allow for further innovative improvements without having to go through the approval process once more.

The current state of the IP-related process includes the following elements:

- There is an ongoing process with key stakeholders elaborating a 'smart city scenario' for aspern_Seestadt (phase North), which will possibly lead to an official statement on quantitative targets for the SUL and which will endorse the energy system concept as laid out in the IP.
- The intensive discussions at the Intensive Lab Session of TRANSFORM made clear, that integrated planning and the need for agreements between involved stakeholders have highest priority for smart city implementation, in aspern_Seestadt and elsewhere in the city. Intensive work has been started by the relevant

municipal departments in order to develop new procedures of integrated energy and urban development planning in Vienna.

- The key issue of financing is currently tackled by an in depth analysis and comparison of finance and business models for aspern_Seestadt.

These activities, strongly supported through the TRANSFORM process, will hopefully provide most valuable decision support for the key actors in Vienna. Helping to define tangible requirements for development in aspern_Seestadt, to provide the chance of becoming a model for 'smart city' development and – at the same time – to leave enough openness and flexibility for new framework conditions and technologies in the coming 15 years of implementation.