POCACITO

european post-carbon cities of tomorrow

POLICY RECOMMENDATIONS

CEPS

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I INTRODUCTION

The aim of the POCACITO project is to facilitate the transition of European cities towards a post- carbon future by defining a roadmap for this transition. The project focuses on towns, cities, megacities, metropolitan areas and urban clusters larger than 1 million people as well as small and medium-sized cities. At the core of the project is a series of participatory stakeholder workshops held in each of the case study cities: Barcelona, Malmö, Istanbul, Lisbon, Litomeriče, Milan/Turin, Rostock, and Zagreb. The purpose of these workshops was to bring together local stakeholders to define a common post-carbon vision for 2050, and to outline an action plan guiding the path towards achieving this vision.

This document presents the results from the city case study and the Roadmap reports. The document is structured as follows: Section II presents the process by which the recommendations have been produced in the case study cities through a visioning and back-casting approach and how those have been used to develop the roadmap. The POCACITO case study cities are: **Barcelona, Istanbul, Lisbon, Litomeriče, Malmö, Milan, Rostock, Turin and Zagreb**.

A large number of stakeholders contributed to these recommendations at the local level in the case study cities as well as at the European level, including among other the POCACITO advisory board.

Section III presents the recommendations on the use of visioning and back-casting at the city level. Section IV presents recommendations for city authorities. Section V presents key recommendations for national and EU policy-makers.

The specific recommendations for each case study city are presented in the annex due to the large amount of information, including milestones, actions and needs assessments.

II TYPES OF RECOMMENDATIONS PRODUCED

The POCACITO process has produced three kinds of recommendations. First, the case study cities produced city strategy documents, which are collected and presented in deliverable D 7.2 “Collated strategy papers”[1]. The results fed into a Roadmap group, which discussed the actions needed at national and European level, as well as offering recommendations on the way to perform such consultation processes. The Roadmap is the deliverable D 7.3. The Roadmap recommendations are reproduced in sections IV, V and VI.

[1] http://pocacito.eu/sites/default/files/D%207.2%20collated_strategy_papers_0.pdf

II.I CITY RECOMMENDATIONS

The recommendations for each city are presented in the annex. Each city has produced a list of milestones and actions to be undertaken to reach the 2050 post carbon city objectives. The milestones and actions the cities recommend are presented in the Annex to this document. The recommendations accelerate the movement towards a post-carbon city, however, in general, the strategies don't yield changes that are strong enough to achieve a zero emissions level. The specific recommendations of local stakeholders in each city are presented in the annex.

The strategies were analysed to prepare a set of general recommendations for city authorities, national governments and the European Commission in a separate roadmap stakeholder group, which is presented next.

II.II ROADMAP PROCESS AND DEVELOPMENT OF OVERALL RECOMMENDATIONS

The roadmap for European post-carbon cities[2] highlights how the EU can create an enabling framework for actions fostering the transition of cities towards a post-carbon future. The draft was developed on the basis of discussions at an EU-level workshop exploring options for possible support from the EU and member states, then further refined in several groups of stakeholders at a final project conference in Brussels. The POCACITO conference took place on 21 October 2016 at CEPS and brought together over 80 stakeholders to finalise the policy recommendations.[3]

The Roadmap stakeholder group was created with specialists from different backgrounds in the area of urban transformation, ranging from city authorities from non-participating cities to academic experts, in addition to the stakeholders from the POCACITO case study cities. The full list of stakeholders from the case study cities can be found in D4.2 "Report on Stakeholder Workshops"[4]. In addition, the group included several EU-level experts. The objective was to distil the recommendations from cities into higher level key messages and recommendations. The lessons and recommendations need not to be based on the outcome of the case study cities alone.

The group met several times in person and by teleconference to discuss the document. Allowing for constant input and review by the members. The draft text was also presented at the final conference. The conference was designed to present the highlights of the project and to be participatory. Participants not only were able to engage with project partners and fellow urban experts, but also reviewed the Roadmap document's recommendations, commented on it and contributed through a collaborative setting, which allowed participants to discuss the recommendations in groups.

[2] The roadmap is deliverable D 7.3 "POCACITO ROADMAP – A POLICY FRAMEWORK FOR POST-CARBON CITIES" http://pocacito.eu/sites/default/files/D7_3_EU%202050%20Roadmap%20for%20post-carbon%20cities_0.pdf

[3] http://pocacito.eu/blog/2016-12-20/proceedings-pocacito-final-conference

[4] http://pocacito.eu/sites/default/files/D4_2_Report_on_Stakeholder_Workshops_rev-final_0.pdf

III RECOMMENDATIONS ON THE USE OF VISIONING AND BACKCASTING

POCACITO has proven the potential of the visioning and back-casting process to develop realistic and socially inclusive strategies. Effective solutions need the support and understanding of citizens and public awareness about the advantages of a transition towards post carbon cities are of paramount importance for the implementation of all strategies. Stakeholder behaviour is an important part of the effectiveness of any sustainability changes in cities. Lasting and solid change can only be achieved with a certain level of awareness in society.

The visioning and back-casting exercises are powerful tools to engage stakeholders and increase their awareness and participation in the steps towards a post carbon future. The Roadmap presents following recommendations on the process (The recommendations have been shortened in this document):

Key lesson 1: Visioning and back-casting exercises are highly successful in raising awareness of the need to act today.

POCACITO brings together stakeholders from very different social backgrounds and sectors in the economy, increasing the awareness of participants of the variety of options (visions) for the future. It makes stakeholders understand the perspectives of other citizens, while confronting their own views with actual data. They soon learn to make the link with the future.

The back-casting exercises have to be adapted to the types of stakeholders (from local authorities to representatives of different groups in societies) and to local customs.

Key lesson 2: Visioning and back-casting increases stakeholders' understanding of the diverging long-term views of other citizens, helping to build consensus on long-term objectives.

POCACITO aims to bring minds together for greater consensus on the vision and development path to be undertaken. Asking participants to identify integrated approaches to city development and to give an indication of the when, the how and the who of actions to be taken, increases participants' awareness of diverging views and needs, which they were not previously considering. Bringing them together facilitates the development of a coherent and inclusive strategy.

Key lesson 3: The stakeholders involved in the consultation process need to represent the heterogeneity of views of all social groups and socio-economic actors in the city.

The composition of stakeholder groups in the case study cities have affected the kind of solutions proposed. Without a representative mix, the strategy will be affected by particular interests.

Key lesson 4: A quantitative analysis can verify the impact of stakeholders' decisions on decarbonisation. If the actions are too weak, quantitative studies can be used to encourage further action by the stakeholders.

The back-casting exercise should be complemented by an analysis of whether the actions proposed are sufficient to reach specific objectives, such as decarbonisation targets. This can help sharpening the strategy, but also increase the awareness of stakeholders.

Key lesson 5: The moderator of the Workshops on back-casting and visioning needs to ensure that the discussions will not become solely a debate on present malfunctions in the city.

Visioning requires participants to develop a vision of what the city should be in 2050 according to a common vision, not on what problems exist today. A focus on today's problems hampers "off the hat" thinking and finding new avenues.

Key lesson 6: Visioning and back-casting facilitates the task of identifying the necessary regulatory and financial conditions that would enable the city to change.

While the POCACITO vision and back-casting process helped stakeholders to understand the challenges ahead and encourage them to take action, it also revealed the dependence of cities on the enabling legal and economic framework of the country in which they are located.

Key lesson 7: Good analytical support and possibly the use of city modelling tools are needed to help the stakeholder see how their ideas impact the future, to test their ideas.

For stakeholders to understand the value of their proposals, a modelling capacity is needed to support the back-casting exercise, sharpening their knowledge of the city and their awareness of the needed steps.

Key lesson 8: Visioning and back-casting exercises need the support of the local authorities and of city associations.

The results of the exercises can only have influence if the city authorities are fully committed to this work.

IV FINAL RECOOMENDATIONS FOR CITY POLICY MAKERS

For city policy makers, the Roadmap presented the following recommendations:

Key recommendation 1: Cities need to have an integrated approach to city management and planning, in line with long-term objectives.

To achieve socially, economically and resource-efficient sustainable cities, the local public authorities need to operate in an integrated fashion, i.e. promote policy integration of post-carbon issues, as well as include relevant actors at the different stages of policy-making and implementation. Efficient city governance can only be achieved if all sectoral parts of city services and administration work together.

Key recommendation 2: Apply a stakeholder-driven visioning and back-casting process when designing strategies for the city. This will increase the acceptance and understanding of city stakeholders about necessary changes.

The administrators managing city services and citizens need to be conscious of the impacts of their daily activities, beyond their private sphere and their own costs and benefits. They should integrate in their planning and actions social and environmental costs and benefits of their activities. This can only be achieved if stakeholders involved are made aware of the needs of various citizen groups, the role of businesses, and the requirements in main sectors to reach a post-carbon future.

Key recommendation 3: Support for capacity building should be provided. This could be done through initiatives such as the Covenant of Mayors. A database of global best practices should be set up.

The process of decarbonisation and adaptation to climate change is far from being understood by all city authorities and stakeholders. There is a need to increase the local capacity to develop mitigation and adaptation strategies. This can be done through mechanisms such as city networks, e.g. the Covenant of Mayors for Climate and Energy[5], ICLEI – Local Governments for Sustainability, or through more formalised collaborations between cities in Europe. In addition to these initiatives, the EU also has the Climate-ADAPT European Climate Adaptation Platform, which encourages cities to collaborate on climate adaptation and offers the information and tools to understand their exposure to climate change.

The European Commission should also provide an EU level database with best practices to help in increasing knowledge and exchanging best practices in developing post-carbon cities.

[5] www.covenantofmayors.eu/index_en.html

Key recommendation 4: Education and awareness rising is essential

Training and education, as well as awareness raising of the potential benefits and costs of action and inaction through exercises such as the POCACITO stakeholder consultation, are important pillars to build on a more sustainable future.

To promote post-carbon transitions, education about the environment, climate change, circular economy, recycling, resource efficiency, social inclusive and equitable transitions and costs of externalities should be integrated into primary, secondary school and university curricula.

Key recommendation 5: City infrastructures and services need to be open, inclusive and affordable for citizens.

Strategies for cities have to be realistic and socially inclusive. New technologies and services not only need to be effective but also ultimately available for cities to use.

Key recommendation 6: Cities need to be rethought and 're-naturalised', with a focus on 'mobility', which is a concept that goes well beyond just transport.

Cities need to be re-planned into functional districts better integrated with nature to increase air quality, improve liveability and reduce issues such as 'heat islands'. Functional districts need to offer proximity to private and public services to increase accessibility and to improve citizens' 'mobility' in a wider sense; with an ageing population, this becomes even more important. Localisation, in fact, reduces the need for transport while it expands accessibility, i.e. the ability of citizens to access the different functions. Such multi-functional urban areas increase the attractiveness of the city, including for families and high-skilled labour force, as well as for businesses, such as international companies but also more local business.

V RECOMMENDATIONS FOR NATIONAL AND EUROPEAN AUTHORITIES

Key recommendation 1: National, EU and even global strategies need to be drafted with representatives of cities.

City stakeholders from the POCACITO process have identified the areas where European and national policy actors need to act, in order to facilitate cities' decarbonisation actions. Cities should be involved in the UN, EU and national level decisions.

Key recommendation 2: The European Union should support the process of reallocating competences in line with challenges facing cities, thus in line with the subsidiarity principle.

There is a need for an immediate review of regulatory and fiscal power distribution at different levels of governance to ensure an efficient balance of powers that supports cities to develop tailored strategies to reach post-carbon objectives.

Key recommendation 3: The EU should provide clearer and more stringent requirements for energy efficiency while furthering the implementation of circular economy action.

The European Commission should revise directives (such as the Energy Efficiency Directive) to better guide cities in implementing actions. There is also need for stronger actions in promoting the move towards a *Circular economy*, i.e. a development cycle that preserves and enhances natural capital, optimises resource yields, and minimises system risks by managing finite stocks and renewable flows.

Key recommendation 4: Good statistics at city level are required to be able to analyse the needs and benchmark cities.

To develop long-term strategies and monitor impacts of measures for long-term goals reliable city-level data is needed, with standardised definitions of the indicators across the EU. Eurostat should, given the growing importance of cities, develop an integrated database specifically dedicated to cities.

Key recommendation 5: More research on the interplay between climate, energy policies and local development and easier funding rules to research projects for smaller-sized cities.

There is a need for increased research efforts on territorial economics and the link between climate, energy policies and local development at the city level.

ANNEX. CITY-SPECIFIC RECOMMENDATIONS

This annex presents the recommendations of the local stakeholders of the case study cities in their city strategy documents which are derived from deliverable D 7.4. "Collated strategy papers"[6]. In the case of Rostock, the tables originate from the workshop report[7], as the strategy document was produced in German:

- Barcelona - Milestones, actions and needs assessment
- Istanbul - Milestones, actions and needs assessment
- Lisbon – Milestones, actions and needs assessment
- Litomerice – Milestones, actions and needs assessment
- Malmö – Milestones, actions and needs assessment
- Milan – Milestones, actions and needs assessment
- Rostock – Milestones, actions and needs assessment
- Turin – Milestones, actions and needs assessment
- Zagreb – Milestones, actions and needs assessment

[6] http://pocacito.eu/sites/default/files/D%207.2%20collated_strategy_papers_0.pdf

[7] http://pocacito.eu/sites/default/files/workshop_reports/Rostock_Workshop_Report.pdf

BARCELONA - MILESTONES, ACTIONS AND NEEDS ASSESSMENT

The participants had to transform their visions, objectives and problems into milestones for the city and then identify the actions to make them reality in a clear timeline.

Many of the milestones and actions were considered to be needed in the short term. Many practical barriers require removing to be able to achieve longer term goals. **Error! Reference source not found.** below shows the time on the left side to achieve specific milestones. Those for 2050 are generally final full changes that require constant adaptation from now. The two right columns show what specific actions need to be undertaken to achieve the milestone and when this change could be "realistically" implemented.

The table is divided in colour coded categories of objectives to achieve:

a) Local transversal coordinated public management
b) High level of knowledge, awareness and information
c) Implementing green and sustainable citizen driven growth model
d) Developing green energy system and a clean low carbon circular economy
e) A fully decarbonized transport system and better mobility
f) Energy efficiency in buildings with 0 or negative emissions
g) Establishing the enabling framework conditions for post carbon cities to flourish

Time	Milestones	Actions to achieve milestones	Time action
Local transversal coordinated public management			
2017	Reform of management	Better impact analysis rules by the local authorities of projects, better coordination between services	**2016-17**
2018	Create transversal platforms	Coordinate the all city activities	**2020 onwards**
2018	Concentrate coordination powers in the AMB authority	Law reforming the responsibilities of the Barcelona Metropolitan area authorities (AMB)	**2018**
2020	Create a larger metropolis vision	Create a metropolis vision with citizens to establish joint management structures	**2017-2020**
2035	Fully integrated territorial/urban/metro-politan management	Laws reforming the responsibilities all area authorities beyond 2020 milestone	**2018 and subsequent rulings**

High level of knowledge, awareness and information			
2018	Launch demographic needs studies	Understand the demographic needs better to plan better long term	**Now onwards**
2017	Better information loop and feedback	Create a flow of information to citizens and integrated feedback mechanism (use ICT). Real time, more personal	**2017 onwards**
2017	Clear information on the local climate change impacts	More public awareness of the situation	**2017 onwards**
2025	Young generations with better civic education	Education reform	**2017**
Implementing a green and sustainable citizen driven growth model			
2018	Monetised "good deeds"	Introduce financial recognition system for work beneficial to the city and its citizens	**2018 onwards**
2020	A better life-family balance	A plan for sustainable mobility and teleworking that all businesses have to develop.	**2020**
2023	Sharing economy	Legislate on sharing and ownership	**2025 onwards**
2020	Plan to resanitise and reuse commercial and residential areas	Reuse of abandoned spaces, incentivize the change of use in the future of residential and commercial areas towards a more sharing and mixed society. Develop the necessary actions and regulatory changes with citizen involvement.	**process**
2023	Citizen involvement stronger and incentivized (e.g. through financial mechanisms)	Introduce new systems for citizen participation, ensure that citizens understand repercussions and costs of changes and demands	**2020**
2050	A city with shared spaces, social, work, activities, cultural areas, commerce, etc.	Design of integrated neighbourhoods: Different city management, planning, architectural structures, etc… with citizen involvement	**2020 onwards**

2040	Urban vertical covered greenhouses	Developing on vertical farming in cities, new technologies	**From now onwards**
2050	Deeply Renaturalised city	Natural space needs to be part of the fabric of the city.	**Constant change**
2050	Having a large SME presence in the city – proximity shops and services preserved	Increase training for businesses - entrepreneurship Maintain and expand local services Legal and fiscal reforms to facilitate the creation of SMEs	**Constant effort** **2020**
2050	Health system guaranteed for all	Reform health system	**No specific date**
Developing green energy system and a clean low carbon circular economy			
2025	Smart Grid	Legal reforms to allow RES integration and independent entities Smart grid with 80% renewables	**2018** **2040**
2025	All products designed to be recycled or for sustainable destruction	New EU rules on product design and recycling/degradation	**2020**
2025	All waste treated and recycled	New rules on waste and proper plans	**2020**
2050	Full circular economy	Designing full circular economy systems, introduce right incentives and mechanisms (ensuring that falling emissions in the city are not due to shifting emissions to outside the city)	**From now onwards, constant changes**
A fully decarbonized transport system and better mobility			
2017	Public transport is not only designed radially but in the form of a net	Reform of transport planning Coherence between national, regional and urban area transport authorities; infrastructure planning needs to be integrated	**2015-2016**
2020	Reduce emissions from shipping in the port – ships no longer with motors on.	Change rules and build the energy connections	**2016-2020**

2030	Achieving "optimal" public transport	Fully electric with a transition period supported by fiscal incentives	**Starting now**
2035	No more fossil fuel transport in city	Law to ban fossil fuel transport and phasing in scheme	**2025**
2035	All private transport driverless	Phasing in driverless transport over 10 years	**2025**
2050	A city with mobility at its core rather than transport	Mobility is not only a question of transport, but a question of easy access to the city services. Better, more livable districts with accessible shops and services enhance mobility without the need of transport systems. The is a need to design another structure for the city.	**2020**
Energy efficiency in buildings with 0 or negative emissions			
2030	**All public** buildings renovated and energy efficient		**Now onwards**
2030	**75% of all** buildings renovated and energy efficient	*Fiscal and legal reforms* to incentivise to building renovation, intermediate milestone.	**2022**
2045	**All** buildings renovated and energy efficient	*Fiscal and legal reforms* to incentivise to building renovation	**2022**
Establishing the enabling framework for post carbon cities to flourish			
2022	EU Fiscal decentralization-division of powers directive	Allocate the right competences to the right level of governance to ensure solutions are optimal and effective.	**2018**
2030	Reaching the 3% investment in R&D for region	Incentivize R&D investment with public funds and facilitating private investment	**From now onwards**
2050	A high "happiness" index result	Ultimately the city is for the citizens. Those have to find in the city a way to fulfil their live in terms of interactions and experience, and should be motivated to be part of the city and give to it.	**Constant aim**

ASSESSMENT OF NEEDS

Crucial for achieving many of the milestones is a reform of the competences and the municipalities. The municipal borders are based on the historical city limits and the surrounding villages, today the urban area cannot be run under the present multi-municipal fragmentation of powers. There is a need to have an entity covering the metropolitan area with the appropriate coordination powers. The institution exists, but it lacks the necessary responsibilities and structures, the Area Metropolitana de Barcelona (AMB).

The cooperation with the regional authorities needs to be revisited, as many of the emissions and pollution of the city are indirect. Lower environmental impact in the city does not mean lower global impact as projections have shown in the POCACITO impact analysis. A new rational division of powers based on functional subsidiarity is required. This is a problem in all EU member states and may need a decentralisation directive.

A strong concern is the loss of character of the city and the growing disengagement of citizens. The common feeling of the participants is that the city needs to find a better balance in catering to citizens and its economic goals by promoting tourism and industry. It seems that the pressure to increase foreign revenue may be causing negative effects – even on the tourism sector itself.

The strategy is presented in the milestones and the actions. The main concern is that some key needs require political action at levels above the city competencies.

Assessment of needs

Challenges cannot be achieved by actions of the city authorities alone. Many enabling conditions have to be created by national and EU rules and regulations, as well as access to financial tools adapted to their needs.

What can the city do:

- Better planning involving stakeholders. This requires realistic scenario building by making stakeholders go through the steps. The POCACITO backcasting approach is such a tool, helping stakeholders consider the stages and understand the needs. A challenge is how to involve as many stakeholders as possible in such a complex approach.
- Integrate better the administration and create functional regional areas for management of services.
- Improve the information to citizens
- Improve social integration with a rational use of common spaces

What should the national authorities do:

- Reform the division of powers, taking into account the need to have an effective functional power distribution, in line with the climate, energy, environmental and social needs.
- Revisit fiscal decentralisation rules, so that also here the subsidiarity principle prevails helping local authorities to handle local financial needs.
- Clear coordination of national - regional transport systems
- Improve the education system
- Promote R&D and a more advanced knowledge economy

What should the EU do:

- Strict new regulations on car standards leading to 0 emissions and driverless cars
- EU directive on division of powers to promote a better more functional division based on actual needs on the ground
- Building regulation improvements to help increase the adoption of energy efficiency solutions
- Ensure that national energy rules stay in line with the renewable energy targets and help decarbonisation.
- Offer support to the regions through better exchanges of knowledge and support tools.

ISTANBUL - MILESTONES, ACTIONS AND NEEDS ASSESSMENT

The post-carbon vision of Istanbul for is; the city that able to compete in global level, dynamic, innovative, self-sufficient, sustainable, having high level of life quality and well governance.
The critical sectors are; Quality of Life, Governance, Environment and Natural Resources, Energy, Global Competitiveness.

MILESTONE	STARTEGY TOWARDS MILESONE
ENERGY: Developing energy master plan, increasing renewable energy resources and integrating them to the daily life **(2020)**	Sharing system for information and experiences Open-source data base Determining realistic targets about energy efficiency and renewable energy Determining the potential of renewable energy for Istanbul and updating regularly Adaptation of development plan to energy master plan Determining critical sectors and their related institutions on energy Revealing the current situation with respect to different sectors and identifying gaps Sustaining coordination of institutions that are assigned to prepare energy master plan Legislative arrengement for energy Providing sustainability of energy policies and implementation decisions
ENERGY: Determining of action plans and targets for energy master plan, developing framework for legal governmental regulations **(2025)**	Increasing local government's authority Increasing R&D that has implementation area Determining standards, definitions and terms about energy and efficiency Determining legal aspects of institutions that are related to defined incentive areas Management of incentives in terms of sectors Arrangmenet of legislation in order to enable energy strategies implementation
GOVERNANCE: Generating sustainable urban inventory and city information system and	Preventing confusion of authorisation between insitutions

MILESTONE	STARTEGY TOWARDS MILESONE
sharing to public (social, economic, environmental data) **(2020)**	Sustaining collaboraton between institutions Surveillance of organisation Generating a common data base Generating a monitoring system for city activities
QUALITY OF LIFE: Generating urban standards considering the identity of the city **(2020)**	Generating identity of the city that is compatible to nature nd sustainable Increasing the sense of urbanity
QUALITY OF LIFE: Planning for accessibile city **(2020)**	Developing transportation plan that focuses on human Determining areas that have traffic and accessibility problems, generating specific solutions and legislations for those areas Solving parking problem Giving priority to transportation projects (public transportation, railway systems) Integration of public transportation modes Considering disadvantageous groups while planning Increasing public spaces
QUALITY OF LIFE: Monitoring system for quality of life **(2020)**	Monitoring life quality for Istabul Increasing social facilities that service to all citizens
QUALITY OF LIFE: Increasing urban economy and welfare **(2040)**	Increasing high value added production Generating standards for infrastructure and construction
ENVIRONMENT AND NATURAL RESOURCES: Consensus of stakeholders on valuable natural resources **(2025)**	Determining the existing natural resources Including EU environmental programs to all scale development plan as a national policy Encourage of innovative and sustainable technics for construction sector Developing effective control and protection mechanisms Redeveloping legislation and standards Effective waste management Recovery of lost natural resources in developed urban areas

MILESTONE	STARTEGY TOWARDS MILESONE
	Making those who give harm to nature compensate natural damages Increasinf the natural awareness Encouraging projects and activities that are sensetive to nature Preventing confusion of authorisation between insitutions about natural areas Creating a monitoring system for natural resources Developing long term plans Making regional development plans comply with environmental plans Generating specific and local stadards for Istanbul
GLOBAL COMPETITIVENESS: Preparing economic vision plan **(2020)**	Making staging for long term and comprehensive development plan based on time and space Protecting standards of urban values and developing them (history, culture, quality of service sector, environment, tourism) Using tools that would create brand value within a common decision mechanism Sustaining security environment that would attract investors Educating qualified labour for encouraging sectors Increasing competitiveness of Istanbul between livable global cities Create science and art identity for Istanbul Determining competitive sectors for Istanbul's future Defining pioneer sectors and institutions that shapes Istanbul's economic structure Defining economic vision of Istanbul and its components Developing economic vision plan in cooperation with related institutions

ASSESSMENT OF NEEDS

LOCAL GOVERNMENT
Including women to local government decision process and projects
Considering different social groups while distribution of resources
Developing local project using pilot projects
Developing common data base (open source and avaliable), master plans and sustaining coordination
Creating common language on terms
Coordinating implementation stages in cooperation with investors
Transparency
Creating a platform briding local and national government
Increasing local government - universities collaboration, using EU funds for applicable projects
Management of finance and resources, activating implementations
NATIONAL GOVERNMENT
Incentive policies for green technologies
Determining the frame for institutions' roles and their collaboration
Generating local administrative standards that is flexible for uniqness of local values
Establishing an effective institutions working on technological adaptation
Preparing legislative and administrative frame for energy efficient projects
Control mechanism for local governments
Transparency for investments and projects in urban scale
Colaboration with local stakeholders
Giving priority to national interest for EU colaborations
Implementing pilot projects first for the new projects with consulting of academics
Considering local authorities experiences and knowledge while preparing leislations and standards
Developing economic models and financial resources
Coordination of institutions
EU
Encouraging developing countries to work on energy efficient issues
Having contry specific approach for different countries, their problems and their standards

LISBON – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

The milestones and actions defined to achieve the vision are summarised in the following table. The majority of these measures will be implemented in a pilot district (living lab), and then will be scaled up to the entire city.

OBJECTIVES	ACTIONS & MILESTONES
Promote smart and sustainable mobility (2020-2050)	Creation of more pedestrian areas and shared public spaces Awareness campaigns towards the benefits of walking and cycling (soft modes) Increase of the bicycle lanes extension Launching of public incentives to the acquisition of electric vehicles and electric bicycles Modernization of the electric vehicles charging points according to European standards and installation of new ones (36 new charging points + 1 fast charging station – Sharing Cities project) Launching a bike-sharing system with electric and non-electric modes (at least 30 e-bikes + 2 e-bike stations – Sharing Cities project) Integration of electric cars in the car-sharing system Acquisition of electric vehicles to the municipal and services' operators fleets (114 new e-vehicles – Sharing Cities project) Launching of electric cargo-bikes (micro-logistics) Launching of on-demand mobility systems Installation of smart parking sensors (30 sensors – Sharing Cities project) Launching of free Wi-Fi in public transports Creation of an Operations Centre on Mobility Imposition of tolls for entering in the city centre (historic centre without cars) Promote the use of autonomous cars (6 million autonomous cars in Europe in 2030) Promote the use of virtual technologies to avoid travel

OBJECTIVES	ACTIONS & MILESTONES
Promote sustainable urban regeneration (2020-2050)	Launching of a huge urban renewal program centred on promoting energy efficiency in buildings (starting from public buildings and integrating social housing and private buildings) Implementation and maintenance of an online interoperable Sustainable Energy Management System (SEMS), a Building Energy Management System (BEMS) and a Home Energy Management System (HEMS) Transformation of the historic centre into a smart and sustainable neighbourhood (living lab) Creation of green roofs/facades in buildings Launching of a program for co-creation of urban furniture with strong citizens' involvement (with the help of 3D printing) Supporting participatory urbanism actions (ex.: parklets, public art) Transformation of the most relevant neighbourhoods into smart and sustainable spaces Promote 100% of NZEB – Nearly net zero energy buildings (new constructions)
Promote sustainable energy (2020-2050)	Raising the share of energy consumption produced from renewable sources (100%) Installation of thermal and solar PV systems in buildings all over the city Creation of 100% intelligent public lighting systems (LED, remote control) (100 light automation sensors – Sharing Cities project) Expansion of urban gardens Installation of 10 environmental sensors (noise and air quality) – Sharing Cities project Adoption of smart grids in the city through the intervention of EDP and City Council Launching of Neighbourhood Sustainability Contests (City lab Lisbon project) Presentation of the application bid to European Green Capital Award
Improve resilience (2020-2050)	Implementation of the Climate Change Adaptation Plan Implementation of the drainage master plan Elaboration of "Resilient Lisbon" strategy and action plan Integration of Lisbon in relevant international networks on climate change (C40) Launching preventive and alert systems oriented to anticipate natural disasters (technology-based emergency management systems) Installation of video surveillance all over the city Use of drones to ensure public safety

OBJECTIVES	ACTIONS & MILESTONES
Promote social and cultural inclusion (2020-2050)	Launching a support program for civic entrepreneurship Creation of interactive panels with cultural (and other relevant) information for citizens Expansion of telemedicine Launching of co-housing initiatives Creation of a Social Innovation Hub (City Lab Lisbon project)
Promote attractiveness and economic growth (2020-2050)	Expansion of the Lisbon Network of Incubators and Co-working Spaces Creation of a fab lab in each neighbourhood Emergence of more creative hubs in the city Attraction of two important international Research Centres to Lisbon Presentation of the application bid to European Innovation Capital Award
Supporting Objectives: Governance and ICT (2020-2050)	Installation of 250 wifi sensors (Sharing Cities project) Improvement of the open data portal Creation of an urban sharing platform (Sharing Cities project) Co-creation and co-design of digital services and interfaces by and for citizens and companies Launching of calls for ideas, app contests, acceleration events and mentoring Creation of Lisbon Sustainability Forum (think-tank) (City lab Lisbon project)

It is important to stress the approval of the lighthouse project **"Sharing Cities"** under **Horizon 2020 – "Smart Cities and Communities"** (2016-2020). Lisbon is one of the lighthouse cities in partnership with London and Milan. The follower cities are Bordeaux, Burgas, and Warsaw. The global budget is around 28 M €.

Project's vision is of a "more agile and more collaborative smart cities market that dramatically increases the speed and scale at which we implement smart solutions across European cities, engaging society in new ways to cause them to play an active role in the transformation of their communities – delivering more vibrant, liveable, economically active, and resource efficient cities".

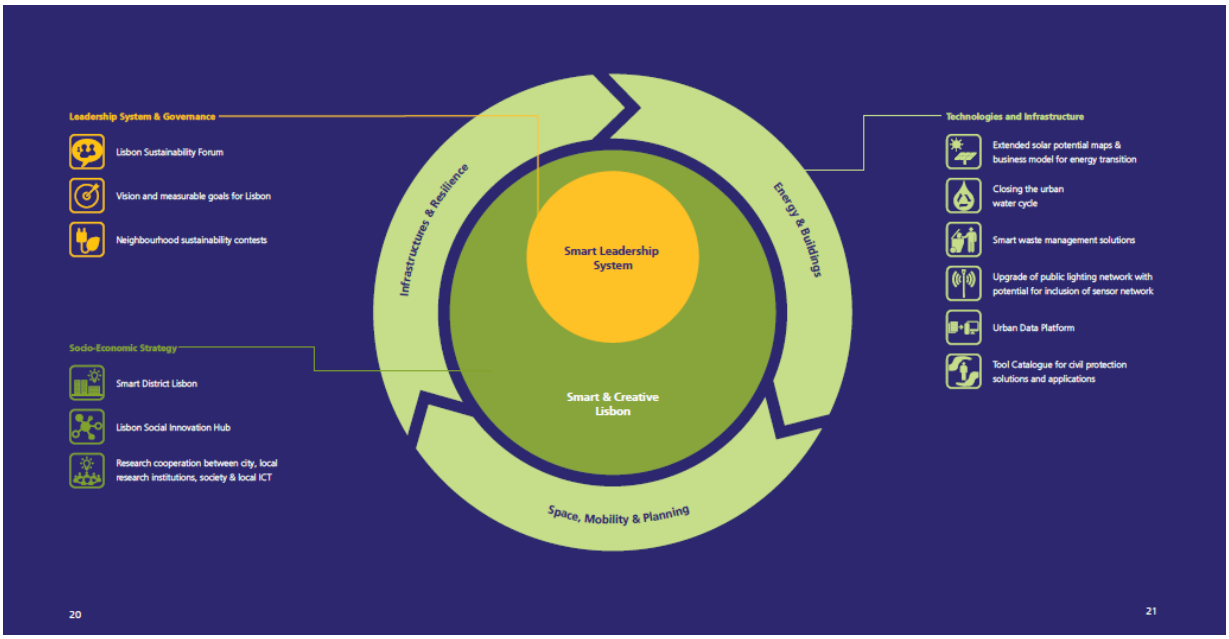
Specific objectives are:

- Aggregate demand and achieve wide scale deployment of smart city solutions;
- Deliver highly relevant common and replicable innovative solutions;
- Attract quantum external investment;
- Make acceleration in uptake of smart city solutions real;
- Deliver 3 role-model low energy efficient districts;
- Shift the thinking irreversibly to decarbonised/ local renewables;

- Shift the thinking irreversibly to new models of eMobility in the districts;
- Make real the notion of citizen participation;
- Exploit 'city data' to genuinely prove its value;
- Strengthen local scale-up businesses in (at least) the 3 cities.

Other relevant project is **"City Lab Lisbon"** developed within the initiative "Morgenstad – City of the Future" led by Fraunhofer Institute. The purpose of the City Lab was to identify the strengths and weaknesses of the city across several sectors, as well as key areas of intervention for smart and sustainable development.

The results of the City Lab research have led to an integrated set of innovative projects constituting a comprehensive roadmap going into the future. The projects are tailored to Lisbon's unique needs and are meant to support Lisbon in addressing specific challenges. When the proposed projects are combined with the already on-going activities, Lisbon can further strengthen its position as a southern European lighthouse city.



ASSESSMENT OF NEEDS

Challenges cannot be achieved by actions of the city authorities alone. Many enabling conditions have to be created by national and EU rules and regulations, as well as access to financial tools adapted to their needs. There is also a need to improve stakeholders' participation.

How can we improve the bottom-up approach to stakeholder consultation?

Consultation tools

- Adoption of open digital platforms to enhance the participation of stakeholders in the definition of local roadmaps (crowdsourcing, crowdfunding);

- Creation of Local Support Groups (as proposed by URBACT and INTERREG) and/or Smart City Commissions (ex.: Birmingham) - https://birminghamsmartcity.wordpress.com/;

- Participation of stakeholders in the collection of data and information on environmental issues (through smartphones, self-made sensors, etc.) – for ex. Smart Citizens Lab (Amsterdam) - https://waag.org/en/project/amsterdam-smart-citizens-lab;

- Launching of neighborhood contests to reduce energy consumption or to improve sustainable mobility (reduce the use of private car);

- Creation of Living Labs as open innovation and co-creation spaces, with a strong users involvement in testing sustainable urban solutions.

Stakeholders' groups

- Empowerment of citizens and communities to participate in the decision- and policy-making processes (importance of the neighborhood level);

- Consideration of a quadruple-helix innovation model (municipalities, companies, universities and knowledge centers, and civil society).

- Consideration of creative and cultural actors, and not only scientific and technological actors in the stakeholders' groups.

What should national authorities and the EU do:

Governance

- Reinforcement of local authorities' competencies.

Financing

- Revision of public procurement rules, facilitating the acquisition of sustainable and intelligent solutions by municipalities (pre-commercial public procurement of innovation; green public procurement; etc.);

- Dissemination of funding programs (articulation between national and European funds – ex.: Portugal2020, Horizon2020, Cohesion Fund, JESSICA, etc.) – red tape reduction.

Regulation

- Incentives for the acquisition of electric and green vehicles (ex.: German program – Public incentives for the acquisition of electric vehicles with a discount of 5.000 €);

- Regulation and harmonization of renewable energy cooperatives framework (legal context, support mechanisms) – ex.: http://www.coopernico.org/ (Portugal);

- Consideration of crowdfunding legal frameworks (national frameworks?; European level policy action?).

Standardization

- Definition of common standards in the area of smart and sustainable cities (considering the work that is being developed by ITU, ISO, City Protocol, etc.).

Metrics

- Definition of a common set of indicators in the area of sustainability with a geographic level equivalent to "Municipality" (considering the work that is being developed by WCCD and other organizations);

- Definition and harmonization of national (and European) monitoring systems to evaluate the level of accomplishment of national and European targets in the area of environment;

- Launching of open data platforms.

Knowledge sharing

- Sharing of good practices and experiences between municipalities.

LITOMERICE – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

The fulfilment of the set goals and visions can be hindered by many factors, internal – the mechanisms and capacities within the city itself as well as external – actions, strategies or policies of the national government or EU. Many of the factors can however be addressed and their negative impact averted. The table below lists some of the challenges faced by the city that may hinder the path towards their post-carbon vision and some suggestions on actions at the state or EU level that may prevent the negative impact or improve the own cities capacities on its way to post-carbon future.

	Challenges	**Action needed (EU or state level)**
Regulatory framework		
1. Governance	• Low environmental awareness of the government	• Trainings, instructions, education
2. Energy efficiency	• Lack of expertise • Nobody has knowledge about synergy effects and conceptual documents, conceptual approaches in general	• Conceptual support for local/ regional policy • Support in gaining expertise
	• Low energy efficiency of thermal power plants	• Law on increasing the efficiency of thermal power plants
3. Transport	• On local level, only the consequences are addressed, the issues are not addressed as complex issues, thus one problem is replaced by another • Lack of conceptual documents • Measures and programmes are not interconnected with other sectors (i.e. energy sector) • Lack of expertise	• Support of conceptual thinking and approaches • Financial resources on purchase of electric cars (for example) are fine, but the cities don´t know, how many they need. They must know, what they want or should do!
	• Increase of traffic and vehicles, parking issues, transit through city centres (especially heavy vehicles) • Especially in Czech – behaviour of car drivers toward people on bicycles and people walking is rather bad and inconsiderate	
	• Car fleet is old with high emissions • Low or none support of electro mobility	• Laws restricting the use of old vehicles • Financial support on new low emission cars and mobility

	Challenges	Action needed (EU or state level)
4. Resource and waste management		• Support of novel recycling schemes
	• Increase in generation of products that are not possible to recycle at the end of their life cycle!	• EU directive on products that must be recyclable at the end of their life cycle
5. Land management	• Unused brownfields	
	• Appropriation of high quality land	• Restrict significantly the land appropriation and favor the use of barren land and unused land
6. Energy sector	• Low awareness about the possibilities and potential of renewable energy sources - the cities do not have information about their own potential • Conceptual documents are missing	• Ambitious energy policy on the national level • Pressure of the common European energy policy • Support of alternative energy sources
	• Low share of renewable energy sources	• Support of renewables, especially geothermal energy sources
7. Air quality	• Mix of emissions, particulate matters, sludge burning	• Cooperation of universities, state health institutes etc. in the local air quality and health domains
	• Local fireplaces (on coal)	• Significant financial support on greening the local heating and local CNG networks and infrastructure
8. Social development	• Increasing share of seniors • Housing for young people and young families • Lack of financial means	• Activation of seniors • Housing support
Education	• Low level of environmental education and awareness	• Implement environmental education in education curricula and programmes (on all levels)
Health	• Lack of cooperation of involved subjects during the implementation of health plans • Lack of professional staff (doctors and nurses) in local health facilities (city hospital…)	• Health plans and their implementation
Appropriate financial instruments – economic resilience		
9. Public funding and procurement	• Public procurement is evaluated mainly by lowest price → which often means low quality	• Methods, manuals, model documentations how to design the tenders with incorporation of qualitative criteria

	Challenges	Action needed (EU or state level)
	• Lack of experience with qualitative criteria (in procurements) • Lack of knowledge and experience with designing tenders that would count also with other parameters, for example sustainability criteria etc. (for example local companies can bring other co-benefits in other domains interesting for the city like employment etc.) • Transparency, information provision to public	
	• Bad current law on public tenders	• New law enabling inclusion of other criteria (i.e. local companies, even though for higher price)
10.Building economic resilience	• Low share of local production	• Support of local production and services

MALMÖ – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

Below is a list of milestones, in some cases connected to existing or suggested strategies/plans, to achieve post carbon in Malmö by 2050. The table is a combination of results from the backcasting workshop and suggestions based on the gap analysis. It was further developed by stakeholders during the roadmap workshop. It is divided into four main areas.

SECTOR/MILESTONE (MS)	TARGET DATE	STRATEGY TOWARDS MILESONE
ENERGY, CARBON AND TRANSPORT		
MS I: Fossil free district heating system	**2025**	**Updated energy strategy/action plan for Malmö** Shift to biofuels?
MS II: Malmo City Municipality operations carbon neutral	**2025**	**Updated energy strategy/ action plan for Malmö (ongoing)**
MS III: Transport 40% electric	**2030**	Offshore wind park inaugurated 2030. Carbon Rationing per person introduced 2040. Updated traffic program for Malmö (current program expires 2017)
MS IV: Fossil fuelled transport reduced to 50%	**2035**	Large biogas plant inaugurated 2020
MS V: Average building energy reduced to 50 kWh/m^2	**2035**	Energy consumpiton tax is introduced per m^2 of living space and person. Reduce the amount of bought energy.
MS VI: Fossil fuelled transport reduced to 10% within outer city and 0% in city centre.	**2050**	Trams and subway + Malmö ring inaugurated 2020 – 2025, or probably later; 2030?. Residents use car pools/ mobility pools more.
SOCIAL		
Rejuvenation and revitalisation plan for segregated/socially challenged areas	**2025**	Already existing plans/programs: Strategic Development Plan for Anti-Discrimination Work in the City of Malmö Security program Cultural strategy Malmö Commission report on health, welfare and justice[9]
Child poverty level halved by 2020	**2020**	Target from the Malmö Commission report.

SECTOR/MILESTONE (MS)	TARGET DATE	STRATEGY TOWARDS MILESONE
Tertiary level education of culturally diverse/segregated areas within 3% of average	**2035**	To reduce segregation in housing, two large demonstration projects are suggested in the Malmö Commission report.
Health and life expectancy in Segregated areas within 5% of rest of Malmo	**2035**	
Tackle homelessness	**2016**	300 apartments dedicated to homeless people (target from the Malmö Commission report, now probably outdated due to the immigration situation)
Poverty level reduced to 2% for all residents	**2050**	
Tertiary level education of culturally diverse/segregated areas within 3% of average	**2050**	
Health and life expectancy in segregated areas within 2% of rest of Malmo	**2050**	Addressed in the Malmö commission report [9]
Population size 500 000 and constant	**2050**	400 000 inhabitants by 2035. This target was questioned in the roadmap workshop, in the light of recent high immigration numbers. It was also stated that the quality of life is more important than the number of inhabitants.
LAND USE		
No new land is built on	**2035**	Regulated today by Malmö comprehensive plan (targets to 2030) and Malmö green plan (updated plan under development) Important to focus on densification in businesses as much as in housing!
35% increase in recreational value per ha at municipal level * (240.000sek/ha)	**2050**	This target was questioned by the roadmap workshop since they did not understand the basis for valuation. The issue as such could be handled by the plan for green and blue environment in Malmö.
CIRCULAR ECONOMY		
Circular Economy strategy	**2020**	Carbon footprint calculation including consumption
Collection points and logistic systems for reuse and remanufacturing in place	**2030**	Resource management plan (part of CE strategy)

SECTOR/MILESTONE (MS)	TARGET DATE	STRATEGY TOWARDS MILESONE
Local produce accounts for 20% of food sold	**2050**	Government subsidy of fossil-free and sustainable agriculture is introduced 2025
Local reuse, refurbishment and remanufacturing companies recover 75% of collected materials/products for which there is a market.	**2050**	Resource management plan (part of CE strategy) Support entrepreneurs with new business models.
Reduce the amount of waste to incineration	**2020**	The municipal waste management company (SYSAV) has a waste plan that should govern this[8].

**Transferred site values of today range from 177.000SEK per ha in Malmö municipality to 6.000 SEK per ha in Skurup municipality.*

ASSESSMENT OF NEEDS

The following section should also be further developed during the roadmap workshop. It outlines the assessment of stakeholders on next steps. What can the city administration do, what should the national authorities do and what should the EU do to achieve post carbon in Malmö and other European cities?

CITY ADMINISTRATION:

The administration should develop and follow up strategies, targets and KPIs for the areas:

- Energy: the energy strategy document is under revision...
- Public transport: this is governed by the local traffic- and mobility plan. It is important to define how transport efficiency should be measured: as fuel per person km or in other terms?
- Goods transport is also important to measure with the aim to develop more efficient logistic solutions. The goods transport plan is an important document for this.
- Local food production
- Social sustainability: the report from the "Malmö commission on social sustainability"[9] governs many of the social issues relating to the gaps in health due to differences in education, housing standards, income and employment etc. It suggests a number of actions related to these areas that need to be followed up continuously.
- Green and blue space: there is ongoing work on a plan for the green and blue environment in Malmö. This is an important document with regard to recreational values and urban sprawl.

[8] SYSAV (2015). Kretsloppsplan 2016 - 2020 http://www.sysav.se/Om-oss/Om-foretaget/Regionens-avfallsplanering/kretsloppsplan-2016-2020/

[9] The Malmö Commission, 2013. "Malmös väg mot en hållbar framtid – hälsa, välfärd och rättvisa" http://www.slideshare.net/fullscreen/rodaberget/malmkommissionen-slutrapport-digital130225/5

- Circular economy – this should include supporting local innovative businesses that seek to reuse, refurbish, repair and remanufacture products. This could involve capturing some emerging technologies and techniques such as 3D printing, product "hacking" (combining components from products to form innovative new products) and using the internet for increased knowledge of product design and engineering. It should include working closely with the national government to ensure policies on trade, industry, innovation and the environment align with the goals of a circular city.

The city administration should also continue to showcase good examples, e.g. demonstration projects of different kinds.

NATIONAL AUTHORITIES AND GOVERNMENT:

The national authorities need to provide clear, consistent and long term economic incentives to promote post carbon activities. Some examples of incentives are:

- Tax shifts
- Higher energy prices
- Carbon rationing
- Investment support for new business-models
- Refund systems for new fractions

There is also a need for clear national goals/targets for environmental and social development.

Furthermore, the national government has a key role in setting clear and ambitious policies that support and foster the circular economy in cities. This requires ensuring that the many sectors and areas that are related to the circular economy, including trade, industry, innovation and environment. It also requires that the government works with industry and sets policies to support business models that facilitate the circular economy. But also, that it encourages product design and knowledge transfer that provides SME's with the ability and knowledge to perform circular functions such as repair and remanufacturing.

EU:

The EU governs much of national legislation in the member states today. There is a need to operationalize legislation that leads to a more circular and less carbon intensive economy. Examples of such legislation include:

- The waste directive and end of waste criteria (and their national implementation)
- Standards for recycled materials
- Incentives for resource efficiency (such as reuse and use of secondary raw materials)
- Incentives for energy efficiency that makes it possible to overcome the barrier of high investment costs
- Higher ETS (European Trading System) prices for carbon
- Policy connected to new, innovative business models

The Malmö stakeholders emphasized the need for a clear long term vision to work towards, and clarity on policies and incentives that provide the framework for their authority. The Malmö stakeholders

emphasized that some nations should be allowed to be “forerunners” and set goals that exeed EU levels. Individual countries should be able to develop and advance from their own level.

INDUSTRY/BUSINESS:

The industry should act as fore-runners and make investments in renewables and circular business models wherever possible. These early adapters act as inspiration and show cases for the rest of society on how to progress towards a sustainable society.

MILAN – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

Milestones and actions proposed during the second stakeholder workshops[10], as related to transport, energy, social issues, and consumption include:

TRANSPORT MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
Integration, connection, multimodality		
Creation of an integrated public transport system	2030	Create a new policy framework with incentives, parking and congestion implications, and modal shift.
		Make sustainable accessibility to new areas of urban transformation.
		Make the parking system more efficient.
		Organize and develop the logistics of the last mile for the distribution of goods in the city.
		Overcome barriers and make the city more accessible for everyone.
		Promote the development of a new urban freight logistics.
		Rationalize the use of motor vehicles, i.e. Area C sharing systems and smart solutions.
		Urban Car Park Program
		Urban Traffic Plan
		Enact road pricing to support more efficient distribution of goods within the city.
		Develop informatics infrastructure including smart stops and smart times for public transportation on busses, trains, and trams.
Changes in transport Infrastructures		
A more widespread network of public transport, including extension of the circular lines to connect outlying areas.	2050	Create park and ride parking lots.
		Enhance rail service.
		Raise levels of security, spreading pedestrian areas and environmental islands
		Set a vision for the subway system.
		Create pedestrian areas in the periphery of the city, especially to link the centre to surrounding suburbs
		Develop infrastructure for public transport.

[10] See Report on Stakeholder Workshops, POCACITO Deliverable 4.2, available at http://pocacito.eu/content/report-stakeholder-workshops

TRANSPORT MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
		Limit car use through extension of pedestrian areas, speed limit zones, parking payment.
		Facilitate and support cycling. Create bike, also electric bike, sharing projects to provide alternative options to taking one's own car.
		Extend road pricing to encourage use of public transport and discourage private car use.
		Make preferential lanes for people who are carpooling.
Quality of public transport		
Public transport becomes faster and less expensive than private transport	2020	Promote already initiated actions, such as traffic limitations and better public transport, in order to create consensus and momentum for new further reaching policies, as public policies are highly visible.
		Triennial Program of Local Public Transport Services
		Strengthen and make public transport services more efficient, and encourage sustainable mobility (e.g. bicycle, electric, car sharing) (PAES).
CO2 free transport		
All (or a certain percentage of) cars are electric	2030	Marketing and communication, and education and awareness raising on the benefits of electric vehicles.
		Create incentives for buying electric rather than gasoline-fuelled vehicles.
		Substitute municipal vehicle fleets with new ones that use clean technologies.
There are a sufficient number of electric car charging points inside and outside the city	2020	Increase number of charging points for electric cars
Electric transport used for the distribution of a certain percentage of goods throughout and within the city	2020	No specific measures have been indicated
10% transport consumption met by renewable energy	2020	-

ENERGY MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
Reform of energy generation and distribution		
17% final consumption of energy through renewable sources	2020	Promote and encourage the use of solar thermal, photovoltaics and geothermal heat pumps (PAES).
The city is using more renewable energy than carbon energy sources	2030	
The number or percentage of households or the city connected to the district heating/cooling network can be used to measure progress	2050	Build smart grids.
		Develop decentralized system of power/heating/cooling plants.
		Develop new technologically innovative applications that will support co-generation and tri-generation.
		Create a co-generation (heat and electricity produced from same energy source) network to use excess heat from industry to heat residential/commercial properties through the district heating/cooling network.
		Create micro tri-generation (heating, cooling, and energy production) plants as pilot projects for big public and private energy users (hospitals, schools, etc.).
Overall Concepts and plans, improvements of energy performance		
Goals for emission reduction reached in time (PAES target: 20% by 2020, compared to the baseline year 2005)	2020	Identify necessary regulations, incentives, and training in order to trigger actions for energy improvement and the reduction of electricity consumption and emissions in the business sector (PAES).
		Give incentives for carbon free energy production and consumption.
		Set electric energy standards.
20% final consumption met with renewable sources (use electrical, thermal and transport)	2020	Communicate the economic benefits derived from equipment conversion toward district heating, heat pumps, and solar and thermal energy.
20% reduction in consumption of primary sources compared to the forecast trend, by increasing efficiency	2020	Measures of energy recovery from the integrated water cycle using heat pumps to heat buildings near (or in) industrial wastewater treatment plants.
		Power public lighting with lost energy consumption.
13% reduction in GHG emissions in non-ETS sectors compared to 2005	2020	No specific measures proposed

ENERGY MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
Energy efficient/energy producing buildings		
Overall national energy savings of 9.6% by 2016 in accordance with the National Action Plan for Energy Efficiency (*Piano d'Azione Nazionale per l'Efficienza Energetica – PAEE*)	2020	Create regulations for increasing energy efficiency for buildings taking into account characteristics of existing buildings.
		Develop smart infrastructure and buildings to consume less energy.
		Identify regulatory measures, create incentives, and train citizens to reduce electricity consumption and emissions in public and private buildings (PAES).
		Create a network for district heating and cooling.
One hundred percent of new buildings are zero energy or carbon neutral	2030	-

LAND USE MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
Quality of the urban environment		
The number of parks opened, percentage of permeable surfaces, and waterways re-opened increase	2020	Re-open some of the city's waterways.
		Increase the concentration of production/industrial areas and structures, as this allows for better organization of transport logistics.
		Rehabilitate deprived areas by creating eco-districts
Acoustic classification of the Territory (*Classificazione acustica del Territorio – Zonizzazione acustica*): safeguard areas not yet hit by noise pollution, and identify areas that require recovery plans because detectable acoustic levels exceed the limits identified to risk to public health	2020	Acoustic classification of the Territory
Pedestrian areas in the periphery of the city, especially to link the centre to surrounding suburbs (make sub-centres in the periphery more attractive)	2020	Construct "Green mile"

SOCIAL MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
Citizens change their lifestyles and become more sensitive	2030	Educate citizens on their role and responsibilities as members of the city.

CONSUMPTION MILESTONES	TIMEFRAME	STARTEGY TOWARDS MILESONE
High percentage of waste reduced and high percentage of materials recycled	2020	Increase waste sorting (PAES). Make the separation of waste and recyclables more user-friendly and more efficient.
		If waste cannot be prevented, it should be reused or prepared for reuse, recycled, incinerated with energy recovery, or disposed of in landfill, if no other option is available (EU Waste Framework Directive).
Effective waste management	2020	Increase the efficient energy recovery of residual waste (PAES). Make efficient use of the existing system, i.e. use incinerators to create energy and lower the amount of materials placed in landfills, and consider opportunity costs, i.e. in some cases there are high costs to recycle materials that also produce good energy (e.g. paper).

Milestones and actions modelled in the quantification of PC2050 (as noted in Deliverable 5.2) include:

ELEMENT	ACTIONS & MILESTONES FROM PC2050
Transport	City of sharing, that makes services accessible even through alternative or complementary forms of private transport Pedestrian friendly city with shared spaces Accessible and usable without a car Carbon-free integrated transport systems Public transport faster, cheaper and more convenient than private transport. Creation of an integrated public transport system. A more widespread network of public transport, including extension of the circular lines to connect outlying areas. Bike network – bike sharing. Smart park and ride facilities. New urban freight logistics Extend road pricing to encourage use of public transport and discourage private car use. Electric cars Substitute municipal vehicle fleets with new ones that use clean technologies. Add more electric car charging points (serviced by renewably produced energy).
Housing	Low energy buildings, in the direction of the passive house District heating and cooling with renewable energy sources for all households
Building	High energy efficiency Energy needed for the city to function is produced from renewable sources Low energy buildings, in the direction of the passive house Many buildings able to produce energy feed it back into the system through the smart grid District heating and cooling with renewable energy sources for all households. Linked with CHP network with industry so that waste heat is utilised micro tri-generation (heating, cooling, and energy production) plants as pilot projects for big public and private energy users (hospitals, schools, etc.). Measures of energy recovery from the integrated water cycle using heat pumps to heat buildings near (or in) industrial wastewater treatment plants Goal of 100% of new buildings are zero energy or carbon neutral.

ASSESSMENT OF NEEDS

The stakeholders discussed the assessment of gaps in relation to the planned actions presented by the POCACITO researchers and confronted them with the current status and ongoing trends in Milan. They concluded that several aspects of Milan's post-carbon development require further consideration. In particular, they highlighted the need to:

- Increase the supply of local renewable energy and decrease the reliance on national grid supplied electricity;
- Increase energy efficiency;
- Reduce social inequality;
- Limit urban sprawl and address implications for energy use, infrastructure investment, and transport;
- Improve consumption habits and the impacts of consumption; and
- Decrease water losses.

In the fourth workshop, held jointly with representatives from Turin, stakeholders analyzed the results from the quantification of the PC2050 scenarios to assess these remaining needs. The main conclusion for Milan was that the biggest gap in terms of the use of renewable energy is attributable to the use of electricity from the national grid, considering that the major gap in relation to CO_2 emissions calculated corresponded to the emissions due to emissions form energy generation for the national grid and consumed inside Milan. Stakeholders determined that a solution would require political competencies beyond the municipal level. Addressing this issue of renewable energy requires national policies of de-carbonization, which can take advantage of the potential of innovation developed in recent years. Furthermore, stakeholders noted that ambition and concrete investments can continue to support the trend towards a higher share of renewable energy also within the city.

In relation to the necessary investments, legislation and fiscal security are needed in the medium to long term, which are currently discouraged by frequent regulatory changes. A security system for the duration of depreciation period of the capital is needed, for example regulations for installations for the use of the geothermal energy. In the case of Italy, this assurance has not always existed, as with subsidies for photovoltaic systems. A second issue brought forward by participants is related to the need of proper resources related as a basic condition for autonomous local de-carbonization policies. Beyond the legal and fiscal security of investments used for the implementation of local policies for de-carbonization, there is indeed a need for human resources able to create projects, follow their implementation, and monitor their actual effectiveness. Currently, Italian municipalities are not able to devote the necessary resources to these tasks. Some stakeholders even expressed doubt about the effective local capacities for implementing local plans for energy saving projects due to lack of personnel in charge of driving implementation or mainstreaming of these plans.

In a period where local authorities struggle in maintaining essential local services, the implementation of de-carbonization projects suffers from a lack of resources and long term perspectives. The stakeholders call the European Commission asking for European strategies for safeguarding local authorities' autonomy in order to allow for the implementation of autonomous local policies.

The implementation of a **Carbon Tax** might provide local authorities with such targeted financial resources, provided that the implementation follows principles of transparency, communication and monitoring of resources, to ensure their re-use for de-carbonization strategies.

Besides these national level measures needed to realize a complete de-carbonization by 2050, stakeholders identified some further strategic measures to be implemented at the city level. For example, an important measure that has been discussed is the complete ban of cars that use fossil fuels by 2025. This measure is actually under discussion in Norway.

Stakeholders did not identify any new measures for energy generation strategies for Milan or Turin.

With regards to the issues connected to urban sprawl at the expense of agricultural or natural area, stakeholders discussed the potential efficiency of measures already in place, like stopping new definition of expanding areas in master plans of municipalities around the city. Stakeholders agreed that the growth period of Milan was over and as a consequence needs for new buildings could be satisfied by replacing existing underused buildings and using internal derelict areas. The use of existing areas was also connected, in the discussion among stakeholders with the creation of new spaces for new enterprises closing links in the circular economy; this was seen at the same time as a potential measure for social inclusion, as recycling initiatives are already now frequently connected to the third sector and provides occupation for less qualified persons. Stabilizing these initiatives by providing them with public support and space was seen as a cross-cutting measure for promoting circular economy re-using underused areas in the city and reducing social inclusion and urban poverty. Most measures and strategies supporting a post-carbon transition under the themes of urban society, sprawl, and circular economy and lifestyles that were discussed serve potentially more than one of the gaps identified, especially those related to circular economy and lifestyles which would, at the same time, serve also for closing social gaps, promoting social and spatial inclusion:

MILESTONE	STRATEGY TOWARDS MILESTONE
Improved access to new technologies, to create knowledge and reduce the generational gap and the gap between social groups	Implement open data structures, infrastructures and networks, and open innovation
Urban regeneration projects	Economic development, reduce social inequalities, balance environment and urban design, stop soil consumption
Eliminate food waste	Agricultural policies for food security

Urban society

- Cohesion - besides increased interaction between public and private spheres, expand the space of the third sector in urban areas (with organizational interventions and the provision of physical and virtual spaces); this would enlarge spaces for circular economy, creating physical and logistic spaces for new economic activities, and new occupation;
- The accessibility to networks, services and goods – creating new networks for sharing resources and opportunities; would provide the infrastructure for a circular economy and
- Equitability – support for the weaker sections of society in the participation and access to the energy reduction tools (i.e. purchases and investment in energy efficiency and renewable energies supporting the necessary investment for low income households).

Circular economy and lifestyles

- The aim is to obtain a more continuous circular economy chain to facilitate the connection and the relationship between "supply and demand" – extend the use of existing elements (e.g. via used market, sales and recycling of used items, etc.) and create physical space (at the neighborhood level) and economic space (by eliminating obstacles in this sector and for small professionals) for the exchange of goods and non-professional services: further to the measures mentioned in relation to social inclusion and an more inclusive urban society,
    - Facilitate and support the bureaucracy of processes with the aim of facilitating exchange and new economic activities in this sector;
    - Promote access and the relationship between supply and the offering of second-hand goods by creating physical and logistic spaces for exchange for both professional and non-professional services and
    - Make the management of start-up of activities and professions less bureaucratic.

Urban sprawl

Stakeholders agreed that the city's expansion phase has come to an end and the increase in population of more than 600,000 people (as proposed in the POCACITO Post Carbon Scenario in 2050) seems not realistic given the low birth rate and the expected trend in immigration in the city. However, some considerations on strategies to be enforced for avoiding further urban sprawl were made with the aim of supporting planning policies for "zero" consumption of land for urban expansion in the territory;

- Analyze existing urban plans and currently unused existing building volumes to be exploited and
- Encourage urban regeneration in building replacement creating spaces also for new economic activities, for instance promoting activities for a circular economy.

TIMELINE	MASTER PLAN + ADDITIONAL MEASURES, BOLD = HIGH PRIORITY	ACTOR	MILESTONES, DEADLINE	OPPORTUNITIES, CHALLENGES
finished	Analysis of the potential of regenerative energy in Rostock	Municipality	2013	Low potential: Water (geographically unsuitable), wind and energy crops (no space). Medium potential: Geothermal (good usability; but undesirable inefficient competition with existing solutions may emerge); waste & grey water are already used as sources of energy. High Potential: Solarthermics for heating and photovoltaic for energy generation. Share of renewable in energy consumption: 4%.
	Consumer climate saving book	Private HH	2013	direct saving incentives through vouchers
	Online information platform for local energy supply options in Rostock	Municipality	since 2011	ongoing updates, promoting private investments for climate friendly energy options
	Waste company using LED-advertisement	Waste company	2013	energy savings
	Waste company driver training	Waste company	finished	incentives for eco-friendly driving, diesel savings
started	Energy-oriented housing refurbishment	Public transport company	to be finished by 2020	energy savings/sqm
running	Concept climate-neutral municipalities	Municipality	to be finished by 2020	energy savings, role model function
running	Implementation of the communication concept for the Master Plan	Municipality	ongoing	supporting climate protection actions, informing & motivating citizens
running	**In city climate protection planning, development & construction**	Municipality	ongoing	especially influential during the conceptual phase e.g., through guidelines; environmental reports; long-term CO2- reduction; difficulties in internal acceptance
running	**Obligation for municipal businesses to provide an energy report**	Municipality		support energy efficiency in municipal companies
running	**Conceptualization of educational projects for energy efficiency in schools/ kindergartens**	Private HH	yearly	support energy efficient behaviour
running	Information on independent individual energy advisory services for home owners / tenants	Private HH, energy alliance		spill-over effects in energy efficiency

TIMELINE	MASTER PLAN + ADDITIONAL MEASURES, BOLD = HIGH PRIORITY	ACTOR	MILESTONES, DEADLINE	OPPORTUNITIES, CHALLENGES
running	Public information and education events for energy efficiency in private households	Private HH, municipality, service companies	ongoing	spillover effects in energy efficiency
running	Executing thematic campaigns, e.g., city cycling, climate action day	Municipality Private HH	ongoing	spillover effects in energy efficiency; missing project carrier
running	Participating in a national energy saving project for low-income households	Private HH, NGOs, employment agency		spillover effects in energy efficiency
running	Including more businesses and industries into the energy alliance	Energy alliance, municipality	ongoing	strengthening energy alliance, improved data base
running	Information on funding for qualified individual energy consultation for businesses	Municipality		website, start now!, spillover effects in energy efficiency
running	Coordination of group projects for energy efficiency such as regular energy tables, ÖKOPROFIT	Municipality	ongoing, min. 100 businesses until 2020	energy alliance is exchanging on this, spillover effects in energy efficiency, average energy reduction of 1,5% p. a.
running	**Implementation of energy management systems in businesses**	Businesses, service companies	ongoing	financial incentives should turn this into a sure-fire success, SMEs probably have higher implementation barrier and should be supported
running	Influence user's behaviour; solar systems; extend storage systems; energy-oriented refurbishment; thermal pumps, optimizing heating surfaces, new concepts (plasma toilettes, grey water use)	Housing company	to be finished by 2050	reducing electric/heating energy by 36% (compared to 2010 levels)
running	Topic area heat (services, industry, commerce)	University Rostock	ongoing	reducing electric/heating energy use per sqm
running	Introducing a workplace mobility management scheme for the municipality incl. Fleet management, increasing bike and public transport use	Municipality		emission reduction, role model function

TIMELINE	MASTER PLAN + ADDITIONAL MEASURES, BOLD = HIGH PRIORITY	ACTOR	MILESTONES, DEADLINE	OPPORTUNITIES, CHALLENGES
running	**Increasing the share of long-distance heating for home's room heating, in apartment constructions 80% supply rate**	Public utility	objectives: by 2030: 70% of the housing market are covered and profitability is reached; until 2050: 53% of total heating demand covered by long-distance heating	other sources of energy can be fed into long-distance heating systems
running	Checking options on new wind energy parks (on/ offshore) close to Rostock with physical network into Rostock	Public utility and further actors	ongoing request	obstacle: connection of operators; shares are checked
running	Foundation of energy co-operations / climate funds	Private initiative, Agenda 21 group, initial support by municipality	ongoing	increase share of, acceptance and participation in renewables, one citizen coop exists, further should emerge; obstacles: commercial management missing
running	Staff training in energy and climate protection	Municipality	ongoing	new: extend training target group to politicians & city administration
running	National energy saving campaign	Municipality	to be finished by 2015	awareness raising and energy saving
running	Energy saving competition in schools	Municipality	to be finished by 2015	support energy saving action, reduce energy consumption
	Study on sewage sludge disintegration, heat usage & energy management systems	Water supply company	to be finished by 2020	reducing electric energy use by 28% and heating energy by 10% in 2050 compared to 2010 levels
2015	Master Plan data bank system + maintenance	Municipality	to be finished by 2015	long-term, efficient controlling
2015	Website + maintenance	Energy alliance, municipality, service provider	asap	efficient communication, obstacle: not possible on municipality website
2015	**Planning guide energy and construction / energy standards**	Municipality	to be finished by 2015	technical efficiency, minimum standards, role model function
2015	Municipal energy management	Municipality	ongoing, property management evaluation finished	project hangs between divisions

TIMELINE	MASTER PLAN + ADDITIONAL MEASURES, BOLD = HIGH PRIORITY	ACTOR	MILESTONES, DEADLINE	OPPORTUNITIES, CHALLENGES
2015	Energy concept for buildings	Municipality		identify energy efficiency potentials, have more concrete energy efficiency measures, using renewables
2015	Inspection of the technical facilities at the waste management company for options on energy optimization, demonstrating energy saving potentials	Waste company		reducing heating energy demand by 10%, increasing security at facility
2015	Feasibility of heating oil substitution in the compost plant	Waste company		saving 30.000l heating oil/year
2015	**Strengthening the public transport system (developing a future mobility plan)**	Municipality	mobility plan by end of 2015 and prior that: third public forum, commuter survey	the public utility and public transport company are working on a mobility strategy
2015	**Conceptualization of improved urban-rural transport linkages**	Municipality, regional municipal association		reducing individual motorized traffic
2015	Construction of solar system "Old Gasworks", 1 Mwpeak	Public utility	land use plan is with city mayor, response pending	increase in share of renewables, electricity generation by 0.9 GWh/a
	Use of efficient technology (Green IT), improved user behaviour, space reduction, energy-oriented refurbishment	Municipal construction department	finished by 2020	reduce electric energy consumption by 5% and heating consumption by 15%
2016	Sustainable procurement catalogue	Municipality		improve energy efficiency, reduce negative environmental impact, role model function
2016	Continue energy efficient street lightening	Municipality, public utility		reducing energy use
2016	Development of a energy & climate protection concept for the industrial area	Municipality		obstacles: interested parties missing
2016	Develop a mobility management concept for improved rural-urban transport linkages in regards to a mobility central and a bicycle station at central station	Mobility coordinator, planning association, municipality, service providers		reducing individual motorized traffic

POCACITO

TIMELINE	MASTER PLAN + ADDITIONAL MEASURES, BOLD = HIGH PRIORITY	ACTOR	MILESTONES, DEADLINE	OPPORTUNITIES, CHALLENGES
from 2016 onwards	Energy-oriented city refurbishment & quarter management	Municipality	integrated city concept to begin in 2016	reducing energy consumption in historical buildings, using national funds
2018	Technical refurbishment of the heating & power plant Marienehe	Public utility		securing expansion potential of the long-distance heating system
2016/17	Green-IT in municipality	Municipality		energy reduction, role model function; obstacles: staff capacities
2030-2050	**Conceptualization for a conversion of the heating and power plant "Marienehe" to renewable energy**	Public utility	starting 2025	high CO_2-reductions; obstacles: technically difficult to assess and realize, last gas turbine change in 2014 leads to another 20 years of status quo run time - this investment pays off esp. if future focus is on Power2Gas
to be added	Roof-top solar systems			obstacles: housing companies have held back, for the cooperatives it is difficult for legal and tax reasons as energy production is not major operational field

The city's measures are mainly transport and energy related. The consumption and waste management part of the vision was discussed shortly through the concept of sufficiency where individuals question their wants and needs, asking what they really need, and hence reduce their resource and energy use. However, this proved to be too abstract for the participants to deduct measures. During the final discussion, the stakeholders highlighted the following main opportunities:

The Master Plan should be considered by all decision makers in all sectors in Rostock or at least those responsible for implementing the measures, which is not yet the case,

- The energy alliance could host a showcase event where participants of the Master Plan present their implementation status, which would further strengthen the overall acceptance and understanding of the Master Plan,
- Focus could be placed on the prioritized Master Plan measures,
- Rostock has a lot of ambitious projects (see table of Master Plan measures above)

The following challenges were expressed:

- The city of Rostock will not be able to do this alone, financial support and expertise is needed.
- The implementation of measures may be disrupted by unforeseeable dynamics and technical developments,
- The concept of sufficiency is necessary, but difficult to mediate.
- Conflicts of interest exist: e.g., establishing or sustaining green space vs. building a compact city with high mobility and short distances (soil sealing)

TURIN – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

The milestones and actions proposed in the second workshop, and revised in the fourth one, are summarised in the following table:

MILESTONE	STARTEGY TOWARDS MILESONE
Reduction of soil consumption (2020)	Preserve natural and agricultural soils Re-naturalize abandoned built areas Promote instruments for moving and concentrating building rights in the empty spaces inside the existing city
Facing the ageing society (2020)	Enhance social housing Develop user-friendly technologies Improve welfare through ICT
Turin as a touristic city (2020)	Create innovative offers and holiday packages for tourists
20% reduction of emissions from buildings (2025)	Spreadly adopt certifications of energy performance Adopt incentives to building renovation
New jobs from green tech (2030)	Increase cooperation between universities and local companies Innovate financial tools for R&D and startups Promote renewable energy sources Enhance tertiary education in scientific issues
50% reduction of emissions from transport (2035)	Introduce congestion charge Foster telecommuting Halve use of private cars through promotion of more sustainable mode of transport
Turin as an inclusive and "shared" city (2040)	Define new models of education and training Innovate tools and resources for welfare

ASSESSMENT OF NEEDS

In the fourth workshop, the discussion about the results of the GAP analysis led the stakeholder to propose further actions, to integrate the set identified in the second workshop.

At the local level, the main measures proposed were:

- improve access to new technologies, reducing digital divide and generational and social gaps, through open data, digital platforms, networks, etc.;
- increase the role of the third sector for circular economy, creating physical and logistic spaces for new economic activities;
- promote new programmes of urban regeneration, whose impacts should at the same time reduce social inequalities, increase building energy efficiency and avoid further consumption of soil;
- simplify the creation of new start-ups in the sectors of the sharing economy;
- reduce food and water waste;
- guarantee the presence of the monitoring-assessing-reporting chain, in order to keep under control the effectiveness of the post-carbon strategy on the long term.

In the workshop, not all the actors seemed to be fully aware that a post-carbon strategy has to be interdisciplinary and integrated in environmental, social and economic terms. In particular, it was conceived by some stakeholders as a mainly energetic/environmental strategy, while its economic opportunities and social benefits. A greatest dissemination about the complexity and multi-faced characterization of the post-carbon approach could widen the audience of potential stakeholders interested to post-carbon measures.

As regards the national and EU level, an issue that emerged in the last Turin-Milan integrated workshop is that local actors often believe not to have the requested skill and knowledge to define and implement a complex and interdisciplinary strategy, such as the post-carbon roadmap. A support from the EU and national levels could be aimed to offer training opportunities and life-long learning to urban and metropolitan public administrators.

Another issue is clarity in national strategy. For example, in the case of Turin and Milan stakeholders put in evidence that the effective “post-carbon” evolution of the cities in energetic terms will significantly depend on the weight of renewable sources that will be used to produce electricity at the national level: it is then important that national policies and strategies are as clear as possible in defining their targets and impacts.

Again, at the national level, Italy lacks legislation and fiscal security to the investments necessary for promoting post-carbon trends in the medium to long term, which are currently discouraged by frequent regulatory changes. A security system for the duration of depreciation period of the capital is needed, as the subsidies for photovoltaic systems.

Also, benchmarking to other European (but also non-European) cities is considered useful to stay on track about best practices and measures to be adopted.

Finally, some consideration about the opportunity of interurban coordinated post-carbon policies, as emerged (or not) in the integrated POCACITO case study of Turin and Milan. During the workshops, although explicitly asked and stimulated to keep in mind the relation between the two cities, participants tended to focus on their own city as a separate territorial object. In particular, participants

did not consider a major integration of the two cities as an opportunity for the vision, neither for promoting post-carbon policies, or for improving local competitiveness.

Asked to think over the right territorial and institutional level to implement post-carbon policies and actions, stakeholders recognized that the city level is in general not sufficient (for example for policies against pollution, waste etc.) and policies have to be thought at a wider level (for example to develop the area between Turin and Milan). But this wider level does not necessarily correspond to the two cities: according to stakeholders, most of the post-carbon policies that cannot be implemented at the city level, have to be proposed at a metropolitan or even at a regional level (for example for the whole Piedmont region, or the whole Northwestern Italy), rather than through a cooperation between Milan and Turin.

According to the stakeholders, this cooperation can turn out really effective only in the context of policies for R&D and tertiary education: Milan and Turin have universities which are important at the European level, but these have to cooperate to compete in the global context. Moreover, the two cities have different economic specializations, that can be complementary for promoting technological research and development.

ZAGREB – MILESTONES, ACTIONS AND NEEDS ASSESSMENT

Time	Milestones	Actions to achieve milestones
2016-2020	Research of local resources and new technologies	Establishment of centers for research of local resources and new technologies
2016-2020	Social entrepreneurship	Encouraging development of small and medium-sized social entrepreneurship
2016-2020	Reuse and recycle centers	Establishment of the Centers for reuse
2016-2020	Low carbon strategy and action plan	Development of a strategy and action plan to reduce greenhouse gas emissions
2016-2020	Increasing share of renewable energy in energy production	Incentivizing investment in renewable energy and energy efficiency for local use
2016-2020	Urban agriculture	Providing more spaces for local food production and their permanent designation in spatial plans
2016-2020	Utilization of EU funds	Participation in large number of EU and international projects
2016-2020	Communication and coordination with citizens	Establishment of the Centre for communication and coordination with citizens and civic initiatives
2016-2020	Urban regeneration	Conversion of existing unused urban spaces into business incubators
2016-2020	Monitoring the quality of all components of environment	Setting up systems for monitoring the quality of all components of environment
2016-2020	Climate Change Adaptation Plan	Adaptation of the strategy
2020-2030	Resource efficiency	Use of social innovation to achieve resource efficiency
2020-2030	Reducing the use of motorized vehicles	Implementation of new cycling infrastructure
2020-2030	Food in public spaces	Growing edible plants in public spaces

Time	Milestones	Actions to achieve milestones
2020-2030	Sustainable consumption	Implementation of educational and information campaigns on sustainable consumption
2020-2030	Decentralized and democratized energy production of renewable energy sources	Increasing the supply of renewable energy
2020-2030	All existing buildings renovated and energy efficient	Implementation of energy efficiency measures in public buildings and private households
2020-2030	Food donation programs	Establishment of a sustainable system of donation and distribution of food from the supermarket chains
2020-2030	Better food quality	Introduction of an effective system to control the quality of food
2020-2030	Transparency in public administration	Development of a culture of transparency in public administration
2020-2030	Public spaces	Optimization and planning the use of spaces in accordance with the needs of community
2020-2030	Lifelong learning	Introduction of civic education as a basis for involvement and participation of citizens; promoting non-formal education
2020-2030	Critical thinking	Development of comprehensive schools and kindergartens
2020-2030	Participative budgeting	Co-decision and participation of citizens in the management of the city budget
2020-2030	Active citizens	Creating a connected active neighborhood that participate in the local self-governance
2020-2030	Sustainable transportation of goods	Introduction of obligation to use sustainable means of transportation for transportation of goods and delivery
2020-2030	Living streets	Revitalization of public spaces and streets to encourage social inclusion and outdoor activities
2020-2030	Efficient public transport system	Development of the public transport system with transport hubs that allows easy transition from one mean of transport to another; Introduction of obligation of basic public

Time	Milestones	Actions to achieve milestones
		services availability within a short distance radius from all places of residence
2030-2050	Introduction of low-carbon urban areas	Strengthening neighborhood identities
2030-2050	Circular economy	Development of a local plan of introducing circular economy and Introduction of concept of 'life cycle of products and services', which follows the environmental footprint of products and services
2030-2050	All production of energy in the city and surrounding areas	Development of central heating system, Introduction of obligation of setting photovoltaics or green roofs on all new buildings
2030-2050	Soil regeneration	Using the principles of restoring agriculture
2030-2050	Local food production	Short food supply chains; Developing a network of small producers to exchange locally produced food, Eco markets, stimulating the development of family farms and agricultural production around the town
2030-2050	Social inclusion	Development of wide range of measures aimed at social inclusion of marginalized citizens
2030-2050	Governance reform	Encouraging new governance and communication models to engage citizens
2030-2050	Healthy lifestyle	Broad implementation of measures for preventive medicine and increased number of health care
2030-2050	E-vehicles	Popularization of ecological vehicles and development of e-filling station

ASSESSMENT OF NEEDS

What can the city do?

- develop and ensure stable long-term vision
- develop more specialized strategies and actions plans and work on their execution
- setting more ambitious targets than the national targets and frameworks are set
- considering small scale projects can have bigger impacts on citizens life that big projects
- give more attention to citizens initiatives and grassroots ideas
- start using incentives and taxes as a mode of award for sustainable projects
- develop a continuous dialogue with citizens
- reform of the governance structure - make if more flexible, collaborative and inter-sectoral
- start accepting social innovations in urban governance and financing
- develop better dissemination networks with foreign cities
- prepare a sufficient project pipeline and be involved in more EU projects
- prepare more capital investments eligible for EU funding
- work much harder of dissemination and education related to sustainable development
- give more power to neighborhood councils and community organizations as they have a great role in transition
- include citizens in decision-making process

What can national government do?

- develop more efficient public administration system on national, regional and local level as it has a huge influence on program development and project implementation
- consider the use of innovation in order to simplify some processes and adapt them to the needs of today's society and thus speed up the transition
- accelerate development of national strategies that provide a framework for post/low carbon transition as in many cases local governments have to wait for national government to start defining their own development strategies which are often a precondition for implementation of projects
- accelerate enactment of laws and regulations that allow implementation of projects related to post/low carbon transition. Include citizens or groups that demonstrate interest or provide new solutions in decision-making process
- enable faster implementation of large-scale projects that have a significant impact on local community by giving more power to local authorities in project execution
- accept or develop more financial instruments targeting communities (territorial communities or specific interest communities) or NGO-s which have a substantial role in development
- National government is completely in charge for some sectors (e.g. education, health, pension systems) but maybe it should consider giving some flexibility to the regional and local governments to introduce their own systems or solutions (in case those are more ambitious)

- allow some changes in policies related to energy, start-ups, cooperatives, NGO-s
- start ranking cities according to their post-carbon development index
- ensure better cooperation between the cities and give more visibility to examples of good practices

What can EU do?

- make EU funding system simpler by skipping the national level as it sometimes takes too long and complicated for national governments to make all adjustments and documents which should be also transposed to regional and local levels.
- provide more financial sources for urban development and deploy more financial instruments intended for urban areas
- engage local level while developing its policies and involve cities in decision making process (as they are working the most on implementation of EU targets into concrete actions).
- monitor the fulfillment of targets within the urban areas and identify obstacles that appear exactly in the implementation of EU goals within urban of areas
- set more ambitious or specific targets for urban areas in general
- take into account the specificities of some states or cities when setting binding targets and allow tailor-made approach (e.g. growing/shrinking cities).
- ensure visibility and scaling-up of successful small-scale projects and initiatives that can sometimes even influence EU policies. Stimulate conduction of demo and pilot projects that aim to solve problems in the urban areas.
- Urban Innovative Actions are the good tool to support and institutionalize experiments in the urban areas. As well as URBACT they contribute to capacity building and innovations acceptance. UIA and URBACT budget should be increased to allow more cities to participate.
- develop more programs or instruments like CLLD or LEADER which directly serve the needs of community and self-organized groups within some territory.
- start ranking the cities according to their post/low carbon development index and publish the results regularly.
- continue Urban Audit with improved accuracy of the data collected.
- support development of initiatives and dissemination networks for low-carbon urban development. Improve cooperation between countries and cities in the field of urban development.