

## WORKSHOP REPORTS

### I.VI MILAN

The two scenario workshops held in Milan were organized about 2 months apart. An attempt to reconvene the same stakeholders in both workshops was only partly successful; due to time constraints some participants did not show up to the second appointment.

Workshop 1 was successful in terms of gathering feedback on the Initial Assessment indicator data and data sources, and in developing a vision of a post-carbon Milan in 2050. Stakeholders in attendance represented the municipal environmental agency, an energy company, the national institute of urban planning, a transport consulting firm, a regional environmental organization, a financial development agency, and the chamber of architects. The 8 stakeholders from Milan were motivated to engage in discussion and contribute their expertise throughout the day.

The day's events did not strictly follow the timeframe set out in the agenda. We allowed this flexibility to take advantage of times when stakeholders were interested to pursue further discussion on a specific topic. This gave us, the POCACITO team members, the opportunity to gather information when stakeholders were most willing to offer their expertise and feedback.

Four stakeholders attended Workshop 2 although many more had agreed to come. For this reason, we did not follow the 5 steps in back casting, but instead had an open discussion. Only one of the four participants had attended the previous workshop, so the others took some time to understand the project, our objectives, and the vision created during the previous meeting. We spent some time talking about the vision in general, and how it becomes less relevant if the municipal decision makers do not support the work or if there is not funding for the actions that we propose to meet the vision. One of the participants reiterated that there is already an extensive catalogue of projects/actions that would support the shift to a post-carbon city, and that these should be considered for the POCACITO project<sup>1</sup>. During the open discussion, some ideas regarding actions, milestones, and obstacles emerged. Finally, based on our notes from the discussion, we were able to organize the ideas developed according to their role in meeting the vision in the short, mid and long term. Unfortunately, we were not able to arrive at a point where discussing the vision under different scenarios was possible. This step first requires a very clear and concise set of actions and milestones that could be considered under varying socio-economic and climate conditions. The information collected during Workshop 2 was later organized by the POCACITO team to fulfill the 5 step objectives of the Back casting exercise.

### WORKSHOP DATES AND LOCATIONS

Workshop 1 was held on September 29, 2014 and Workshop 2 on November 27, 2014, both at FEEM's headquarters at Palazzo delle Stelline in Corso Magenta, Milan.

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<sup>1</sup> This catalogue had already been taken into account by the POCACITO team during the initial assessment

## PARTICIPANTS

Workshop organizers:

INSTITUTION	NAME AND SURNAME
Fondazione Eni Enrico Mattei (FEEM)	Margaretha Breil
FEEM	Cristina Cattaneo
FEEM	Andrea Bigano
FEEM	Katie Johnson

Stakeholders at Workshop 1:

INSTITUTION	NAME AND SURNAME
Agenzia Mobilità Ambiente Territorio (AMAT)	Maria Berrini
A2A Energia	Riccardo Fornaro
Istituto Nazionale di Urbanistica Lombardia (INU Lombardia)	Luca Imberti
TRT Trasporti e Territorio	Patrizia Malgieri
AMAT	Marta Papetti
Legambiente Lombardia	Damiano Di Simine
Finlombarda S.p.A., Direzione Energia	Dino De Simone
Ordine Degli Architetti: Pianificatori, Paesaggisti e Conservatori Della Provincia Di Milano	Alessandro Trivelli

Stakeholders at Workshop 2:

INSTITUTION	NAME AND SURNAME
INU Lombardia	Luca Imberti
Fondazione Lombardia per l'Ambiente	Mita Lapi
IEFE Università Bocconi	Edoardo Croci
Politecnico-Milano	Stefano Caserini

Participating stakeholders at Workshop 1 represented the municipal environmental agency, an energy company, the national institute of urban planning, a transport consulting firm, a regional environmental organization, a financial development agency, and the chamber of architects.

Only 1 of the stakeholders from Workshop 1 (Luca Imberti of INU Lombardia) returned for Workshop 2, although many more had expressed interest in attending. Many confirmed, then cancelled at the last minute, or failed to show up without informing the organizers. The participating stakeholders at Workshop 2 represented the national institute of urban planning, two Milan universities (one of the

university staff was a municipal deputy mayor for the environment in the previous local government), and a non-profit scientific organization.

## I.VI.I METHODOLOGY AND RESULTS FOR VISION BUILDING

### AGENDA

9:30	Stakeholders arrive
9:45	Presentation of the POCACITO project and workshop objectives
10:00	Introduction round (participants introduce themselves by taking one thing from their wallets to reveal something personal)
10:15	Presentation of the Initial Assessment results for Milan and Turin with interactive discussion
11:15	Coffee break
11:30	Vision Building exercise – drawing, summarizing visions with key phrases on cards, organizing cards using mind map
1:30	Lunch
14:30	Writing the 2050 vision based on the mind map results
16:30	Conclusion and coffee break

The techniques presented in the training workshop were utilized in Workshop 1. First, we introduced the POCACITO project, and then had participants introduce themselves by taking one item out from their wallet to explain how it represents them. Using this method for introductions was effective in breaking down barriers and allowing everyone to connect on a personal level. We chose this method of introduction, rather than having the stakeholders present one another, as some of them already knew each whereas others did not.

Presentation of the Initial Assessment results proved to be very useful. Due to time constraints (the workshop date was initially intended only for the presentation of the Initial Assessment and then changes to also include Visioning Building) there had not been any interaction with data providers and stakeholders previous to the meeting. The data and our analysis of the data were discussed throughout the presentation and agreed upon by all participants. We allowed for reaction to the data and feedback on data sources, and we received offers to provide additional or updated data. We agreed to circulate the presentation of indicators via email following the workshop so that stakeholders will have another opportunity to reflect on the data and the data sources.

For the Vision Building exercise, stakeholders were divided into two groups of four, with one POCACITO team member in each group. The other two POCACITO team members took notes and photos, helped keep things organized, and prepared for the next step of the process. The Vision Building exercise followed a three step process: participants were asked to sketch their vision of Milan in 2050, to identify key words and phrases describing or captured by the drawing, and to structure them using mind maps.

All stakeholders were timid to begin drawing the 2050 vision of Milan, not sure what to design or

afraid of what other participants might think of their design. The presence of several architects in the group created a strong disequilibrium in terms of capacity of expression in design and some participants initially opted for verbal expression rather than on designing. It took about ten minutes for stakeholders to fall into a casual conversation amongst their group members and to then begin sketching. Once they began, they were full of ideas and excited to continue with the exercise. Many insightful discussions emerged within the groups especially during the drawing and interpretation of the drawings. Both of the stakeholder groups then structured their ideas using a mind map and presented their ideas to the entire group. The results of the three parts of the Vision Building exercise produced the main themes (people, mobility and transport, environment, land use, energy, and innovation and technology) and ideas of what Milan could potentially look like in 2050.

Lunch was held at a restaurant within the same building, but in a different room. As we had a group of 12, we were able to sit together around one big table to have lunch together. This atmosphere was very conducive to maintaining a focus on the workshop topics and objectives. Discussions relevant to the workshop objectives carried on throughout lunch.

Unfortunately, we lost most stakeholders after lunch. This was a minor problem as the mind maps had already been discussed before lunch while all participants were still in attendance. With the four POCACITO team members and remaining two stakeholders we were able to synthesize the results of Vision Building exercise and still include all of the views proposed throughout the earlier phases of the exercise. In several occasions we even decided to keep wording as preferred by one of participants that had already left.

Following Workshop 1, the Initial Assessment indicators and results of the Vision Building exercise were emailed to all stakeholders for their comments and review. Several replied with additional information on the indicators (i.e. the municipal environmental agency supplied updated figures on energy efficiency, emissions, transport, etc.). Additionally, with the permission of the stakeholders, we added the Workshop results and photos to the POCACITO website and provides the link to all participants, as well as interested parties who were unable to attend.



## MAIN SECTORS IDENTIFIED IN VISIONING A FUTURE FOR THE CITY

The six primary sectors identified in the 2050 vision for Milan include social issues, mobility and transport, environment, land use, energy, and innovation and technology.

## THE 2050 POST-CARBON VISION FOR MILAN

The 2050 post-carbon vision for Milan, as proposed by city stakeholders, covers a wide range of issues. Because of the long time frame, the vision is rather broad and general. Additionally, although stakeholders were asked to consider the relationship between Milan and Torino, they did not give much thought to the potential of the two cities sharing a common post-carbon future. A potential area for the two cities to work together was only explicitly stated in the sector of technology and innovation.

### SOCIAL ISSUES

- Sensitive to environmental and energy issues, where citizens have reached a high awareness of their consumption and behavior
- Services nearby, with greater reach and usability
- Participative city society that is open to the world and thereby richer
- More livable city for all

### MOBILITY AND 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
- Integrated transport systems
- Carbon-free transport

### ENVIRONMENT

- Reuse and recycling of materials
- Endowment of green space, which helps to create a micro-climate that reduces the heat island effect; green is integrated into the urban fabric and connects to the territory
- Rich in biodiversity

### LAND USE

- Dense, spacious, and highly populated city
- More permeable surfaces

### ENERGY

- Very 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

#### INNOVATION AND TECHNOLOGY

- Integrated technology systems and networks that clearly and effectively support all aspects of daily life; promote telecommuting, access to services, and reduce the need to travel
- Milano / Torino drivers of innovation

### I.VI.II METHODOLOGY AND RESULTS FOR BACK CASTING SCENARIOS

Workshop 2 did not follow the Back casting methodology as closely as Workshop 1 followed the Vision Building methodology. However, a rich discussion with stakeholders provided enough input to uncover some obstacles and opportunities, milestones and interim projects, and actions along the road for Milan to transition to a post-carbon city under a business as usual scenario.

#### METHODOLOGY FOR BACK CASTING WORKSHOPS

##### AGENDA

10:00	Welcome
10:10	Introduction of participants
10:20	Presentation of the 2050 vision
10:40	Step 1: define normative end point
11:30	Coffee break
11:50	Step 2: consider obstacles and opportunities
12:45	Step 3: identify milestones and interim projects
13:20	Lunch
14:35	Step 4: identify actions that need to be taken
15:35	Step 5: validate the robustness of strategies
16:20	Conclusions and next steps
16:30	End

Because few stakeholders attended Workshop 2, we did not follow the 5-step back casting methodology, but instead had an open discussion. We spent a lot of time talking about the vision in general, and how it is not relevant if the municipal decision makers do not support the work or if there is not funding for the actions that we propose to meet the vision. During the open discussion, some ideas regarding actions, milestones, and obstacles emerged. Finally, based on our notes from the discussion, we were able to organize some of these ideas that would signify progress in meeting the vision in the short, mid and long term. Unfortunately, we were not able to arrive at a point where discussing the vision under different scenarios was possible.

## KEY POINTS OF THE VISION

In the 2050 post-carbon vision for Milan, people will be sensitive to environmental issues and use accessible services with a low carbon footprint. The city will be dense, spacious, green, suitable for pedestrians, and use carbon-free transport. The energy sources will be renewable, with energy efficient technologies employed.

The six sectors identified in the Vision Building exercise (social issues, mobility and transport, environment, land use, energy, and innovation and technology) were focused into four policy fields in the Back casting exercise. The four policy fields are energy, waste, mobility and transport, and land use and environment. Several cross cutting issues were also identified as being relevant for each of the policy areas and the overall 2050 post-carbon vision.

The timeframes of actions were discussed only implicitly with stakeholders. Timeframes were then translated into approximate time horizons ex-post by FEEM's POCACITO team. Short-term actions might occur from present day up to 2020, mid-term from 2020 to 2035, and long-term actions anytime between 2035 and 2050.

CROSS CUTTING THEMES	
<p><b>Milan as a post-carbon city, with a green economy, continuously enhancing economic, environmental, and social well-being. This includes a general “change in direction” from current patterns of consumption and emissions.</b></p>	
Obstacles	In general, there are no plans for logistics associated with pursuing a 2050 or post-carbon vision. A long-term strategy of policy-makers is lacking for energy, waste, mobility and transport, and land use and environment.
	There is a lack of policy for science that could help foster the scientific inputs for innovation.
	In all cases, there is the question of who pays. (Although in the case of the municipality of Milan, access to alternative (international) funding might to some extent help overcome some of the financial shortcomings, there is a lack of municipal funds in smaller towns.)
	Local administrations might not have the capacity or skills to draw on existing innovative and/or financing tools.
Opportunities	Good projects can attract European funding. Additionally, international projects with strategic fundraising opportunities are available (i.e. initiatives for Smart cities and similar projects, some of which have already been accessed by Milan). Other modes of innovative finance exist. These opportunities are more easily ceased by big centers, whereas small towns have more difficulties in accessing international funding and setting up projects to be funded.
	The co-benefits of climate and other policies can be exploited. Climate policy can be "sold" along with other objectives, which produce more obvious benefits to citizens,

	to make it more attractive (e.g. air quality).
	The scientific community of Lombardy is well equipped to tackle the climate change. They are in a position to provide leadership and spur action. Science has the potential to drive policy.
	The theme of Milan EXPO 2015 is Feeding the Planet, Energy for Life. Therefore there is some attention given to the idea of sustainability, which links to climate change. This can be used to bring attention to the transition to a post-carbon city.
	National commitments on a new climate deal will likely come out of COP21 in Paris in 2015. Emissions reductions targets set at the country level will support plans for emissions reductions at the local level.
	Milan does not have a lobby pushing carbon.
	Sponsorship of EU funded projects.
	In 2015, the city approved the Sustainable Urban Mobility Plan (Piano Urbano della Mobilità Sostenibile – PUMS), which provides a path of participation open to the city and any interested institutional or non-institutional stakeholders. Guidelines for PUMS have been approved by the City Council and a ten-point <sup>2</sup> path has been laid out to build the Milan of the future. A Strategic Environmental Assessment process will work to integrate aspects of environmental sustainability during any updating of the Plan.
	In 2014, the city approved the guidelines for starting the process of drafting the Plan of Action for Sustainable Energy (Piano di Azione per l’Energia Sostenibile – PAES) and its strategic environmental assessment (SEA). PAES is the document planning and scheduling policies to reduce greenhouse gas emissions, which the City Council is preparing for the European Commission initiative called Covenant of Mayor <sup>3</sup> .
	Participation in the Covenant of Mayors. The Covenant of Mayors is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources. Covenant signatories aim to meet and exceed the European Union 20% CO2 reduction objective by 2020. Financial programs and incentives are available to signatories to help them develop Sustainable Energy Action Plans and help them meet their emissions reductions goals.
Milestones	Goals for emission reduction reached in time (PAES target: 20% by 2020, compared to the baseline year 2005).
	Citizens change their lifestyles and become more sensitive.

<sup>2</sup> See Mobility & Transport interim projects for ten-point plan.

<sup>3</sup> [http://www.covenantofmayors.eu/about/covenant-of-mayors\\_en.html](http://www.covenantofmayors.eu/about/covenant-of-mayors_en.html)



Actions	It is best to work with small, short-term goals. Once one is achieved, move to the next. Start with existing projects and add small changes at lower costs.
	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>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.</li> <li>Take advantage of financing tools and opportunities available through the affiliation with the Covenant of Mayors.</li> </ul>

ENERGY	
District heating and cooling with renewable energy sources for all households	
Obstacles	Private investments in energy efficient heating/hot water systems now will discourage people from investing in a new technology once it is ready in several years. They will not want to spend more money on something they have already upgraded.
	Some existing regulations will hinder progress on alternative non-carbon energy projects, i.e. no solar panels on roofs in the historical center.
	The existing paradigm must change from making carbon use more efficient to zero-carbon oriented.
	Energy efficiency has small margins for improvement in the existing building stock.
Opportunities	The capacity to produce more electricity than is necessary (e.g. with solar panels) allows excess producers to feed energy back into the grid. Development of new technologically innovative applications in the future will likely increase energy efficiency and/or decrease energy consumption and open new efficient ways into renewable energy.
	A2a (the Milan multi-utility providing public services for energy, waste, water, etc.) is actually planning to invest in using industrial waste heat.
Milestones	<p>EU targets for 2020:</p> <ul style="list-style-type: none"> <li>20% reduction in GHGs</li> <li>20% final consumption met with renewable sources (use electrical, thermal and transport)</li> <li>20% reduction in consumption of primary sources compared to the forecast trend, by increasing efficiency</li> </ul>
	<p>National targets for 2020:</p> <ul style="list-style-type: none"> <li>13% reduction in GHG emissions in non-ETS sectors compared to 2005</li> <li>17% final consumption of energy through renewable sources</li> </ul>

	<ul style="list-style-type: none"> <li>• 10% transport consumption met by renewable energy</li> </ul>
	<p>Regional objective for 2020:</p> <ul style="list-style-type: none"> <li>• 11.3% final consumption of energy from renewable sources</li> </ul>
	<p>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).</p>
	<p>The number or percentage of households or the city connected to the district heating/cooling network can be used to measure progress.</p>
	<p>The city is using more renewable energy than carbon energy sources.</p>
	<p>One hundred percent of new buildings are zero energy or carbon neutral.</p>
Interim projects	<p>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.</p>
	<p>Create micro tri-generation (heating, cooling, and energy production) plants as pilot projects for big public and private energy users (hospitals, schools, etc.).</p>
	<p>Measures of energy recovery from the integrated water cycle using heat pumps to heat buildings near (or in) industrial wastewater treatment plants.</p>
Actions	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>• Promote and encourage the use of solar thermal, photovoltaics and geothermal heat pumps (PAES).</li> <li>• Identify regulatory measures, create incentives, and train citizens to reduce electricity consumption and emissions in public and private buildings (PAES).</li> <li>• 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).</li> <li>• Create regulations for increasing energy efficiency for buildings taking into account characteristics of existing buildings.</li> <li>• Set electric energy standards.</li> <li>• Give incentives for carbon free energy production and consumption.</li> <li>• Power public lighting with lost energy consumption.</li> <li>• Reduce public switching time.</li> <li>• Communicate the economic benefits derived from equipment conversion toward district heating, heat pumps, and solar and thermal energy.</li> </ul>

	<p><i>Short to mid-term:</i></p> <ul style="list-style-type: none"> <li>• Develop smart infrastructure and buildings to consume less energy.</li> <li>• Build smart grids.</li> </ul>
	<p><i>Mid-term:</i></p> <ul style="list-style-type: none"> <li>• Create a network for district heating and cooling.</li> <li>• Develop decentralized system of power/heating/cooling plants.</li> </ul>
	<p><i>Mid to long-term:</i></p> <ul style="list-style-type: none"> <li>• Develop new technologically innovative applications that will support co-generation and tri-generation.</li> </ul>

WASTE	
<b>Circular economy</b>	
Milestones	The percentage of waste reduction or percentage of materials recycled can be used to measure progress.
Interim projects	Effective waste management.
Actions	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• Increase waste sorting (PAES). Make the separation of waste and recyclables more user-friendly and more efficient.</li> <li>• 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).</li> </ul>

MOBILITY AND TRANSPORT	
<b>Public transport services more convenient than private transport</b>	
s t a t	The attitude of the FS railway society hinders the convenience of taking the train

	<p>due to regular delays and strikes.</p> <p>Lack of coordination between transport systems.</p> <p>Centralized outlay of the network – the circular line connecting periphery areas to each other is no longer in existence and is impossible to re-established because too much has been built upon.</p>
Opportunities	<p>Development of new technologically innovative applications will likely improve attractiveness of public transportation.</p>
Milestones	<p>Creation of an integrated public transport system.</p> <p>A more widespread network of public transport, including extension of the circular lines to connect outlying areas.</p> <p>Public transport becomes faster and less expensive than private transport.</p>
Interim projects	<p>Sustainable Urban Mobility Plan (PUMS):</p> <ul style="list-style-type: none"> <li>• Set a vision for the subway system.</li> <li>• Develop infrastructure for public transport.</li> <li>• Enhance rail service.</li> <li>• Make sustainable accessibility to new areas of urban transformation.</li> <li>• Raise levels of security, spreading pedestrian areas and environmental islands</li> <li>• Facilitate and support cycling. Create bike, also electric bike, sharing projects to provide alternative options to taking one’s own car.</li> <li>• Rationalize the use of motor vehicles, i.e. Area C sharing systems and smart solutions.</li> <li>• Make the parking system more efficient.</li> <li>• Promote the development of a new urban freight logistics.</li> <li>• Overcome barriers and make the city more accessible for everyone.</li> </ul> <p>Urban Traffic Plan (Piano Urbano del Traffico – PUT): The PUT consists of a set of coordinated interventions for improving conditions of road traffic in the urban area, pedestrian access, public and private transport. Goals are achievable in the short term (i.e. 2 years), and do not require any changes to infrastructure. PUT aims to: improve traffic circulation; improve road safety, such as reduction of road accidents; reduce air and noise pollution; and save energy.</p> <p>Triennial Program of Local Public Transport Services (Programma Triennale dei</p>

	<p>Servizi di Trasporto Pubblico Locale – PTS): The objectives of PTS are to: improve the quality of the service offered, promote integration between services, promote exchanges with rail services, meet the demand and capacity, and promote the environment through encouragement of the use of the public transport and innovative technologies.</p>
	<p>Urban Car Park Program (Programma Urbano dei Parcheggi – PUP)</p>
<p>Actions</p>	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>• Strengthen and make public transport services more efficient, and encourage sustainable mobility (e.g. bicycle, electric, car sharing) (PAES).</li> <li>• Develop informatics infrastructure including smart stops and smart times for public transportation on busses, trains, and trams.</li> <li>• Extend road pricing to encourage use of public transport and discourage private car use.</li> <li>• Limit car use through extension of pedestrian areas, speed limit zones, parking payment.</li> <li>• Make preferential lanes for people who are carpooling.</li> <li>• Create park and ride parking lots.</li> </ul>
<p><b>Carbon free private and public transport</b></p>	
<p>Obstacles</p>	<p>There are currently few charging points for electric cars both within and outside of the city.</p>
	<p>Electric cars are only truly zero carbon if the method of generating energy is also zero carbon (not good if it is done using coal).</p>
	<p>Public resistance, lack of infrastructure, and rapid technology change inhibit transition to electric car use.</p>
	<p>Infrastructure requirements and options, especially in congested areas include on street versus off street charging points, standard/fast/rapid charging, and the source of green energy.</p>
<p>Opportunities</p>	<p>Awareness can be raised through the Electric Vehicles in Urban Europe project.</p>
<p>Milestones</p>	<p>All (or a certain percentage of) cars are electric.</p>
	<p>There are a sufficient number of electric car charging points inside and outside the city.</p>
<p>Imp</p>	<p>Increase number of charging points</p>

	Create incentives for buying electric rather than gasoline-fueled vehicles.
	Create a new policy framework with incentives, parking and congestion implications, and modal shift.
Actions	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>Marketing and communication, and education and awareness raising on the benefits of electric vehicles.</li> </ul>
	<p><i>Short to mid-term:</i></p> <ul style="list-style-type: none"> <li>Substitute municipal vehicle fleets with new ones that use clean technologies.</li> <li>Add more electric car charging points (serviced by renewably produced energy).</li> </ul>
<b>Efficient distribution of goods within the city</b>	
Obstacles	Private organization of transport.
Milestones	Electric transport used for the distribution of a certain percentage of goods throughout and within the city can be used to measure progress.
Interim projects	Organize and develop the logistics of the last mile for the distribution of goods in the city.
Actions	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>Enact road pricing to support more efficient distribution of goods within the city.</li> </ul>

## LAND USE AND ENVIRONMENT

### More green and blue spaces

Obstacles	The creation of more green and blue areas is dependent on existing land use and development.
Opportunities	Rehabilitation of deprived or derelict areas can provide more green space within the city.
	Ecological zones can provide habitat for more biodiversity.

	Green areas can help provide a link to the surrounding suburbs.
	Expo 2015 is creating and transforming existing urban spaces.
Milestones	The number of parks opened, percentage of permeable surfaces, or waterways re-opened can be used to measure progress.
Interim projects	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.
	Create pedestrian areas in the periphery of the city, especially to link the center to surrounding suburbs (make sub-centers in the periphery more attractive). Create the “green mile”.
Actions	<p>Mid to long-term:</p> <ul style="list-style-type: none"> <li>• Increase the concentration of production/industrial areas and structures, as this allows for better organization of transport logistics.</li> <li>• Re-open some of the city’s waterways.</li> </ul>
<b>Citizens are not only consumers but also guardians and custodians of the urban and peri-urban territory</b>	
Obstacles	There is a low level of awareness of the citizens.
	There is a low level of awareness of the governing parties.
	Existing interests (real estate) support current trends.
	There is pressure on politicians to continue with current policies, not to invent new ones.
	Questions of responsibility and ownership with respect to public and derelict spaces
Opportunities	Initiatives for taking care of public spaces started by neighborhood initiatives
	Neighborhood initiatives fighting for improvements in their areas
Actions	<p><i>Short-term:</i></p> <ul style="list-style-type: none"> <li>• Educate citizens on their role and responsibilities as members of the city.</li> <li>• Provide occasions for citizens to design and manage open spaces in their neighborhood</li> </ul>
	<i>Mid-term:</i>

- Rehabilitate deprived areas by creating eco-districts

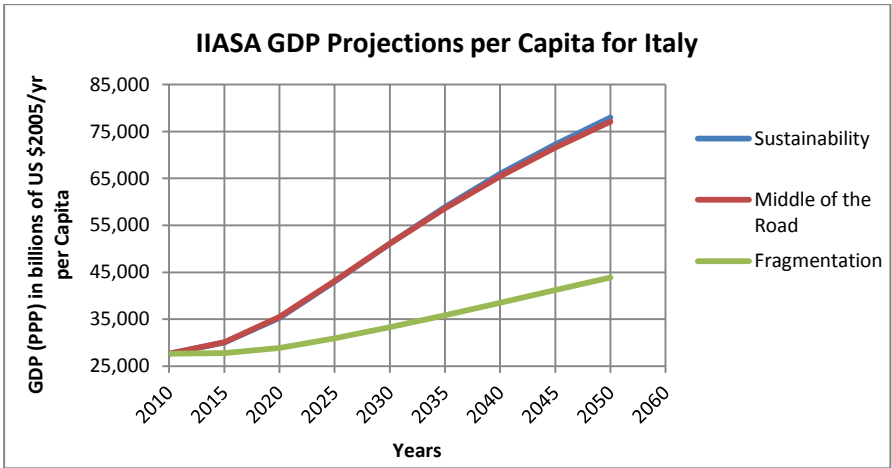
### BACKGROUND SCENARIOS

Background scenarios were not explicitly discussed during the Back casting exercise; the idea that the future may unfold in a way other than business as usual was noted but not considered in detail. Instead, stakeholders focused on the future under a business as usual scenario. Although they were not presented, GDP, national population, and urban population projections were made for Milan under three socio-economic scenarios: sustainability, middle of the road, and fragmentation. Business as usual corresponds with the middle of the road scenario.

The Sustainability Narrative describes a world that aims at pursuing a sustainable development path to achieve development goals while reducing resource intensity and fossil fuel dependency. Environmental awareness is at a high level and technology is developing fast with strong economic growth, both in high and in low-income countries.

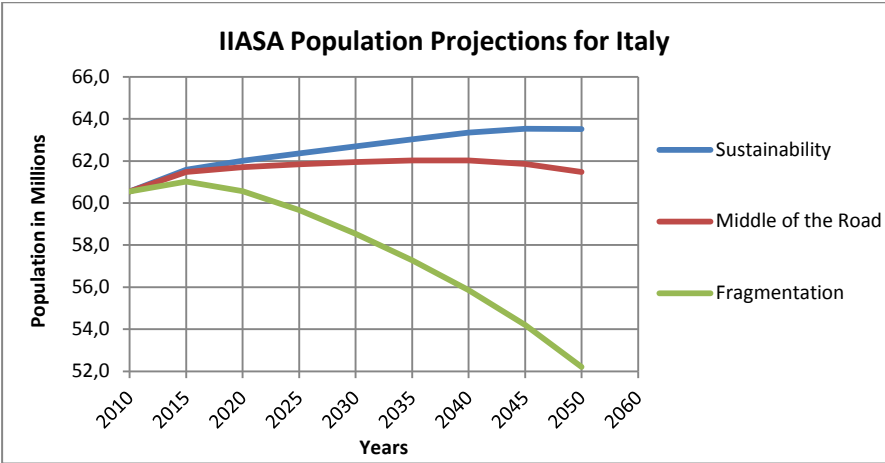
The Middle of the Road Narrative describes a “business-as-usual” world with the trends typical of recent decades continuing and some progress toward achieving development goals being made. Dependency on fossil fuels is slowly decreasing. Development of low-income countries proceeds unevenly.

The Fragmentation Narrative describes a world that is separated into regions characterized by extreme poverty, pockets of moderate wealth and a large number of countries struggling to maintain living standards for a rapidly growing population.

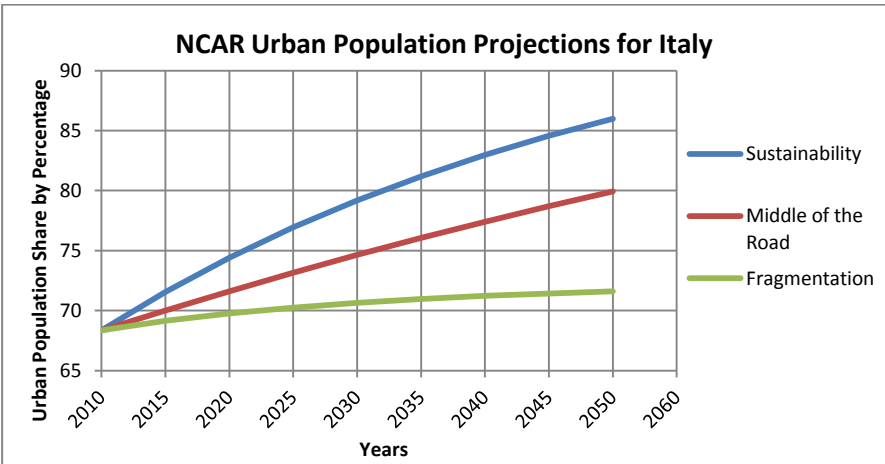




This graph shows that GDP per capita is projected to greatly increase between now and 2050 in Italy under the Sustainability and Middle of the Road scenarios. For the Fragmentation scenario, the projected growth occurs at a lesser rate.



For the Sustainability scenario, the graph shows population increasing slightly until 2045, then decreased until 2050. Population increases slightly until 2040, then decreases until 2050 under the Middle of the Road scenario. For the Fragmentation scenario, the graph shows population decreasing between 2015 and 2050.



In all three scenarios, this graph shows urban population projections increasing between now and 2050. In the Fragmentation scenario, the increase is slight. The increase for the Sustainability scenario is greatest, and the Middle of the Road scenario is somewhere in between.

### ROBUSTNESS OF ACTIONS

Due to constraints on the number of stakeholders present at Workshop 2 and the level of progress made during the Back casting exercise, we were not able to arrive at a point where discussing the 2050 post-carbon vision for Milan under different socio-economic scenarios was possible.

An ex-post analysis of the back casting results shows that financing opportunities, political support, and the citizens’ consciousness of environmental issues would be the biggest differences under fragmentation or sustainability scenarios. In the sustainability scenario environmental awareness is

very high, technology is developing fast, and economic growth is strong. In the fragmentation scenario the opposite is true. Therefore the potential for Milan to transition to a post-carbon city is even stronger under a sustainability scenario than the business as usual or middle of the road scenario. It will be much more challenging under fragmentation, as awareness, technological support, and funding for a transition to a post-carbon economy will be very limited, and politicians will have other urgent social and economic issues to address.

## FEASIBILITY

The feasibility of implementing the post-carbon vision depends greatly on the socio-economic scenario as well as climate change. The future of the economy, politics, technological innovation, and climate impacts are uncertain over a timeframe of 35 years. It is fair to say that the post-carbon vision for Milan is most feasible under the Sustainability scenario and least feasible under the Fragmentation scenario. Some actions, especially those already underway or planned in the short-term will be achievable under any scenario, but the practicality of those projects and actions planned further in the future will be more dependent on the socio-economic situation at that time.

### I.VI.III GENERAL REMARKS

Overall, the Vision Building and Back casting workshops were successful in developing a 2050 post-carbon vision for Milan. The stakeholders were interested and involved in the exercises and discussions, especially in Workshop 1. They helped to define future goals towards becoming a post-carbon city in terms of social issues, mobility and transport, environment, land use, energy, and innovation and technology. These six sectors were focused into four policy fields: energy, waste, mobility and transport, and land use and environment. Stakeholders identified the obstacles and opportunities, milestones and interim projects, and actions towards achieving the vision in each policy field in the short, mid, and long-term under a business as usual scenario. While the robustness of the 2050 vision was not analyzed in depth, it is clear that vision is most feasible in a world where environmental awareness is very high, technology is developing fast, and economic growth is strong, and least feasible where awareness, technological support, and funding for a transition to a post-carbon economy are limited. The potential for growth and collaboration with Turin in achieving a post-carbon vision was considered, yet stakeholders were not fully convinced about the inter-linkages between the two cities, but suggested that the cities may be able to collaborate on technological innovation for energy efficiency in the future.