



**ClairCity: Citizen-led air pollution reduction in cities**

# **D4.16 Mutual Learning Workshop Analysis Report**

**October 2018**

# 1 Document Details

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<b>Description</b>	<p>This deliverable is the follow up of D4.14 Mutual Learning Workshop Complete – First City (Bristol) delivered in August 2017. D4.15 Mutual Learning Workshop Complete – Last city summarises the Mutual Learning Workshops (MLW) held in the other pilot cities (Amsterdam, Sosnowiec and Ljubljana) and regions (Liguria and Aveiro). The MLW brought together expert stakeholders to share and discuss transport- and heating policies, and derived health risk factors in a changing city environment, now and in the future (2020-2030-2050). This analysis report contains the general concept of the MLW and its role in the ClairCity project, the involved stakeholders, the main drivers of the city development, the data and relevant information on the future visions (2030, 2050), the summary of the proposed policy instruments and technical tools by the stakeholders in Bristol, Amsterdam, Ljubljana, Sosnowiec, Aveiro and Liguria at the MLW, the overall scenario outputs and conclusions. The differences in reporting are since each city / region tailored the workshop to the local needs and context. All participants of the MLW signed consent forms allowing us to mention their names and use the pictures taken at the workshops for our deliverables. The individual MLW reports for each city are uploaded onto the ClairCity website.</p>

# 2 Version History

<b>Version</b>	<b>Updated By</b>	<b>Date (planned)</b>	<b>Changes / Comments</b>
V1	Various authors (see 'Contributions and Acknowledgements')	14/09/18	Version 1 based on the MLW report of the 4 cities and 2 regions
V2	Eva Csobod, Peter Szuppinger	10/10/18	Update of the structure of the report
V3	Various authors (see 'Contributions and Acknowledgements')	26/10/18	Update of the report based on the feedback of the experts of the project
V4	Final draft version of the report	29/10/18	Update according to the review

### 3 Contributions and Acknowledgements

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## 4 Executive Summary

The activity belongs to the work package Citizens and Stakeholder Engagement, Task 4.4 – Citizens and their Health, Task 4.4.1 Mutual Learning Stakeholder Workshop. The aim is to empower citizens to better understand the specific challenges and opportunities that their city currently offers and engage them into moving towards reducing pollutants emissions and carbon footprints, improved air quality and decreased health risks. This is achieved as part of overall perceptions and ideas of citizens on sustainable lifestyles and a *'better quality of life'* within their city and region in the future. The main outcomes will support the policy development of the cities and regions on scenario building towards 2050 in the field of integrated city planning based development, air quality improvement, and climate change adaptation and mitigation.

The REC (WP4 lead) designed the Mutual Learning Stakeholder Workshop (MLW); content, methodology, structure, the potential stakeholders and timeframe. The MLW was implemented by the partners and cities/regions of the project. The first MLW was organised in Bristol in July 2017. UWE and the Bristol City Council adapted the proposed method described in the MLW Guidelines (see in the Annex of the D4.14) to the local needs and conditions. After Bristol, Amsterdam, Ljubljana, Sosnowiec and two regions Aveiro and Liguria completed the MLW workshop with success. The outcomes, the proposals of the MLW participants for future scenarios (policy tools and measures) can contribute to the Stakeholder Dialogue Workshops in the cities/regions in autumn 2018/spring 2019, the WP6 on Policy and WP7 on Scenario building. In total 151 participants were involved in the MLWs.

The main results of the current analysis address the possible policy tools and measures on sustainable lifestyles and a *'better quality of life' in the cities and regions*. The specific tools on energy use, transport and mobility, air quality improvement, climate change mitigation and governance as possible future options are proposed for policy makers of the cities and regions.

## 5 Mutual Learning Workshops

### 5.1 MLW Concept and role in the project

The MLW is designed for different stakeholders who are engaged in environment, health issues and policies in Bristol (reported in D4.14), Amsterdam, Ljubljana, Sosnowiec, Aveiro and Liguria region and ready to participate in the MLW (reported in D4.15). The participants of the workshops were different stakeholders, selected NGOs, social city groups, health and environmental organisations, universities, relevant department of the pilot cities, who are involved in the air quality, public health and carbon management issues, planning and activities in the city (local level), or at regional and national level.

The role of the Mutual Learning Workshops in the ClairCity project is to share and discuss the health risk factors of the changing city environment. The workshops can reflect on the multi-disciplinary context and preventive measures of air quality, climate change and health issues among stakeholders. The mutual learning workshop provides the opportunity for exchange of national/local/city systems and practices in health, environment and innovation (e.g. smart cities). This can create further innovative tools for mutual learning in the context of cities to improve air quality, reduce carbon footprint and improve public health (with special attention given to children and senior citizens) in long run. The outcomes of the workshops as innovative tools will be shared with the associated cities to exploit the innovation within the project.

Civil society and NGOs are already actively contributing to air quality improvement and carbon footprint reduction in a number of ways. Air pollution is usually not a stand-alone topic in this context, but part of a more holistic approach focusing on health and liveable cities. At present the largest source of particulate, NO<sub>x</sub>, O<sub>3</sub> and other emissions come from motorised transport in European cities, therefore the analysis can give significant attention to relevant activities and measures focusing on urban mobility and energy use.

### 5.2 Workshop Aim

The aim of the workshop was to develop routes to a “clean air”, healthy city/region by understanding specific challenges and opportunities for organisations, and engaging them to identify actions, milestones and priorities towards 2050.

### 5.3 Guideline: How to prepare the Mutual Learning Stakeholder Workshop?

The Guideline was presented in the D4.14. It was used in the implementation of the MLW in all cities and regions. The adaptation of the Guideline to the local conditions was discussed by the city teams and the project partners in the cities and regions.

We can conclude that the MLW Guideline was very useful for preparation and facilitation of the MLW in the cities and regions.

In some cities the Guideline was translated to the local language. But in most cases the English version was used.

## 5.4 Recommended agenda of the MLWs

REC designed a 'draft agenda' for the MLW. See below the plenary and group work sessions. The detailed agenda of the six MLWs are reported in the D4.14 and D4.15. The proposed design of the agenda fits to the goal of the MLW. The workshop program is motivating for the participating stakeholders for joint thinking and planning on the future of their city.

1. The proposal for the Plenary 1 session (60 min) was introduction and presentation of the overall context of air quality, climate change/management and health impacts on national and city level. Two selected keynote speakers were asked to focus on the current health risk factors and the quality of the city environment.
2. After the plenary the Walking session (40 min) was proposed. The mutual learning workshop participants (stakeholders) were asked to prepare a poster before the workshop and present at the walking session. Proposal for the topic of the posters: the current and possible future trends on health and environmental issues in the city/regions. After the plenary presentation the walking session served to see the posters about the major issues and future trends in the city/region. If the participants did not prepare posters about the problems in the city, brochures or other communication tools were used.
3. Setting up the stage of scenarios session (40 min): After the poster walking session the moderator of the session was asked to moderate the discussion on the future scenario settings: priorities and targets for 2020-2030-2050.
4. After a short break the scenarios sessions started in small groups. The participants worked in 3-5 groups (possible scenario for 2020, 2030, 2050) and discussed the problems and possible actions towards the actual scenario reflecting on the priorities and targets.
5. The Plenary 2: After the group discussion the groups presented the future scenarios, the proposed actions and innovative tools/measures including policy options. The plenary 2 finished with the Conclusions and closing words. What is the benefit of mutual learning today and in the future on air quality, carbon management and public health? How to keep running joint learning and action? These questions were discussed.

More details about the agenda and speakers are in the individual city/region report on the project website.

## 5.5 Facilitators

The facilitators of the workshops were selected from the partners and the city/region coordinators of the project. Please, see the list below.

- Eva Csobod, WP4.4.1 task coordinator (REC)
- Gabor Heves, Peter Szuppinger, task facilitators (REC)
- Amsterdam: Hans Bolscher (moderator), Irati Artola (Trinomics), Stephen Slingerland (Trinomics), Imke van Moorselaar, Rob van Strien (GGD)
- Aveiro Region: Myriam Lopes, Vera Rodrigues, Sílvia Coelho, Joana Ferreira (University of Aveiro), Olgra Cravo, CIRA
- Bristol: Emily Prestwood, Enda Hayes, Jo Barnes, Corra Boushel, Laura Fogg-Rogers (UWE), Andy Edwards, (Bristol City Council) (Mark Leach, BCC)



- Liguria Region: Rita Vaccaro (Techne), Partrizia Costi (Liguria Region)
- Ljubljana: Sabina Popit (Municipality of Ljubljana), Nadja Zeleznik (REC)
- Sosnowiec: Barbara Kossowska-Siwiec, Edyta Wykurz, Ewa Karaban (Municipality of Sosnowiec) Barbara Grzebulska, REC Poland.

## 5.6 Participants and organisations

Participants of the workshops were from a range of organisations: City Council, NGOs and campaign groups, health and environmental organisations, partnerships and consultancies, businesses, universities, and transport providers. The detailed participant lists are in the individual city/region reports.

The engagement of civil society in shaping the future of the city and the access to healthy and sustainable lifestyle is important factor of the city development. NGOs have the tools to raise awareness and mobilize citizens locally, therefore putting decision-makers under some pressure. Many civil society initiatives are concerned with neighbourhood-level problems and local quality of life, therefore they also support local environmental decision making through the encouragement of citizen participation, data transparency, accountability and by sustaining the values of the Aarhus Convention on public participation.

Participants were invited through number of routes (invites included a link to register for the workshop on Eventbrite), coordinated by the city/region contacts by invitation letter, via email and direct calls. Social media was used for information delivery about the events. This approach was successful in most of the cities. Of course, through the direct invitation resulted the most beneficial participation.

The MLW is designed for different stakeholders who are engaged in environment, health issues and policies in Bristol, Amsterdam, Ljubljana, Sosnowiec, Aveiro and Liguria region and ready to participate with their inputs in the MLW. The number of the participants: Amsterdam: 20, Bristol:34, Ljubljana: 16, Sosnowiec: 24, Aveiro Region: 22, Liguria Region: 35. In total 151 participants were present at the mutual learning workshops in Amsterdam, Ljubljana, Sosnowiec, Aveiro and Liguria region.

## 5.7 Logistics and resources

The proper logistics and relevant resources are important framework for the MLW. In most cases two rooms were used for the workshop, namely one set up for a discussion with two/three keynote speakers and one set up for the poster creation and group work.

The formalities of the workshop fit to the requirement of the H2020 research project: Participant sign-up sheet, the Consent forms, the Participant information sheets, the large posters for Amsterdam, Bristol, Ljubljana, Sosnowiec, Aveiro and Liguria region 2020, 2030, and challenges and barriers of the cities/regions towards 2050.

## 6 Framework for the analysis of the MLWs

An overall appraisal of the workshops indicates that proper participants were involved and they mutually learned and discussed the air pollution problems, the health impacts and carbon emission reduction options. The keynote speakers provided a good amount of information across air pollution, public health, sustainable transport and climate change on national and local level. There is a good opportunity to continue the mutual learning of stakeholders after the workshop by making the talks and posters available online. A few representatives of the MLWs go for the Stakeholder Dialogue workshops in June 2018 - March 2019 to present the views on the future of the city/region and bring the conclusion of the MLWs including the policy tools for change.

A challenge of the workshop was supporting the groups to turn their attention to definite “actions” in the scenario session at the end. For some attendees it took time to change their focus from talking about the issues to talking about the needs, challenges and real goals in the future. The complex topics required more time for discussion on future scenarios. The facilitators had an important role on summarising and presenting the action lists to allow for a better comparison and discussion between the groups in the feedback session on the city/region in 2020, 2030 and 2050.

The feedback from the MLW participants was largely positive, highlighting in particular the opportunity to talk to people from different sectors and organisations they rarely talk to. Many participants have stated that they would like to be part of a shared workshop email contact list and follow the activities of the ClairCity project.

The framework for analysis of the MLW contains the next structure:

- 1.Vision; attendees were asked to imagine how their city/region would look in 2050 including any changes they expect to see.
- 2.Priority actions (policies): proposed measures by most of the participants which are priority actions/ policies.
- 3.Milestones: participants were asked to identify some targets that needed to be reached by a date (milestones).
- 4.Barriers and challenges: participants recognised issues that present a barrier or challenge to acting or implementing policies.
- 5.Conclusions: the overall conclusion of the MLW including the vision and the policy actions.

## 7 MLW in Bristol

### 7.1 Vision

*The vision for a clean air, low carbon, healthy Bristol in 2050.*

The Bristol MLW attendees were asked to imagine how Bristol would look in 2050, including any changes they expect to see. The presentations of the transport, health and climate change experts at the beginning of the MLW gave good input for common thinking of the participants about the future of Bristol.

Input by the speakers: There were three presentations at the beginning of the workshop. The first speaker focused on 'A Critical View of the Four Key Transitions in the Mobility Sector'. The speaker gave a short overview of the key transitions in the transport sector and some of the challenges in the future: electrification; automation and interconnection; more flexible supply and user choices; more sharing of vehicles. The second presenter talked about 'The need for long term planning and investment in health'. The speaker highlighted the need to consider the long-term impact of environmental factors, including air pollution, in health planning and policy to challenge the current short-term, inadequate thinking in terms of investing in health. The third speaker talked about 'Health, transport and air pollution: At a glance'. The speaker Adrian spoke about transport and health in conjunction, highlighting the role of physical activity as a defence against disease as well as the importance of air pollution as a health problem with new evidence still emerging. The talks from the guest speakers were followed by questions from the audience around the future role of hydrogen in sustainable transport, options for public transport e.g. buses and around the broader challenges and barriers to Bristol effectively addressing the problem of air pollution.

Regarding Bristol City Council (BCC), people anticipate seeing better and proactive planning controls (from central area to outskirts) and for BCC to lead the way on renewables in the city, both in its policies and its corporate practice. Overall, participants hope that politicians will set policies and allocate funding, recognising long-term environmental benefits over short-term demands.

The participants' ideas for communities and citizens in 2050 include retaining financial profits locally. All utilities/service providers are locally owned too (either publicly or through local community ownership) and the port at Avonmouth is a centre for renewable energy excellence, trade and education. There are also vibrant local centres, people can walk/cycle to those they want to get to (as the exception rather than the rule) and the pavements are at a decent standard. Citizens' income will have improved equally. Young people from Knowle West Media Centre (KWMC) will act as city leaders, pioneering creative methods of making positive social/environmental change and more citizens will be empowered to work towards positive transformation and shared philosophies.

#### Transport:

Participants were also asked to envisage the transport industry in 2050. As expected, most answers were focused on sustainable means of transport, like:

- 
- electric vehicles fleet and centrally located buses,
  - excellent on-site bike facilities to meet all needs,
  - provision of a variety of cycling options,
  - ban of Euro 3/4 engines,
  - roads and public spaces designed to be welcoming and convenient for those on foot and
  - successful enforcement of the no idling rule.
- 

Moreover, no one would complain about public transport and transit to the city centre could be rapid and sustainable. The need to commute daily, especially to work, would be hopefully reduced. Flexible working hours and virtual meetings could take place instead. Improved access to green spaces was another suggestion that came up during the workshop.

### Energy use:

There were also some ideas about the housing sector and how buildings would be constructed in thirty years from now, but there were considerably less, compared to the previous categories. According to some people who took part in the workshop, future buildings will be ultra-low energy consuming and carbon neutral (new buildings = BREEAM excellent, renovated buildings = BREEAM good). Residents will feel empowered to control their own energy use and will have a say over how their homes, business and transport are powered and organised. Neighbourhoods will be sustainable nodes, providing all daily needs. Bristol will be at a position to produce enough renewable energy to power itself.

### Technology

Future technological improvements will probably enable companies and the business sector in general, to work towards greater changes through:

- 
- selection of sustainable office locations which allow growth,
  - virtual offices,
  - catering of business parks, promoting wider jobs and
  - employment across the whole of south Bristol.
- 

There was a comment about sustainability consultancies in 2050, hoping that they will be more holistic, whilst moving around a lot less at the same time. 'Consultancies will be "more community minded, rather than work focused'.

### Economy

Finally, the attendees expressed their concerns about the economic situation of the deprived areas of Bristol, hoping that it will improve. Similarly, tackling fuel poverty, was another ambition that was mentioned. Focus should be on alternative heat and power generation resources, as some people suggested. Somebody also envisaged the completion of a basic circular road for south Bristol and explained how this could reduce congestion. Circular road could enable people to live out a complete life in their locality, rather than being dragged into the over developed city centre. If all these ideas come true, air quality will improve.

Analysis of the data of Bristol MLW produced *six categories of proposed actions*, which were classified under the next headings: *governance, citizen engagement, transport, housing, environmental impact and communication*. The explanation of the categories are below.

### Governance

Some participants stated the important role that education could play, starting from school, where students could be informed about air quality issues and gain a better understanding of the matter. A topic that attracted many people's interest was *Bristol City Council's* operations and processes. The focus was on the need for change, in terms of its strategies and policies (e.g. procurement policy). Likewise, the necessity to raise funds and increase investment, especially in infrastructure was mentioned a lot, with quite a few attendees suggesting that economic opportunities should be spread across different areas of the city. Finally, transparency in the decision-making process, along with more citizen involvement was another interesting goal that was emphasised as an action that should be taken at a council level.

### Citizen engagement

Increasing citizen engagement, either through workshops or participation in behaviour change projects was an action proposed several times. The majority of the participants agreed that local communities should have a say on environmental issues that affect their lives and co-create solutions with policy makers with the aim of making those measures more meaningful to them. Furthermore, it was suggested that their objections to policies should be taken into consideration and decisions withdrawn in these cases.

### Transport

Transport was the largest category for proposed future actions. The focus of discussions was on the promotion of electric vehicles and the expansion of charging points, along with new opportunities (for example, hybrid electric vehicles and hydrogen fuel) and alternatives in general, to car use. There were some voices saying that old, polluting vehicles should be totally prohibited. Also of great interest to participants was public transport in Bristol. Most participants believe that there is plenty of room for improvement in this area. Sustainable, electric public transport, with lower fares and better links for South Bristol were amongst the leading ideas. Lastly, improvement of the walking/cycling environment in Bristol, in terms of safety and convenience was suggested.

### Housing and Business/Market

The next two categories, Housing and Business/Market raised the least ideas among all. Only three measures were proposed for housing: straw bale buildings, retrofit of existing housing stock for energy efficiency and integration of spatial planning and transport in all four local authorities of West of England Combined Authority (WECA). With regards to Business/Market oriented actions, apart from suggestions of more flexibility in working hours and shared working spaces, actions were abstract, advising "organisations to do more" and to be "100% carbon zero".

### Environmental impact and communication:

Finally, there were generic ideas about greener, better surroundings with reduced environmental impact and universal wind and solar power. Some participants also suggested marketing and social media campaigns to raise public awareness.

## 7.2 Priority actions

After careful examination of all the proposed measures those suggested by the majority of the participants and repeated more than twice are considered to be priority actions/policies:

- 
- changing the Council's policy decision-making process
  - greater investment in sustainable public transport and promotion of electric vehicles,
  - community engagement and effective communication with local people
  - provision of flexibility in working environments (working hours or working from home)
  - continued support of organisations in moving towards a zero carbon Bristol.
- 

### Policy instruments

To achieve the suggested actions, there are a series of policies that could be implemented and relevant policy instruments. At the local level, diesel vehicles and generator bans, along with targets for renewable energy, climate change and increased cycling and public transport infrastructure and use were suggested policies. The implementation of Clean Air Zones (CAZs) was raised on numerous occasions. For housing, it was suggested that any new houses or buildings should be constructed in accordance with more stringent energy efficiency standards or even to Passive house standards.

Regarding national policies, the predominant suggestions offered by the participants were about devolution of power to the city level, voting rights for 16-17-year olds, proportional representation and political change. Moreover, people expressed some ambitious ideas about transport, for instance electrification of all railways by 2050 nationally and in general, putting health and equality at the heart of all policies.

For meeting policy targets or standards, attendees of the workshop recommended that government should provide subsidies.

They also suggested a series of "soft" activities such as:

- campaigns against diesel generation,
  - no idling campaign,
  - marketing and social media campaigns (by 2026) and
  - awareness raising campaigns (through media and creative projects, by 2043),
- 

It is hoped that they could encourage people to adhere to new policies and regulations.

## 7.3 Milestones

Finally, participants were asked to identify some targets that needed to be reached by a particular date (milestones). Again, most answers were focused on achievements to be implemented by the local government:

- 
- Environmental statement for a 5-year programme, looking to update for their future vision,
  - Delivery of a CAZ by 2020,
  - Regarding planning policy: a local plan by 2020, the joint spatial plan 1 by 2022, the joint transport strategy 2 by 2033, the joint spatial plan 2 by 2036
  - A comprehensive bus strategy by 2020, a West of England Transport Plan, at the end of 2018
  - Freight consolidation centres by 2025
  - Increased agile or home working by 2030
- 

For national government, proportional representation, renationalisation of all utilities, decentralisation of powers, regulation of banks, increased government funding was suggested as important milestones but no dates were set.

## 7.4 Barriers and challenges

### Governance

Participants also recognised issues that present a barrier or challenge to taking action or implementing policies. They were able to identify a variety of problems that might occur for each sector. From a realistic point of view, the participants admitted that local government does encounter financial difficulties promoting sustainable solutions such as electric vehicles or offering subsidies (e.g. for renewable energy) and their financial planning horizon is usually short term. In general, there are internal governance barriers such as loss of trust in the system, and lack of ideology and courage. The main obstacle though is how to win *people's trust* again.

Feedback from the workshop raised some social issues too, like social equity, austerity and education cuts. One of the main question raised was how to motivate the public, gain cultural acceptance and avoid the rejection of imposed solutions. Another interesting aspect mentioned was the “school run” and school allocation and population disruptors such as increased population in cities and gentrification from London.

### Transport

Problems related to transport were also defined. Infrequency and unreliability of bus services leads to a lack of a quality alternative to car use, for instance and this is probably why many people depend on their car. Single journals are another negative dimension as well. In summary, the most radical change that participants agree is needed, is the transformation of people's travel behaviour.

### Housing

In terms of housing, problematic communication between tenants and landlords making the installation of solar panels and energy efficiency measures complex was raised as an issue. As a method to resolve this problem, someone suggested that the incentives could be split between landlords and tenants, so that housing renovations become more affordable.

### Business/Market

Challenges were noted around the lack of leadership and investment and the health impact of air pollution on citizens' life. It is also believed by some participants that aviation and highways are among the most polluting industries.

#### Preventive measures:

Some comments identified a decrease in research and innovation funds due to Brexit and a lack of joined up thinking as barriers. The capacity of the National Grid and its openness to small-scale distributed energy generation was another issue raised. Moving on to some health-related challenges, participants mentioned the invisibility of air pollution and the intangibility of its outcomes, whereas a stakeholder from the health sector highlighted that the focus should be on prevention and not on treatment.

## 7.5 Conclusion

Overall the Bristol mutual learning workshop successfully engaged with a variety of stakeholders from different sectors and organisations.

There were a number of 'political' stakeholders' (councillors at Bristol City Council from the Green and Labour Parties, and local campaign groups) which perhaps explains the focus on political barriers and governance at the workshop.

However, though political short-termism was identified as a barrier by stakeholders, the groups' pathways from 2020 to 2050 were largely short-term (apart from one group) when it came to setting actions and milestones beyond the next five years.

This highlights the difficulties scientists, policy makers, industry and civil/civic society organisations all have in visualising potential transformative actions that go beyond the systems already in place. Future workshops could seek to address this by spending more time on pathway development and less on barriers.

The increased uptake of electric vehicles and a potential "clean air zone" in Bristol are both actions/policies that have been widely discussed in national and local media recently and unsurprisingly they featured across pathways as potential policy actions.

In Bristol, clean air and air pollution are largely linked to the transport sector – both in people's minds and reality. The need for better transport and infrastructure planning in Bristol is clearly identified and links to improved housing and better connectedness across the city. Spatial plans need to be adequately supported by effective social planning that considers health impacts and requires political leadership and action.

The wide representation of civil and civil society organisations led to the identification of social and cultural barriers to change, but also opportunities and potential policy actions to increase bottom-up community and citizen engagement in local governance and decision making – something the ClairCity project aims to do.



## 8 MLW in Amsterdam

### 8.1 Vision

The Amsterdam MLW attendees were asked to imagine how Amsterdam would look in 2050, including any changes they expect to see or promote.

Most of the participants agreed that '*Very green, clean, pleasant city with very good network of public transport and only electric private transport*' they wish to see.

Addressing the issues by the speakers in Amsterdam at the MLW:

#### Air quality and health

There were three expert presentations from the Municipality of Amsterdam. The aim of these presentations was not to enter in discussion but to provide background and context for the interactive activity working in groups that followed. Speaker 1 focused on Air Quality and Health: Health effects of air pollution at all ages (throughout a lifetime). The speaker highlighted the next:

- 
- Environmental pollution (where the majority can be accrued to air pollution) is after smoking the most important factor affecting disease or death.
  - In the future by 2050 there will be more electric cars (zero emission cars) and more space for public transport, bikes, pedestrians (than for cars). Cars as we know them today will be extinct.
  - An important remark was made on the public misunderstanding of air pollution vs CO2 emissions.
- 

#### Transport:

Speaker 2 talked about Amsterdam and transport vision 2050. The presentation explained the trends in transport and expected number of commuters. Some pictures were shown of Amsterdam in 1984. Cars were dominant in the streets, there were no trees nor bikes. While in 1984 people were leaving the city (to go somewhere else), since some decades and currently Amsterdam is growing and growing. Transport dependent on spatial developments, economic developments, social demographic developments. Transport will evolve to be cleaner, faster, more comfortable and safe. Since cars in movement take up most of the public space more efficient use of space is the ultimate challenge for crowded cities such as Amsterdam: from car ownership to car-sharing. In the next 10 years, the expected trends are:

- 
- Urbanisation continues, also of the periphery
  - Partial shift to electric or hydro (pace of this in the Netherlands will depend on EU legislation)
  - Further automatization (effects in the city unknown)
  - More influence of big data in our daily lives
  - The power of big companies larger than that of the States
-

The Municipal government is planning to intervene by: setting environmental zones (also for private cars), giving priority to pedestrians and bikes, and shifting parking from streets to parking sites. The conclusion is that the future is difficult to predict. "Transport is becoming cleaner but the pace at which it will do so is unknown". Policy measures are needed for booking progress.

#### Energy use:

Speaker 3 talked about Amsterdam and energy vision 2050 'Sustainability'. In terms of energy, the focus of the Municipality of Amsterdam is CO2 emission reduction. For electricity the transition is towards locally-produced energy. They would like to have more windmills but the Province of North-Holland thinks differently. As for as heating, in Amsterdam 90% of homes and business are heated through gas. This is undesirable from a CO2 point of view. Moreover, the long-term vision for Amsterdam is to be gas-free by 2050. The main alternative is district heating.

After the plenary discussion the participants defined the main conclusions on the vision:

- 
- Participants share the vision that improvements are needed regarding more public transport, more room for biking and stimulation of electrical private transport;
  - Some believe that the city can become completely car-free within the city-ring;
  - Many believe that individual transport will remain important, even with improved public transport;
  - The city council rather favours central systems (district heating), whereas others believed in the possibilities of all-individual zero-energy houses;
  - The city council rather favours concrete measures over awareness raising;
  - Participants do not believe that current government action will be sufficient to achieve targets;
  - Overall the vision for the city is that of a very green, clean, pleasant city with very good network of public transport and only electric private transport.
- 

## 8.2 Priority actions

Analysis of the data of Amsterdam MLW produced the *categories* of proposed actions were classified under the next headings: transport, housing, energy use, governance and awareness raising.

This was the most interactive, hands-on part of the workshop. Participants were divided in three tables to work on two sessions: Work session 1: where are we going towards, and how fast are we going, what are the actions? Work session 2: what are the barriers and solutions that we currently see and expect we encounter? Below there is a summary of the discussions.

#### Housing and energy use:

Some participants stated that until now more and more people move into the city, which might negatively impact air quality. On the other hand, migration happens in wave-like patters. New forms of high-speed mobility might enable people to live further away from the city, but work in the city. If the increase in population and visitors in Amsterdam is sustained, this will push the cars out of the city because of competition for space. On the short term the first

neighbourhoods will be uncoupled from the gas grid, for newly built neighbourhoods this will become common practice.

On the mid-term cooperative models for renovating the existing built environment will become common practice, and as a result the demand for gas will decline faster than the supply available from domestic gas production. By 2030 the situation will be a bit chaotic as the energy system and the economy in general are not yet in equilibrium, but still changing at a rapid pace. This change will be welcomed by some people, while it might generate anxiety for others. In 2050, the largest part of the energy transition have taken place, and passenger transport and the energy consumption in households will be 100% electric.

Other group of the participants focused on actions and scenarios mainly focused on energy, rather than air quality. By 2050 all energy for the city would be produced in a sustainable way (i.e. wind, solar, biomass, geothermal, etc).

There was a discussion whether houses would be self-sufficient, or whether collective energy-system would be the way to go. A few participants believed in the concept of houses being self-sufficient but the person from the energy department of Amsterdam argued that there is not enough space in the city (e.g. roofs for solar panels) to produce the demand for energy. There will be need for a collective system, such as district heating, but that there also should be room for individuals to be self-sustaining.

One participant argued that agriculture is a big problem. It adds a lot to the background concentrations. Cities should educate people and try to stimulate people to consume less meat. In general education and raising awareness was recognised as an important topic.

The person from the energy department of the city of Amsterdam wondered whether money should be spent on education/raising awareness or on actual measures. He is inclined to spending more money on measures rather than on behaviour.

Actions by 2030 legislation should require that all new and renovated houses have solar panels. By 2050 all houses in the Netherlands should have solar panels.

#### Transport:

One group of the participants focused primarily on transport. Car transport in the city was discouraged up to 2025 by a segmentation of the city, in combination with more shared cars and improved public transport from the periphery into the city. The bikers interest group representative envisioned fast and slow bike transport lanes, with fast routes East-West, North – South. The existing ‘blue number plate’ allowing certain low-speed scooters to go on bike paths should be abolished. This should go in combination with a ‘healthy urban route planner’ – an app for bikes to be able to select the cleanest routes (such apps exist in Oslo, the US).

For the transport of goods innovative developments – such as shared transport opportunities for food would be needed. In the longer term, the city should be car free, apart from vehicles delivering goods. Obligatory PV on all roofs.

#### Overall:

Another group of the participants had an overall discussion on that what they would like to achieve by 2050:

Short wrap up of 2050 goals:

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- Amsterdam home heating fossil fuel free
  - Homes energy neutral or energy positive
  - Road traffic CO<sub>2</sub> neutral, emission free
  - No car (ownership) within city
  - Citizens should be more aware of the sources of the energy they use.
  - Air pollution is considered to pose no problem by 2050, since most road traffic will be emission free by then.
- 

- As for as the intermediate goals by 2020 and 2030: By 2030, the Amsterdam LEZ (Low Emission Zone) for cars will be made more stringent as to which cars will be admitted in an area. This will cause the air quality to be healthy (preferably by WHO standards) by 2030.
  - By 2020 all newly built homes will have no connection to natural gas, and by 2030 all new homes and office buildings will be energy positive.
- 

“Mood in the room” exercise: The opinions were divided for the following statements:

*“The citizens won’t accept fast changes in terms of sustainability measures (to improve air quality and CO<sub>2</sub> emissions)”;*

*“By 2030 there will be no more cars in the city centre of Amsterdam”;* and

*“Sustainable electricity will solve our transport and heating problems”*, although for this latter the majority through it WILL.

### 8.3 Milestones

The participants were asked to identify some targets that needed to be reached by a particular date (milestones). Most of the answers were focused on achievements to be implemented.

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By 2020:

Transport

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- Cars need to get out of the city
  - More mobility options come into place
  - Getting rid of light scooters
  - Developing ‘healthy route’ information for citizens to decide the way they choose to walk, bike
- 

Housing

- 
- First districts get rid off gas (small scale)
  - New built buildings are gas-free
  - Built environment more sustainable: lots of deep renovation and new built buildings sustainable (mandatory solar panels)
- 

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## Governance

- 
- Awareness raising of neighbours, measuring with neighbours
- 

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## By 2030:

### Transport

- 
- Only non-polluting, emission-free cars in the city
  - Electric, shared car systems in Amsterdam only
  - Safety for bikes (max. tot 25 km/hour electric mopeds in the bike path)
- 

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### Housing

- 
- Collective renovations of housing will take place
  - From 2020 until 2030 no more high temperature district heating (low temperature district heating)
  - Gas becomes far less popular
  - All new built buildings are energy positive
- 

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### Preventive measure

- 
- More greenery, more public gardens and parks
- 

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## By 2050:

### Transport

- 
- Transport is 100% electric
  - Between 2030 and 2050 the city fully car-free (some goods transport can still circulate)
  - A comprehensive public transport network (running every 3 minutes)
  - Shared good transportations
  - Emission-free transport
  - More public transport, more bikes
- 

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### Housing and energy use

- 
- All energy consumption in a neighbourhood will be powered by electricity
-

- Mandatory solar panels for every roof
- Local production of energy by individuals

## 8.4 Barriers and challenges

The participants recognised issues that present a barrier or challenge to taking action or implementing policies. The summary of the identified barriers and challenges are below:

One group of participants said that there will be several barriers to be overcome, including:

- The issue that society is no longer used to large publicly funded infrastructure projects, as the electricity grid, gas grid and sewage system have been in place for a long time already. However, the strong electrification needed for the transition to renewable energy sources, will also require large public investments in electricity infrastructure, especially at the local (neighbourhood) level.
- There is a lack of expertise among professionals to provide, produce and install new types of technologies and buildings that are needed to transform society sustainably.
- In the construction sector the financial crisis stimulated sustainable initiatives as this enabled project developers to stand out from the crowd in a difficult market. However currently, the demand for new construction projects is so large that companies no longer have to do their best to provide sustainable solutions in order to undermine competition.
- There is often a mismatch between the people who make the investments in 'clean' technologies and those who benefit from it.
- Because of lobbying by established regime actors (large companies) there is still no level playing field between fossil energy technologies and sustainable alternatives.

Solutions to overcome the barriers include:

- 'We need to make our education system more future-proof, we need visionary education'. On the side of professional education, it is important that the state of the art sustainable technologies and concepts are taught and not the old polluting ones. Also, a more visionary type of education provides an opportunity for the development of innovative and creative ideas which results in business opportunities.
- 'We need to create a level playing field by taxing polluting modes of transport and energy applications and stimulating sustainable solutions'.
- On the mid-term some strict regulations might be needed to discourage polluting/unsustainable behaviour.
- Because of the reduction in demand for gasoline it will become hard to find a gas station.

Other group of the participants identified barriers on governance:

- Differences in governance (local, provincial and national) were identified as barriers. For instance, cities might be more progressive than regional or national government. And citizens might be more progressive than the city. For instance, Amsterdam would like to have windmills in the harbour, but the province (who must give the permit does not agree). A small-scale project in Amsterdam (the Ceuvel) wanted to be self-

sustaining but found the city of Amsterdam in their way. They just started doing it and the city became interested and let them continue.

- It was discussed that there should be (more) room for bottom up initiatives. Room to experiment and learn on the way. Small scale projects can become mainstream if successful.

#### Transport, energy use, awareness raising

- Some of the barriers named were the mindset citizens, the use of space by different means of transport in a limited space, safety issues related to electrical bikes in bicycle lanes which can ride faster than regular bikes, investment possibilities for citizens, the costs of new heating infrastructure, resistance of car and scooter companies and stakeholders.
- Solutions are found in making 'Environmental zones' increasingly stringent. New 'environmental zones' have to come into place for all types of transport eventually (towards an emission free transport by 2050).
- Solutions are awareness raising (the example of the joint development -between energy providers, a bank and the Municipality- of a so-called 'Energy Hub' to speed up the energy transition in the South-East of Amsterdam was mentioned); benchmarking and naming/shaming – neighbourhoods, car stakeholders. Co-creation processes with citizens; Offering lower costs – subsidies for energy efficiency and insulation measures; Showing the benefits of more space in the city – green in the city.

#### Taxing CO2 emission and space use:

- In general people tend to prefer the use of highly individualised types of transportation (ie. cars over public transport). People who own a car and want to park their car within the city pay for it already, but the price they pay is not high enough. The discussion focused for a large deal on how to make people pay for the space they use and the CO2 they emit. Some people at the table believed that creating more awareness and taking away legal barriers for new experiments (i.e. on car sharing or 'mobility as a service') would have a bottom up effect. Others suggested that CO<sub>2</sub> emissions as well as the use of space should be taxed.

## 8.5 Conclusions

The conclusion of the MLW summarised below:

- Participants share the vision that improvements are needed regarding more public transport, more room for biking and stimulation of electrical private transport;
- Some believe that the city can become completely car-free within the city-ring;
- Many believe that individual transport will remain important, even with improved public transport;
- The city council rather prefers central systems (district heating), whereas others believed in the possibilities of all-individual zero-energy houses;
- The city council prefers concrete measures over awareness raising;

- Participants do not believe that current government action will be sufficient to achieve targets;
- Overall the desired vision for the city is that of a very green, clean, pleasant city with very good network of public transport and only electric private transport.

Participants concluded that the main barriers are:

- Large infrastructure (district heating) versus individual choice (individual zero energy housing): no solution provided.
- Expertise from professionals in the built environment needed: skills of the construction sector.
- No level playing field between sustainable and fossil technologies: taxing, financial incentives.
- Mismatch between those who invest and those who profit: no solution provided.
- Mismatch between interests on different governance levels (city want turbines, province doesn't allow): no solution provided.

## 9 MLW in Ljubljana

### 9.1 Vision

The Ljubljana MLW attendees were asked to imagine how Ljubljana would look in 2050, including any changes they expect to see.

The majority of the participants agreed that 'Very modern, innovative green, clean, pleasant city with very good network of public transport and cycling facilities.

Mutual Learning Stakeholder Workshop (MLW) was held with different stakeholders to share and discuss the health risk factors in the city environment now and within the timescale of the future scenarios (2020-2030-2050). At the MLW there were four speakers, who are great experts at the field of health in urban environment. The attendees were having background from geography, architecture, health, medicine, economy, land scape and urbanists, security, physics and chemistry.

Addressing the issues and priority actions by the speakers in Ljubljana at the MLW:

Two presentations were held as introduction and presentation of the overall context of air quality, climate change/management and health impacts on national and city level. They focus on the current health risk factors and the quality of the city environment.

#### Impacts of air pollution on public health

The first presentation focused on the impacts of air pollution on public health. The findings of WHO and other national organizations presented that air pollution is one of the major factors for health problems within population. Almost 90 % of city population in general are exposed to values above the limits of PM10, PM2,5, NOX, O3 and benzene in air. In addition, transport in cities is one of the major causes of air pollution, which statistically impact the health of newborns and is also cause of premature births.



The second speaker talked about the results of the MED-HISS project, EU LIFE project covering several Mediterranean states, including Slovenia. The aim was to assess impact of long term exposure to pollutants of outdoor air on health, to support with evidences the changes of EU legislation and to develop new epidemiological surveillance measures with the data collected from the environmental monitoring of air pollution, modelling and national health data. It was clear that the most vulnerable groups of citizens are patients with chronic diseases, children, elderly population and physically active people. This presentation gave useful information and data to the ClairCity project research.

In the course of the project the common approach for the assessment of increased risk for health problems due to the air pollution was developed and is now available for future estimations. The most important aspects of the methodological approach used were spatial resolution of pollutant release estimates (4.4 km in horizontal resolution of the internal (nesting) calculation area with 185 × 167 calculating cells) and pooling of data at municipal level: geostatistical approach to kriging with external influence.

The third presenter talked about a national project VEN ZA ZDRAVJE (Out for health) which focus on health aspects and planning of green areas for healthier environment and public space in connection with physical activities of population. Ljubljana has already well organized spaces with green surfaces supporting a healthy lifestyle.

The fourth presentation was on sustainable mobility with different concepts available in theory but also from the view of future possible developments. Sustainable mobility includes several possible transports: walking, cycling, public transport, special available services (Kavalir), use of Ljubljanica river.

#### Input by stakeholders:

Ljubljana city started to close the center for motor traffic already several years ago, now the city would like to increase the pedestrian cones also to other connected areas. Therefore, the workshop is organized to perform the guided tour and then to work within 2 groups to prepare the possible vision for this particular part until 2020, 2030 and 2050. In this respect the main related strategic documents adopted in Ljubljana municipality were briefly presented and discussed. The following are relevant to the vision on Ljubljana to 2050:

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- Until 2020: Environment protection program, Sustainable urban strategy and local energy concept;
  - Until 2030: Ideal city – sustainable city – the Slovene capital, comprehensive traffic strategy
  - Until 2050: Zero waste – the cultural changes
- 

The participants found that the plans above are the basic strategic documents for the future of the city.

The participants first attended the guided tour in the area of interest for the further work: it started at the City hall to the first bridge over Ljubljanica river, than continue on that side of the river to Krakovski nasip and turn back on the other side of Ljubljana river to City hall.

All participants discussed the current arrangements and possibilities for the improvements and enlargements of the pedestrian zone. This area is partly already free of traffic with exception of electric cars provided services for municipality (Kavalir). They combine the pedestrian zone with areas for bicycles, not very organized, a lot of spaces for restaurants and pubs and just refurbished banks of Ljubljana. On one side there are still street with cars. The Ljubljana river is navigable and a kind of river transport is already organised. After return to the meeting place, the participants were divided in 2 groups and asked to develop the strategy for area of interest until 2020, 2030 and 2050 with possible measures. The group were divided in a way to have participants with different background education,

## 9.2 Priority actions and Milestones

Analysis of the data of Ljubljana MLW produced *categories* of proposed actions, which were classified under the next headings: transport, housing, energy use, green infrastructure and awareness raising.

The participants were asked to identify some targets that needed to be reached by a particular date (milestones). Most of the answers were focused on achievements to be implemented.

The results of the two groups are presents in the table 1, where the year indicated the plans for certain time in the future, strategies 1 and measures 1 are product of group 1, strategies 2 and measures 2 are product of group 2.

The participants defined the Priority actions and measures:

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By 2020

- 
- Promotion of adopted strategies – policy measure: closing of the roads for individual transport for several days,
  - Vegetation of riparian area - measure: continuous and round cycling routes
  - Improvement of quality of living - measure: more green elements in the traffic streets, more stations for bicycle, promotion of sustainable mobility
- 

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By 2030

Ljubljana city for all generation - measure: increase of green spaces and green infrastructure with multifunctional role

Sustainable mobility - measure: relieve of Zois street for traffic

Burn calories not gas - measure: spread of inner pedestrian ring, car sharing

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By 2050

Strategy for implementation of adopted strategies - measure: the center of city is free of cars, the delivery is arranged

Modern, innovative city - measures: Complete electrification of public transport, hyper mobility, bicycle is the engine for development, work from home, reduction of needs

The results of the two groups formed from the MLW participants are presents in the table 1, where the year indicated the plans for certain time in the future, strategies 1 and measures 1 are product of group 1, strategies 2 and measures 2 are product of group 2.

Table 1: The result performed by groups

Year	Strategies 1	Measures 1	Strategies 2	Measures 2
2020	Promotion of adopted strategies	closing of the roads for individual <u>transport</u> for several days,	Vegetation of riparian area  <u>Improvement of quality of living</u>	Continuous and round <u>cycling routes</u>  More green elements in the traffic streets  More stations for bicycle  Promotion of sustainable mobility
2030	Ljubljana city for all generation	Increase of green spaces and <u>green infrastructure</u> with multifunctional role	<u>Sustainable mobility</u>  Burn calories not gas	More car free local centers (zones) all over the city  Spread of inner pedestrian ring  <u>Spread bike and car sharing</u>
2050	Sustainable urban strategy (part 2-goals for 2050)  <u>The center of city is free of cars, the</u>	Optimization of last mile delivery  Redesign and optimization of public transport	Sustainable urban strategy (part 2-goals for 2050)  - carbonless city,	<u>Work from home, reduction of needs</u>

	delivery of goods and services is arranged  <u>Public transport is main traffic mode</u>	hyper mobility, bicycle is the engine for development	- modern and innovative city  Hyper mobility, bicycle is the engine for development  <u>Work from home, reduction of needs</u>	Complete electrification of public transport
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### 9.3 Barriers and challenges

The participants recognised issues that present a barrier or challenge to taking action or implementing policies. The summary of the identified barriers and challenges are below:

The ideas were discussed by both groups.

- The final vision of the area of interest was the next,
- to increase the traffic free zone to the wider area,
- to establish the sharing space which is in use on very busy area of Ljubljana,
- to increase the number of Bicycle (the bicycle) stations,
- to introduce the transport on the Ljubljanica river regular stations,
- to replace all public transport with electric buses and cars,
- to increase the number of vehicles for older and other in need (Kavalir type of individual transportation linking the public transportation).
- in addition, city would need to work on restoration of green areas, including new water elements (fountains and drinking water areas).
- another systematic solution for cleaner air is complete public heating system which is currently not available.

### 9.4 Conclusions

- The Mutual Learning Stakeholder Workshop (MLW) in Ljubljana took place on the premises of Ljubljana municipality City Hall. The workshop was attended by participants from different institutions and non-governmental sectors with the aim to discuss the possibilities for improvement of air quality in the city and to decrease the health impacts for future.
- The MLW was divided in two parts, first covering the theoretical findings relevant for the city and presenting some of the recent national and international projects. The second part was based on the real field tour and the question how to improve sustainable mobility in the area. The participants were innovative and discussed the possible improvement of situation, also by increasing measures which are already now available (like, pedestrian zones, share spaces, electric cars Kavalir for vulnerable individuals, Bicycle service).

- But they also introduce new ideas like improvements of heat supply system to avoid the use of wood, use of green elements for isolation for buildings, use of river Ljubljana for transportation and introduction of new green and water elements to be enjoyed by citizens.
- The MLW provides a good tool for discussion the possible vision, strategies and measures for improvement of air quality in the city. Therefore, it is advised to be used also on regular basis by the city authority.

# 10MLW in Sosnowiec

## 10.1 Vision

The Sosnowiec MLW attendees were asked to imagine how Sosnowiec would look in 2050, including any changes they expect to see or promote.

The majority of the participants agreed that *'Very green, clean, pleasant city with very good public transport and bicycle routes they wish to see.'*

Addressing the issues by the speakers:

Sosnowiec MLW is a good example can be a good model for the European cities/regions on how to engage stakeholders on the air quality, climate change and public health today and in the future (2020, 2030, 2050). The speakers at the MLW represented public health, transport, energy use, air quality and climate change areas.

### Air quality and public health

The speaker 1 presented the major issue of Sosnowiec: 'Air quality in Sosnowiec and the region'. Sosnowiec is one of the most polluted places in Poland and Europe. The agglomeration of Silesia, to which Sosnowiec belongs, has the worst air (several hundred percent of the exceedance of particulate matter PM 2.5 and PM 10 and benzo (a) pyrene) mainly in the cold months (late autumn - winter - spring). Pollution is caused mainly by the residents themselves by burning bad quality fuel in outdated furnaces, thus heating their homes and apartments. In the summer months the air condition is relatively good (well below the permissible concentrations), which proves that emissions from transport and industrial activities do not have a dominant influence on the state of air in the city.

The next speaker presented the 'Air quality's impact on the health of residents of Sosnowiec'. The presentation concerned the health effects caused by living in a city where air quality is low throughout the year and as a result of the so-called smog incidents. Inhabitants of Sosnowiec, inhaling the air, have health effects similar to burning out several thousand cigarettes a year. Diseases affect residents of all ages and vary in severity, depending on individual health characteristics.

### Transport

The third speaker presented 'Transport in Sosnowiec: past, present and future. The city's intensive development took place in the 1970s. At that time, a road network was planned, which to a large extent functions to this day. At that time, individual road transport was the most important. Creating a network of roads convenient for drivers, giving them priority for pedestrians and cyclists was the main goal of the authorities. The road network was planned in such a way that the city is rarely dodged today, and driving is easier and faster than in neighboring cities. However, the space for pedestrians and cyclists is very limited. Currently, there is a change in the perception of urban space and more and more attention is paid to facilitating pedestrians, public transport and cyclists. That's why the city decided to create the

first bus pas running through the city center (the main street in the city), city bike rental, new bicycle paths, transfer centers, and the plans for the near future are changing the character of the city center for pedestrian-friendly. The centre's reconstruction plan is in the final phase.

### Housing and energy use

The next speaker presented the 'Energy in Sosnowiec: past, present and future' Sosnowiec conducts a number of activities aimed at improving air quality. The city is currently focused on the modernization of heating, building insulation, expansion and modernization of heating systems and installation of renewable sources. The regional anti-smog resolution implemented in 2017 prohibits the use of poor quality fuels and obliges residents to replace old furnaces. Sosnowiec offers its residents a high co-financing for exchanging the heating method for environmentally friendly ones. The city also implements measures aimed at energy savings: it exchanges energy-intensive street lighting for LED with an intelligent control system and introduces a thermal and electrical energy management system in schools.

### Climate change

Sosnowiec as one of the 44 Polish cities participates in a project financed from European and national funds, which will result in the development of an urban plan for adaptation to climate change. The aim of the project is to examine the vulnerability, vulnerability and resilience of the city to possible climate changes and to prepare city authorities and their residents to respond to them responsibly.

### Input by the participants:

In the plenary discussion it was noted that building scenarios up to 2020, 2030 and 2050, the group had the greatest difficulty with the vision of 2050. It was decided that by 2020 little will change. There will be the first signs of upcoming changes, but it will be a very preliminary phase. The most important changes will take place by 2030. The year 2050 is very difficult to describe, because technologies change so quickly that it is difficult to predict at the time what solutions will be considered ecological and economic at that time.

## **10.2 Priority actions**

Analysis of the data of Sosnowiec MLW produced *categories* of proposed actions, which were classified under the next headings: transport, housing, energy use, governance and awareness raising, green infrastructure and ageing society,

The future actions and the possible policy measures have been widely discussed by the participants.

One group discussed the vision of Sosnowiec's development in three perspectives: by 2020, 2030 and 2050. At the beginning of the discussion, it was noted that it was impossible to build a strategy for Sosnowiec in isolation from the region. One of the discussion participants was a member of the board of the Silesian-Zagłębie Metropolis - an institution responsible for creating a common policy of cities, including in the field of transport.

- 
- The group decided that the 2020 perspective will be the time of implementing already initiated measures and possibly new solutions.
  - "Revolutionary" changes can take place in the next decade.
  - The most difficulties were caused by the year 2050 as the most distant, difficult to predict, perspective.
- 

Other group of the participants the visions of development prospects until 2030 and 2050 after the initial brainstorm were also coherently outlined. Interestingly, the group unanimously noted that

by 2050

- a world-view revolution is needed that would discourage the consumption of society and the sense of a greater bond and responsibility of the individual.
  - observations of a demographically ageing society the seniors are a very important target group of all projects and educational activities.
- 

### 10.3 Milestones

The participants were asked to identify some targets that needed to be reached by a particular date (milestones). Most of the answers were focused on achievements to be implemented.

By 2020:

Transport

- public transport will be more ecological (almost all buses will be electric or hybrid); tram service will improve;
  - development of electric bus networks;
  - free public transport for some social groups;
  - transport will also be modernized; new tracks will be created;
  - first charging stations for electric cars will be created;
  - adapting the product to customer expectations;
  - transfer centers will be created;
  - construction of bicycle paths and bike rental network;
  - improving access to information for the residents;
  - car free zones will be introduced.
- 

Housing

- there will be no significant changes in the method of heating homes, there will still be many residents using poor quality fuels and burning fuels in old furnaces;
- the first inhabitants will start using renewable energy sources;
- subsidies to change the way of heating to eco-friendlier will be sustained;
- connecting to the municipal heating network of buildings;



- actions for the growth of renewable energy through the creation of new funding mechanisms;
  - replacement of boilers for new type boilers (5th class), building a mechanism for financing new boilers;
  - banning of poor quality fuels.
- 

#### Air quality and public health

- the air quality will still be bad, in the winter months permissible pollutant concentration limits will be well above the limits;
  - health effects caused by air pollution will be felt.
- 

#### Governance, education

- Educational campaigns that raise the environmental awareness of residents.
  - public health education (using antismog masks)
  - seniors' education
- 

By 2030:

#### Transport

- public transport will not use solid fuels;
  - cheaper, better public transport (more connections);
  - a total ban on the use of diesel vehicles will be introduced (this will be forced by the European Union);
  - the city center will be more citizen-friendly, cars will be banned from entering center;
  - car traffic in the city will be significantly reduced, favoring pedestrians and cyclists.
- 

#### Housing

- old stoves will be removed from homes;
  - passive buildings will be more popular
  - a command and relief tool needed to pressure the connection of new buildings to the heating network
  - replacement of heat sources throughout the city for low-emission.
  - community (group of residents) heating networks will be created.
  - waste will be treated not as garbage, but as resources that can be used for energy purposes.
  - development of photovoltaics, wind energy and heat pumps
  - urban lighting will be completely replaced with LED;
- 

#### Green infrastructure

- more green areas will be created, green buildings will appear (with greenery on the roofs and walls);

- appropriate provisions in urban spatial development plans for buildings (connection to the network and thermo-modernization) and green areas
- 

#### Population change

- in the city, due to population decline, many residential buildings will be abandoned It will be necessary to demolish them or change their functionality;
  - the society will be old, there will be a need to provide new services for seniors.
- 

#### Air pollution and public health

- the health effects caused by air pollution will continue to be felt.
- 

By 2050:

#### Transport

- car traffic will be significantly reduced due to the lack of frequent movement of residents (they will work in homes - teleworking).
  - only electric and hydrogen cars will move along the streets.
  - new energy and transport technologies will be implemented.
- 

#### Housing

- individual household power plants will be built.
  - energy will be obtained mainly from renewable sources (sun, wind) and from waste (thus the problem of landfilling will be completely eliminated).
  - total abandonment of fossil fuel energy
  - all houses subjected to thermo-modernization, new built houses only passive
- 

#### Green infrastructure

- the city will be definitely greener;
  - urban lighting will be even more ecological than LED (currently unknown technology);
- 

#### Population change

- ageing society
- 

#### Air pollution and public health

- the health effects caused by air pollution will continue, only little progress
- 

## **10.4 Barriers and challenges**

The participants recognised issues that present a barrier or challenge to taking action or implementing policies. The summary of the identified barriers and challenges are below:

The participants said that there will be several barriers to be overcome, including:

- barriers that complicate the implementation of the scenarios can be divided into three groups: legal, financial and related to the awareness of residents.
  - currently, the law in Poland is not stable, it is often changing, it does not give any guarantee for the future. For this reason, people are afraid to invest in modern solutions. They are not sure that the technology, which is currently promoted and for which financial concessions are granted, will not be charged with additional fees in the near future (*legal obstacles*).
  - society is too poor to bear the costs of energy transformation. Earnings of Polish residents are lower than the income of Western European citizens. Co-financing of, for example, replacement of a furnace with a modern one is not sufficient, as the cost of fuel for a new boiler is often impossible to be borne by residents (*financial obstacles*).
  - society is not fully aware of the consequences of their own actions. There is no knowledge about the health consequences of burning low quality fuels or rubbish (*an obstacle related to the consciousness of residents*).
  - local government employees do not take part in trainings offered by, for example, universities increasing their knowledge about renewable energy sources;
  - activity of energy companies: residents exchange lighting and home appliances for more economical, and electricity bills do not decrease. Energy companies inflate bills to keep profit.
  - ownership of the land and spatial and climatic conditions will make it difficult to design a garden city and introduce more greenery.
  - ageing society, social resistance and architectural barriers will not allow complete elimination of car traffic in the city center.
  - low public awareness of health threats, downplaying the impact of smog on health
  - no charging station for electric cars
- 

#### Solutions:

- introduction of a stable, good law;
- market regulation by the national government (reduction of energy prices);
- maintaining the current subsidy for replacement of boilers and introducing co-financing
- to operating costs (purchase of fuels);
- permanent educational activity;
- encouraging people to green their surroundings (garden instead of parking);
- adaptation of services to the needs of an ageing society;
- proper spatial planning (controlled sale of plots for development, creation of so-called green islands);
- purchase of air purifiers for public buildings (e.g. for nurseries, kindergartens);
- increasing the involvement of residents in activity
- Priority given by national, regional and local authorities to pro-ecological activities;
- conducting public consultations, actions raising the health awareness of residents and a clear indication of the benefits of pro-ecological solutions;
- ban on the sale of coal;
- better planning of space in the city;

- pre-school, school and seniors education (awareness must increase at every stage);
- using municipal events to promote ecological solutions;
- public health as a priority at the government level;
- lifestyle change for less consumption.

## 10.5 Conclusions

Three theses were put forward before the participants for conclusion:

1. "In 2030, there will be no individual cars in the center of Sosnowiec".
2. "Introduction of a total ban on using coal as fuel in households would have a significant impact on air quality and our health".
3. "Entry into force of the "anti-smog resolution" (Resolution No. V / 36/1/2017 of the Śląskie Regional Assembly of April 7, 2017 on the introduction of restrictions on the operation of installations in which the fuel is burned) which will result in a significant reduction of "low emissions" in the cities of our region".

The workshop participants who agreed with the thesis were asked to take a seat on the right side of the room, while its opponents stood on the left side.

In the case of thesis No. 1, the majority of participants strongly agreed with it. The representative of the opponents group, when asked why he considers the thesis impossible, explained that in his opinion, the use of personal cars for official purposes would be exercised on special rights by people holding public functions working in public buildings located in the city center.

All participants of the workshop agreed with the thesis No. 2.

In the case of thesis No. 3, only 3 people claimed that it was true. The comment of a representative of this small group, however, indicated the need to introduce in Poland legal provisions regulating the issues raised in the "anti-smog resolution" at the national level. The vast majority of participants were opposed. The representative of this group, asked to explain this position, stated that without increasing the awareness of all residents, despite the legal regulations, the use of highly harmful fuels and even rubbish will still take place.

Over the three theses, all participants expressed that the MLW is a very interesting and useful method for innovative thinking and planning the future of the city,

# 11 MLW in Aveiro Region

## 11.1 Vision

Participants from different municipalities local and regional organizations from private sector (transport, industry), local NGO's on environment and health governmental entities as the regional directorates of environment and health were invited by the city partner CIRA. The agenda of the Aveiro Region Mutual Learning Workshop was based on the MLW guidelines and adapted to the Portuguese habits and time schedules.

The Aveiro Region MLW attendees were asked to imagine how Aveiro Region would look in 2050, including any changes they expect to see or promote.

### Vision:

*Most of the participants agreed that they wish to see a healthier region with a cleaner air and smaller carbon footprint, in the present and the near future.*

### Addressing the issues by the speakers

#### Air pollution

The aim of the plenary was to give an overview of the air pollution problems in the Aveiro Region and to present past and ongoing research on methods to improve air quality, human comfort and wellbeing and protect human health. The speaker 1 gave a brief introduction to the subject and presented some case studies where modelling tools were applied to test measures (influence of trees, route options) to improve air quality, reduce human exposure and increase human comfort.

#### Transport

The speaker 2 introduced a research group of Transportation Technology and its main fields of research, the concept of Intelligent Transport Systems (ITS) and Advanced Transport Mobility Systems (ATMS). The speaker presented the aims and expected outcomes of three ongoing projects. The @CRUiSE: Advanced Impact Integration Platform for Cooperative Road Use, includes a mobile app, a GIS model with noise, emissions and costs data, and an On-Board Platform of Sensors for Enhancing Safety of Cyclists; the project MobiWise: from mobile sensing to mobility advising aiming to design a 5G platform with an infrastructure of sensors, people and vehicles and data storage in a cloud; and the project CISMob dealing with the mobility challenges in the Aveiro Region promoting innovative actions to reduce the carbon footprint and aiming to increasing sustainability by a better efficient use of urban transport infrastructures.

After the talks, there was time for a general discussion on the topics addressed and the visions for the year 2020 in the Aveiro Region. Within their group, each participant was invited to present the material brought about actions that contribute to the environment and health in the region. Since just one or two participants brought a leaflet, the facilitator encourages participants to share in the group the contribution of their organization to make the Region of Aveiro healthier, with a cleaner air and smaller carbon footprint, in the present/ near future.

The second part of this working group was the reflection on the visions for 2050. Each participant had to think on their visions and strategies for the future, set goals to achieve by 2050, present and discuss them within the group, and wrote them down in post-it to stick in Poster 2050.

## 11.2 Priority actions

After careful examination of all the proposed measures those suggested by the majority of the participants there are considered to be priority actions/policies: transport, housing, governance, education and awareness raising, environment and health protection.

### Visions and actions by 2020 and 2050

For 2020 the main visions and ideas discussed for the Aveiro Region were related to:

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- the need of awareness for teachers (to engage children and parents), politicians, citizens,
  - the use of IT platforms,
  - improve the ambient air quality network and monitoring of indoor air quality,
  - the promotion of strategies for environment and health protection, namely promote the use of bicycles / bike paths, less cars, electric public transportations, create green corridors / urban forests, to guarantee emission reduction and energy and resources efficiency.
- 

Regarding the horizon of 2050, participants were more ambitious. Their ideas cover the following aspects:

- citizenship / commitment / behavior / values
  - increase inspection
  - city maps of air quality
  - more efficient house heating system / fireplace certification
  - better public transport network combined with parking outside city center, car sharing, ban car traffic in cities, create free public transport network, throughout the region, zero emission zones towards resilient cities.
- 

## 11.3 Milestones

The participants were asked to identify some targets that needed to be reached by a date (milestones). Most of the answers were focused on achievements to be implemented.

The milestones are presented in the Annex at the end of Aveiro chapter.

## 11.4 Barriers and challenges

The participants recognised issues that present a barrier or challenge to acting or implementing policies. The summary of the identified barriers and challenges are below:

The participants said that there will be several barriers to be overcome, including:

Challenges and barriers – actions and priorities

Once again, participants had the opportunity to share their proposals with the others. The main challenges and barriers identified were:

- need to change mentality/lack of individual awareness, ignorance
- promote participation and valuing the opinion of citizens
- fight against car and energy lobbies, capitalism
- willingness to change and improve / resistance to change, egocentrism, fear
- lack of good environmental leadership/ inadaptability of policies / functioning of local policy systems
- lack of incentives for cleaner behavior and public participation / tax incentives.

## 11.5 Conclusions

The main conclusions of the Aveiro region MLW are the next:

- lack of good environmental leadership
- inadaptability of policies - functioning of local policy systems
- lack of incentives for cleaner behavior and public participation - tax incentives

The proposed policies and incentives below can provide sustainable solutions towards 2050 in the region. The cooperation of the government and stakeholders are important for the envisaged future of the Aveiro Region.

Annex: The details of visioning Aveiro region on 2020-2030-2050 are provided below.

Activity	Group 1	Group 2
Visions 2020	<ul style="list-style-type: none"> <li>• Promotion, from kindergarten to high school, of <u>educational programs</u> and projects, actions, events, on sustainable development (mobility, energy efficiency, eco-schools, environmental management of schools, awareness of food waste, forests, noise, ...)</li> <li>• alerts on social media and online platforms about the <u>environment based on complaints or events</u></li> <li>• PLeaflet about the project "Santo Cabeço" (project created after a major fire occurrence, aims to restore and protect the remaining native vegetation in a small town of Agueda - Belazaima do Chão)</li> </ul>	<ul style="list-style-type: none"> <li>• There is a company in Gafanha da Nazaré that promotes the use of bicycles giving an extra day of annual leave for those who bike to work</li> <li>• By 2020, it is planned to create 30 km of <u>cycle paths in Ílhavo</u></li> <li>• 300 students from Gafanha da Nazaré use the bike daily. Project: "The future of cities is the bicycle" aims to replace the car by the bike</li> <li>• <u>Entrepreneurship competition</u> (increase the number of projects related to the quality of the bicycles)</li> <li>• C MARKET (from 2012, 2013): awareness-raising for the reduction of carbon footprint,</li> </ul>

	<ul style="list-style-type: none"> <li>• regional development projects under the national environmental education strategy and national strategy for air</li> <li>• CCDR-C has an ongoing project called “better air in the center” which aims to <u>improve the air quality network for more and better information on the air quality in the region</u></li> </ul>	<ul style="list-style-type: none"> <li>• more efficient processes and energy efficiency certification</li> <li>• Proposal presented to the City Hall to provide bicycles, allowing mobility between services</li> <li>• Leaflet of project UAU BIKE.PT. Provision of bikes to the academic community (teachers, students and staff) to increase the use of bicycles instead of the car</li> </ul>
<p>Visions 2050</p>	<ul style="list-style-type: none"> <li>• absence of car parking in the center of urban areas</li> <li>• <u>free network of electric buses or other public transports, throughout the region</u></li> <li>• tree planting in the cities and adjacent areas; creation of ecological corridors</li> <li>• no tolls on the A25/A17 sections</li> <li>• <u>network bike lanes across the region</u></li> <li>• creation of incentives for transport sharing (car, bike, boat sharing)</li> <li>• people commit to promote the sustainability of the planet and to contribute for the quality of life</li> <li>• <u>inform people enabling them to opt for sustainable mobility, efficient use of houses and efficient use of resources, value the preservation of the environment</u></li> <li>• more enforcement to ensure compliance with environmental legislation</li> <li>• incentives for the use of cleaner technologies</li> <li>• <u>environmental awareness</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>prohibit the circulation of private cars in cities, car parks in the peripheral areas</u></li> <li>• parking for bicycles/ safe infrastructures</li> <li>• rental of hybrid and electric cars</li> <li>• micro-cars / bicycles, "cool" bicycles</li> <li>• <u>transport sharing</u></li> <li>• best electric public transport network (density, frequency and schedules)</li> <li>• certification of fireplaces</li> <li>• <u>more efficient housing</u></li> <li>• more <u>infrastructures prepared for cyclists</u> in public services and companies</li> </ul>
<p>2030 – Challenges and Barriers</p>	<ul style="list-style-type: none"> <li>• Capitalism - <u>financial economy based on debt</u></li> <li>• fear and egocentrism, ignorance, lack of leadership and lack of will</li> <li>• <u>lack of participative processes</u> at community level, lack of policy makers with environmental conscience</li> <li>• <u>lack of incentives</u> for more sustainable behaviors (use of bikes, walking and car sharing)</li> <li>• willingness to improve;</li> <li>• need of greater involvement and <u>better supervision</u>;</li> <li>• more and better information for full awareness of reality;</li> <li>• <u>good environmental leadership</u></li> </ul>	<ul style="list-style-type: none"> <li>• mentality</li> <li>• <u>land use/urban planning</u></li> <li>• participation and opinion of citizens</li> <li>• <u>education and awareness</u></li> <li>• <u>resistance to change</u></li> <li>• information and communication</li> <li>• fight against car and energy lobby</li> </ul>



<p>2030 – Actions and Priorities</p>	<ul style="list-style-type: none"> <li>• alternative means of exchange, instead of using money</li> <li>• <u>environmental awareness - the need to link health to the environment</u></li> <li>• invite the community to implement strategies, to take action and to monitor</li> <li>• press policy-makers for change</li> <li>• for <u>more environmental monitoring</u>: government guidelines with guaranteed involvement of more human and financial resources</li> <li>• education/ valorization of the essential role of each one in the promotion of behaviors that promote the sustainability of the planet and the <u>quality of life</u> (priority 1)</li> <li>• <u>Promote awareness</u> on sustainable mobility, energy efficiency, resource use and other that lead to environmental friendly decisions (priority 2)</li> <li>• <u>education for citizenship</u> and exercise civic participation (involving students, families, communities) (priority 3)</li> <li>• <u>promote opportunities</u> for active participation in the education for sustainability. Each person contributes to his own sustainable development (priority 4)</li> </ul>	<ul style="list-style-type: none"> <li>• marketing</li> <li>• <u>strategic vision for planning</u></li> <li>• certification of cities ("child-friendly city")</li> <li>• invest on information and awareness programs</li> <li>• more open school curricula</li> <li>• <u>goals: establish the results to be achieved, with measurable goals</u></li> </ul>
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Activity	Group 3	Group 4
<p>Visions 2020</p>	<ul style="list-style-type: none"> <li>• pedagogy to the community, better conditions/ public policy pressure</li> <li>• <u>reduce car use /increase bicycle use</u></li> <li>• Measures to reduce particulate emissions in port activity, evaluation of air quality in Gafanha da Nazaré;</li> <li>• <u>Air quality information to the population</u></li> <li>• <u>energy efficiency measures</u></li> <li>• support to University of Aveiro studies on air quality or health.</li> </ul>	<ul style="list-style-type: none"> <li>• implement a plan towards low carbon emissions, considering water, energy and waste</li> <li>• <u>implement measures of energy efficiency (namely in transport sector), and efficient use of resources</u></li> <li>• <u>monitor and assess indoor air quality (particularly in health services), including the definition of control measures to prevent exposure</u></li> <li>• <u>raise awareness</u> of workers and users of health services, politicians and citizens in general for environment and health related problems</li> <li>• <u>monitor atmospheric emissions</u> of point sources (related with health services emissions) and verify legal compliance</li> </ul>

		<ul style="list-style-type: none"> <li>• promote research, through financial grants, related with health and exposure to environmental key factors</li> <li>• renew the bus fleet using cleaner technology and introduce new electric bus in Aveiro region public transportation network</li> <li>• <u>Supervise the industrial activity</u></li> </ul>
Visions 2050	<ul style="list-style-type: none"> <li>• <u>non-polluting cars</u>;</li> <li>• <u>more and better legislation</u>;</li> <li>• cities that are more sustainable, more resilient and closer to the citizen;</li> <li>• <u>educated, more informed and more responsible citizen</u>;</li> <li>• <u>efficient public transport network</u>;</li> <li>• car-sharing;</li> <li>• increased use of pedestrian and cycling modes;</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Reduction of private cars in cities</u></li> <li>• Proactive identification of pollution problems – diseases, indicators</li> <li>• Contact with nature (e.g. to understand and follow the food lifecycle)</li> <li>• <u>Knowledge and education</u> (need to know the planet to protect it), training and information</li> <li>• <u>Integrated mobility policies</u>, complementary modes (e.g. private car – bus – bike), efficient public transportation network</li> <li>• Return the city to citizens</li> <li>• Effective assessment of the cause-effect between diseases/ morbidity/ mortality and exposure to air pollution</li> <li>• Implement protective strategies – reduction of exposure (e.g. domestic, workplace, urban environments)</li> <li>• <u>Municipal air quality maps as a decision-support system to include in urban planning</u></li> <li>• Urban road traffic management depending on AQ monitoring in real time, considering innovative tools of AQ monitoring and modelling.</li> </ul>
2030 – Challenges and Barriers	<ul style="list-style-type: none"> <li>• lack of individual consciousness;</li> <li>• <u>change mentality</u>;</li> <li>• economic interests of the car industry;</li> <li>• educate citizen and politicians;</li> <li>• <u>function of political power</u>;</li> <li>• change the way you act;</li> </ul>	<ul style="list-style-type: none"> <li>• hard to change implemented habits and recognize the need to change, inertia</li> <li>• easier to think individually</li> <li>• mismatch between citizens and the overall politicians</li> <li>• <u>lack of financial support</u> of individual citizens in their sustainable choices (e.g. non-pollutant equipment or with low-emissions, change from private car to bike use)</li> <li>• lack of connection between citizens and nature, lack of knowledge about environmental issues</li> </ul>

2030 –  
Actions and  
Priorities

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• include in the programmatic content of the citizenship discipline concerns about air quality, health and carbon footprint (priority 1);</li> <li>• <u>train politicians</u>: create a proximity committee between university/ municipalities / citizens (priority 2);</li> <li>• prohibit the circulation of cars (mainly diesel), creating support structures (priority 3);</li> <li>• <u>promote more efficient heating equipment</u> (priority 4)</li> </ul> | <ul style="list-style-type: none"> <li>• promote knowledge transfer between distinct sectors, disseminate knowledge and information</li> <li>• <u>promote changes in citizens behavior</u></li> <li>• define priorities that will promote shared mobility (e.g. public bus)</li> <li>• <u>include air quality as a goal of the national policy program, including financial funds available to support that.</u></li> <li>• integrate effective measures within governance strategies at community and national levels</li> <li>• <u>create urban planning management strategies</u> oriented through citizens (e.g. smartphones app's for sharing of mobility solutions, efficient use of urban resources, strategies to improve and preserve well-being and lifestyle)</li> <li>• increase citizens' contact with environmental practices</li> <li>• link again citizens and nature in order to raise awareness on nature protection and preservation</li> <li>• raise awareness about climate change effects within CIRA, reduce greenhouse gas emissions, remediate – planning for more extreme weather events</li> <li>• <u>perform environmental monitoring and assessment, including the implementation of more air quality stations</u></li> <li>• <u>improve sustainable mobility, urban planning strategies, home-school-work-leisure accessibilities, promote non-pollutant public transportation.</u></li> </ul> |
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## 12 MLW in Liguria Region

### 12.1 Vision

The Liguria Region MLW attendees were asked to imagine how the Liguria Region would look in 2050, including any changes they expect to see or promote. Most of the participants agreed that 'a *green, clean, low carbon region*' they wish to see.

Addressing the issues by the speakers:

The participants of the MLW represented various departments of the Region (health, energy, transport), of the City of Genoa (health, transport) and of its territorial structures (municipalities), the Regional Energy Agency, private companies, Port authority, Regional Environmental Agency, NGOs, Health and Environmental Agencies.

#### Air quality

The speaker 1 described the air quality situation in Region. In Liguria, despite significant improvements in air quality, problems persist about pollutants NO<sub>2</sub> and O<sub>3</sub>, particularly in the agglomeration of Genoa, of interest for the ClairCity project. In the specific case of Genoa, the pollutant that raises the most concern is nitrogen dioxide, for exceeding the annual average limit in city monitoring stations located in areas of heavy road traffic, and ozone. The values of PM<sub>10</sub> generally respect the limits, although exceedances can occur as happened in 2015 climatic conditions. In Genoa, air quality is therefore a problem for the health of citizens.

The causes of this situation can be identified by analysing the emission sources and the distribution of concentrations. The main sources of PM<sub>10</sub> and NO<sub>x</sub> emissions in the city of Genoa are the port and the road traffic. The main contribution to the local level of NO<sub>2</sub> and PM<sub>10</sub> concentrations recorded by the monitoring stations of the regional air quality network located in the urban areas of Genoa is determined by road traffic.

The Region under the national law has the task of adopting the plans and measures necessary to reduce the concentrations within the limits or objectives established by the national and European standard. As a consequence of the exceeding of the limits for nitrogen dioxide, an infringement procedure is underway with the European Commission.

#### Climate change

Climate change, as an environmental aspect of a global nature, is important for Liguria and Genoa for the local effects it produces (increased risk of phenomena of hydrogeological instability, drought and fire, heat waves) with consequent effects on people, their health and on the economy. Therefore, the integration between the objectives of air quality improvement and the objectives of reducing greenhouse gas emissions is strongly necessary.

The Deputy Director Environment of the Liguria Region is planning the drafting of the Action Plan, which will include:

- An overview of the measures already taken by local and regional administrations,
  - Urgent additional measures to reduce the concentration of pollutants in the ambient air,
  - Provision for monitoring the effects of the action plan,
  - Communication and information to the public.
- 

The short-term measures that will be assessed with the involvement of the Administrations involved, concern:

- Measures to regulate urban road traffic such as: *limit circulation* to the most polluting vehicles, traffic management in particular critical situations such as large construction sites work interfering with city traffic, agreement with Port Authority for the management of traffic linked to port accesses, regulation of accesses to motorways, regulation of distribution of goods in urban areas;
- Measures on the use of Biomass such as selective incentives, better knowledge.

The long-term measures will be foreseeing in the urban mobility plans, as an important tool that can contribute to the reduction of the use of private vehicles, and on the electric mobility while with regard to emissions from maritime activities that are generally of a "over regional" nature, the Region intends to set up a discussion table with the Port Authorities.

Last but not least is the information, to start creating awareness on the topic, and for this reason the ClairCity project will make a great contribution.

It was explained how ClairCity has the ambition to create an important change in the behaviour of the citizens toward the causes of the scarce air quality, inviting the citizens to express their opinions about the air pollution and carbon footprint reduction in order to modelling the city of the future.

It was presented the innovative instruments to quantify the pollution and increase the awareness of the citizens through their involvement in the definition of a set of future scenarios for emissions reductions, minimize the impact on the health and supporting the development of policy measures with a vision to 2050.

Regarding the MLW in Genoa, different stakeholders involved in environmental and health issues have been invited to participate. To the participants is asked to share the vision on the risk factors of their city at actual and future scenarios (2020-2030-2050).

## 12.2 Priority actions

After careful examination of all the proposed measures those suggested by the majority of the participants considered to be priority actions/policies: transport, energy use and climate change, air quality and public health, and regional governance.

The planning framework was introduced with the European and national context, the Regional Environmental Energy Plan 2014-2020, and the local context with the Covenant of Mayors for Climate and Energy. Following the innovative financial instruments for energy efficiency (EPC, ELENA, Horizon 2020, etc.) and the activities of management of supply and maintenance contracts for hospitals have been mentioned.

The new Regional Environmental Energy Plan (PEAR 2014-2020), approved on 2017, constitutes the strategic instrument for the regional energy planning of the civil sector (residential + tertiary + public) alone is responsible for about 50% of regional final consumption and sets targets and actions on energy efficiency and renewable sources in Liguria, incorporating the contents of national «Burden Sharing» legislation which assigns to each region the targets for 2020. The speaker focused on energy information system of Liguria Region. For many years the Liguria Region has been the only Region in Italy to elaborate and maintain a Regional Energy Balance, using original regional data, thanks to the regional information system, in synergy with the emission inventory. This information is elaborated at regional level also using direct census on main energy producers and consumers as well as transport infrastructures.

### Energy use and climate change

In the frame of Covenant of Mayors municipalities commit to reduce their emissions by 20% by 2020 developing a Sustainable Energy Action Plan (SEAP). Andora in Liguria region has been the first municipality that has joined. In 2015 the Covenant of Mayor for Climate and Energy was launched, thus incorporating the issues related to adaptation to climate change. The document that the municipalities must draft is now called Action Plan for Sustainable Energy and Climate (SECAP). IRE (the company of the region that deals with infrastructures, building renovation and energy) supports the preparation of SEAP/ SECAP in Liguria realizing many SEAP (including the Municipality of Savona and the Municipality of Genoa) and is involved in some new SECAP including those of Sanremo, Genoa and Savona.

Finally, IRE forwards work in agreement with the Region on the Elena program (EC program supports local actors on large scale energy efficiency investments projects and covers 90% of costs) and on horizon2020 programming.

### Transport

There was presentation by the next speaker on the average times of travels which are always higher and therefore it is necessary to implement a more integrated approach for cities planning, the city planning must be integrated with transport planning.

Undoubtedly in the cities, also in Genoa, environmental benefits can come from the reduction of transport costs connected to the use of individual transports and therefore it is important to act on the individual behaviours. In the meantime, environmental and social benefits can derive from the in-vehicles technology, reducing for example traffic congestion, travel times.

New investments are necessary for electric mobility. The charging stations are 4207 in all the national territory, about 20 in Genoa, while in Germany they are 22.000 and in UK 14.000.

Each territory has own peculiarities, so each tool has to adequate to the territory, taking into account that the good things at now, will be not valid in the future and that is fundamental the cultural aspect and the development of awareness by citizens. The theme of sustainable mobility needs to be done using a great courage and involves great change in the behaviours of the citizens.

### Public health

The speaker from the health sector explained the environmental factors affecting health are many, but until now there have been few predictive studies, as it is very difficult to indicate the direct relationship between pathology and environmental factor. Also, in Italy and in Liguria Region it's starting to work with synergy between who works on environment and who works in health, because until now environmental politics didn't preoccupy about prevention of the health.

In the National Plan of Prevention 2014/2018, macro-areas area with specific actions are introduced, like the macro-area 2.8, where are included actions to Reduce environmental exposures potentially harmful to health. One of the most important instrument is the VIS (Health Impact Assessment).

As foreseen by the State Regions Memorandum of Understanding of 2014, all the Regions and have drawn up their own Regional Prevention Plan (PRP).

The Programme II "Health and well-being" of the Liguria Regional Plan of Prevention 2014-2018 in the Macro objective "MO8: Reducing environmental exposures potentially harmful to health" includes the following actions:

- The establishment of a renewed Regional Health - Environment Observatory,
- regional guidelines for integrated health impact assessment (VIS) (DGR 1695/2016);
- Definition of regional criteria for the management of health problems attributable to environmental pollution;
- Transposition of national guidelines for risk communication or, in their absence, adoption of regional guidelines on the matter;
- Networking among all institutional subjects of environmental monitoring data and health data on mortality, incidence of neoplasia, hospitalization and reproductive outcomes, collected on the territory;
- Certification of the Animal Cancer Registry;
- Feasibility analysis on the extension of the Cancer Liguria Registry to the entire Regional population;
- Continuation of epidemiological studies initiated in particular areas at risk for environmental pollution
- Definition of training curriculum for health and environment operators involved in the VIS and in the management of health problems attributable to environmental pollution;
- Promotion actions to facilitate access to public funding dedicated to information and training activities on the management of health issues attributable to environmental pollution;
- I level training (trainers) and II level (local operators) on VIS and management of health problems attributable to environmental pollution;
- Participation in the Radon National Plan for the reduction of the risk of lung cancer and the elaboration of Regional Addresses for the adoption of municipal building regulations in an eco-compatible way.

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The next speaker said that they are preparing the urban plan of the sustainable mobility. In Genoa city a real planning wasn't implemented, many fragmented measures have been implemented without a global vision. The implementation of the urban plan that goes together with the transport plan is a very complex process.

### 12.3 Milestones

The participants were asked to identify some targets that needed to be reached by a particular date (milestones). Most of the answers were focused on achievements to be implemented.

The following strategic lines have been presented and started the audit of the stakeholders:

- The orientation toward the citizens should be non-sanctioning, but rewarding towards the citizens which have virtuous behaviour;
- The connection between West and East zones is one of the priorities of the Municipality; in the zone of Val Polcevera an extension of the metro toward West is planned;
- In Genoa the different types of transports, railway, boat, metro (much limited) must be valorised;
- Policies related to mobility, logistics and public transport, railway, road and underground planning, regulation and management of sustainable mobility, with scenarios for 2020 and 2030 and future vision for 2050 have to be carried out;
- Incentives for a sustainable mobility must be improved (electric bus, electric cars, car-pooling, bike sharing with electrically assisted pedal bicycles);
- In some years the electric vehicles charging stations should become 500 (now they are about 20);
- In this vision the protected buses lanes should be implemented. At present the protected yellow lane of Europa road is the unique existing protected lane in Genoa. It exists for 20 years and is particularly appreciated from the citizens because the service is faster and they have the certainty to arrive to a specific location at an appointed hour.

The next speaker, talked about energy scenarios processing to 2020-2030 and national air pollution scenarios the National Energy strategy, started in 2013 and becoming the official strategy. Regarding air pollution in Italy, the most critical situation is in Po Valley, particularly for PM<sub>2.5</sub>, that is very dangerous for the health. In Genoa the situation of PM<sub>2.5</sub> is good, but it is not so for ozone and nitrogen oxides. The representative of ENEA underlined that *the local policies must be connected to the national policy*. He also underlined the importance of national investments in infrastructures which reflect the local level (for example the electric vehicles).

The speakers and some other participants have discussed on the theme of air quality and carbon footprint in Genoa, its policy measures, evidencing as they have to be integrated with the aspects of energy, transport and health.

An outcome of this discussion is that the work of the technicians should involve the citizens and that the politicians should incorporate the instances by citizens themselves and consider the results of the work by technicians, including projects such as ClairCity.

### 12.4 Barriers and challenges

The participants recognised issues that present a barrier or challenge to acting or implementing policies. The summary of the identified barriers and challenges are below:

The participants said that there will be several barriers to be overcome, including:



Some of the participants underlined the necessity to connect the scientific and technical activities on these themes with the needs of the citizens. It was particularly appreciated the tentative to put together different stakeholders permitting to deal several aspects connected to air quality theme (energy, transport, health).

It was pointed out as the lack of awareness and of knowledge of citizens on environmental issues reflects on the individual behaviour.

Some innovative projects were discussed: The first project consists in electrifying fourteen moorings in the area of naval repairs. This project will allow us to switch off the generators on board the ships being repaired. The project has a cost of about 12 million-euro co financed by the Ministry of Environment and the Liguria region. The project carried out by the Western Ligurian Sea Port Authority. The second project is to electrify the port of Voltri - Pra in order to be able to feed container ships during the loading - unloading of containers. These ships are already prepared for connection to a ground electric system. We have already on the agenda some inspections on board these ships to define the technical aspects that the system on the ground must meet. The expected times for the realization of this project are about two years.

Finally, there is a further electrification project for the mooring of the cruise ships, launched recently. This project is carried out in synergy with the first project, as the same system is used to electrify the moorings in the "Repairs Naval" area, using a submarine conductor.

## 12.5 Conclusions

With the MLW in Genoa the workshops which have involved six cities/regions of this project have been completed. This type of workshop is useful because permits to learn each with the other. The representative of REC said that it has been very interesting because the stakeholders have debated the different aspects connected to air quality (energy, transport, health) and have discussed among them.

To think to the future, also far (2050) represents a difficult challenge and for this reason it is very important to work together and to change the behaviour of the people,

All the results of the MLWs in the different cities presented in specific Report.

## 13 General conclusions

Overall the mutual learning workshops successfully engaged with a variety of stakeholders from different sectors and organisations. As identified there was a lack of business representation at the workshops and this likely accounts for the 'gap' in in-depth discussions around business models, finance/investment, and barriers specific to business and growth.

However, though political short-termism was identified as a barrier by stakeholders, the groups' pathways from 2020 to 2050 were largely short-term (apart from one group) when it came to setting actions and milestones beyond the next five years.

This highlights the difficulties scientists, policy makers, industry and civil/civic society organisations all have in visualising potential transformative actions that go beyond the

systems already in place. Future workshops could seek to address this by spending more time on pathway development and less on barriers.

The increased uptake of electric vehicles and a potential “clean air zone” in the cities are both actions/policies that have been widely discussed in the media recently and they featured across pathways as potential policy actions.

In most of the cities clean air and air pollution are largely linked to the transport sector and housing. The need for better transport and infrastructure planning in the cities is clearly identified and links to improved housing and better connectedness across the city. Spatial plans need to be adequately supported by effective social planning that considers health impacts, and also requires political leadership and action.

The wide representation of civil and civil society organisations led to the identification of social and cultural barriers to change, but also opportunities and potential policy actions to increase bottom-up community and citizen engagement in local governance and decision making – something the ClairCity project aims to do.

The framework for analysis of the MLW contains the next structure were used in the analysis of the MLW in the four cities and two regions.

1.Vision; attendees were asked to imagine how their city/region would look in 2050, including any changes they expect to see.

2.Priority actions (policies): proposed measures by most of the participants which are priority actions/ policies.

3.Milestones: participants were asked to identify some targets that needed to be reached by a date

4.Barriers and challenges: Participants recognised issues that present a barrier or challenge to acting or implementing policies

5.Conclusions: the overall conclusion of the MLW including the vision and the policy actions.

As it was said above defining the pathways from 2020 to 2050 is not easy for the cities and the regions. We can conclude that the methodology of the MLW worked successfully. In most cases the priority actions/policies are the similar: transport, housing and energy use, climate change, air quality and public health, citizen engagement and governance (local, regional).

The move from visioning towards real actions, including new and integrated policy measures, can create condition for the future of the cities and regions, towards clean, healthy and low carbon city and region in 2050.