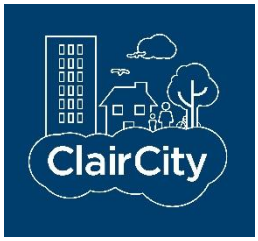


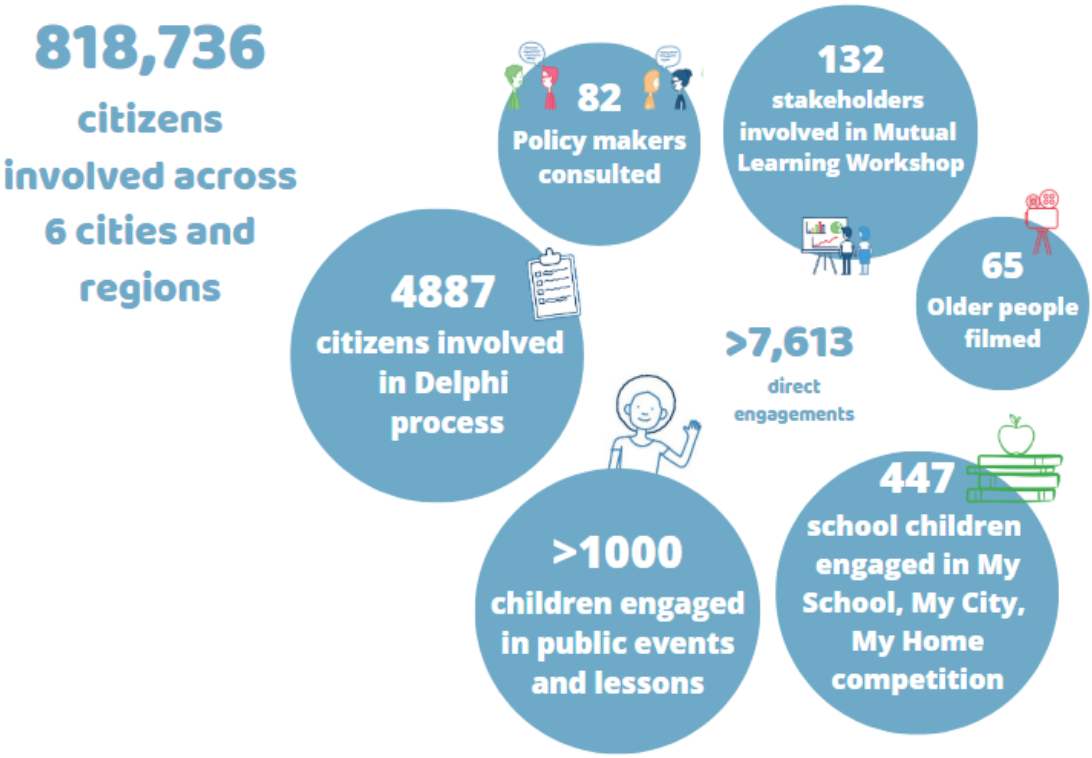
ClairCity - Citizen-Led Air pollution Reduction in Cities

D2.8 ClairCity Final Evaluation Report

Margarida Sardo
Laura Fogg-Rogers

ClairCity received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 68928.

1. Executive Summary



ClairCity was an EU research project which aimed to raise awareness about air pollution and carbon emissions in our cities, looking at how we all contribute to the problems and how they affect the air we breathe. Uniquely, the project put the power in the hands of residents to determine the best local solutions.

Six partner cities directly shaped the project; they were Amsterdam in the Netherlands; Bristol in the UK; Ljubljana in SIovenia; Sosnowiec in Poland; the Aveiro region in Portugal and the Liguria region in Italy.

The project researchers brought together detailed information about air quality in each city and how daily life there causes air pollution. Local residents got involved through social media, a game for phones, schools competitions, city events, and local workshops. Combined with citizen preferences and aspirations, we then generated sophisticated future scenarios that modelled the options available to each city. All this information helped to define tailored solutions for each city and region.

By framing the pollution sources, social practices, and city to national policies from the perspective of the citizen, the project aimed to make air pollution and carbon emissions and

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the associated health implications relatable to individual and societal actions, with a core goal of raising awareness of air quality.

A total of 8302 people from ClairCity cities/regions directly engaged with the project over its duration. In addition, there were 103,494 views of the project website, and over 770,000 social media impressions. Overall, the project more than met its engagement targets.

The evaluation of our engagement activities attracted 855 participants. More males (63%) than females participated in the evaluation due to the most popular engagement activity being the game (N=534 evaluators), with a high level of male players. The game also appealed to a younger audience than other activities, meaning that overall, 25% of evaluators were aged 16-25 years old. However, different activities appealed to different ages of people, and so all age categories are represented in the project. For instance, the workshop activities (Delphi, policy, and stakeholder workshops) attracted 66% of people in the age category of 45-54 year olds and 83% of 55-64 year olds.

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Overall, participants tended to enjoy the activities in which they took part; the younger the participants, the more likely they were to say that they enjoyed the activity. The activities also had an impact, with 74% of participants said that they would now make a change to their lives to improve air quality. The more participants enjoyed the activity, the more they reported that their understanding of air quality had improved. Similarly, the more participants reported that their understanding had improved, the more they reported that they would change their behaviour. Younger people and those with lower education to start with were more likely to say they would change their behaviour. All of these relationships were highly statistically significant.

To fully realise the goal of citizen-led air pollution reduction in cities, researchers and policymakers need to work hard to ensure engagement participation is reflective of city demographics. This evaluation shows the importance of designing engagement activities which appeal to a wide variety of audiences to ensure that a broad cross-section of society can participate in engagement with policymaking. The more enjoyable the engagement activities, the more people gain understanding about the issues, and the more likely people are to make a change to their behaviour to reduce air pollution and carbon emissions, and improve the health of our cities. We hope this evaluation report proves useful to other policymakers working towards a future with clean air.

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2. Contents

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3. Document Details

Authors	M. Sardo (UWE) and L. Fogg-Rogers (UWE)
Quality Assurance & Language Check	E. Hayes (UWE)
Creation Date	09/10/2019
Date of Last Revision	21/04/2020
Version	6.0
Description	This report details the purpose of evaluating the ClairCity public engagement process, the framework for analysis and the evaluation findings. As well as outlining the evaluation rationale, it presents a full account of all evaluation methodologies and data collected for each Work Package (WP) in the project. The evaluation was designed by Margarida Sardo (UWE) and managed by Laura Fogg-Rogers (UWE), and analysis was conducted alongside Corra Boushel (UWE), Sophie Laggan (UWE) and David Judge (UWE). The UWE point of contact is Margarida Sardo (margarida.sardo@uwe.ac.uk).

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3.1. Version History

Version	Updated By	Date	Changes / Comments
1.0	Margarida Sardo	09/10/2019	Report outline
2.0	Margarida Sardo	15/01/2020	Changes implemented after discussion with Laura Fogg-Rogers
3.0	Margarida Sardo	14/02/2020	Review
4.0	Margarida Sardo	03/03/2020	Review and integration of comments from project partners
5.0	Margarida Sardo	02/04/2020	Review
6.0	Margarida Sardo	21/04/2020	Updated following feedback from Laura Fogg-Rogers (UWE) and Enda Hayes (UWE)
7.0	Laura Fogg-Rogers	28/4/2020	Final integration of all comments from across WPs.

3.2. Project Involvement

Project Director	Hans Bolscher, Trinomics <hans.bolscher@trinomics.eu>
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Project Leads with Evaluation Components	WP2.1 Laura Fogg-Rogers, University of the West of England WP3 Enda Hayes, University of the West of England WP4.1 Jo Barnes, University of the West of England

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	WP4.2 Andy King, University of the West of England WP4.3 Svein Knudsen, NILU WP4.4 Eva Csobod, REC WP6.1 Stephan Slingerland, Trinomics WP6.2 Enda Hayes, University of the West of England As detailed in the evaluation framework D2.2, WP5 and WP7 were not evaluated through this process as they did not directly engage with any citizens.

3.3. Acknowledgements

The evaluation team is grateful for all the help and support that ClairCity consortium members and City partners provided in collecting evaluation data. The team is also grateful to all participants who gave feedback on the various ClairCity engagement tools.

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4. Project Summary

4.1. The problem

How do you want to live, work, and travel in your city of the future?

That's the question we asked citizens in six case studies and regions across Europe in this four-year long research project. ClairCity was an EU research project which aimed to raise awareness about air pollution and carbon emissions in our cities and understand how our day to day practices, activities and behaviours contribute to the problems. Uniquely, the project put the power in the hands of residents to determine the best local solutions.

Air pollution is the cause of one in eight premature deaths worldwide[1]. Poor air quality disproportionately harms children and the elderly, causing respiratory diseases, cancer and exacerbating heart conditions. People living in cities are particularly affected, with 90% of urban residents exposed to harmful levels of air pollutants according to the World Health Organisation.

The activities polluting our air are also the same ones producing carbon emissions – the major cause of climate change. Reducing carbon emissions in cities is critical to achieve major cuts in carbon globally, so reducing climate risks. The EU now has a target of reaching net zero carbon emissions by 2050, with action urgently needed to improve the health of citizens and the environment.

While the effects of poor air quality are felt worldwide, the sources are usually local. Every day, air pollution and carbon emissions are produced by our commutes to work, by heating our homes, or through our daily lifestyles. Understanding how we live – and the restrictions we face in those choices – is key to improving air quality, reducing carbon emissions and protecting public health. Solutions at a local level can make a big difference.

4.2. The project

ClairCity was a Horizon 2020 funded project responding to the call 'Improving the Air Quality and Reducing the Carbon Footprint of European Cities' (SC5-4-2015). The project ran across four cities and two regions in Europe, engaging the public on issues of air pollution, carbon emissions, public health and wellbeing and the future of their cities and regions.

The project took a novel approach to understanding air pollution, carbon emissions, and their impact on citizen health and wellbeing. Using a sociologically informed perspective, the project aimed to shift the policy focus from technology and technological solutions to taking a

[1] World Health Organisation, 2014

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closer look at the problems caused by people's daily practices, activities and behaviours. ClairCity used innovative modelling and quantitative analysis to examine the role of people and society in creating pollution. By better understanding these behaviours and processes, successful policy interventions can be developed to meet local needs and enable societal change so that greener choices become the social norm for everyone. Core to the project were a set of innovative tools that allowed city residents to participate in understanding the problem, visioning the future and taking ownership of the solutions to achieve results for their city. More information on ClairCity can be found at the website www.claircity.eu

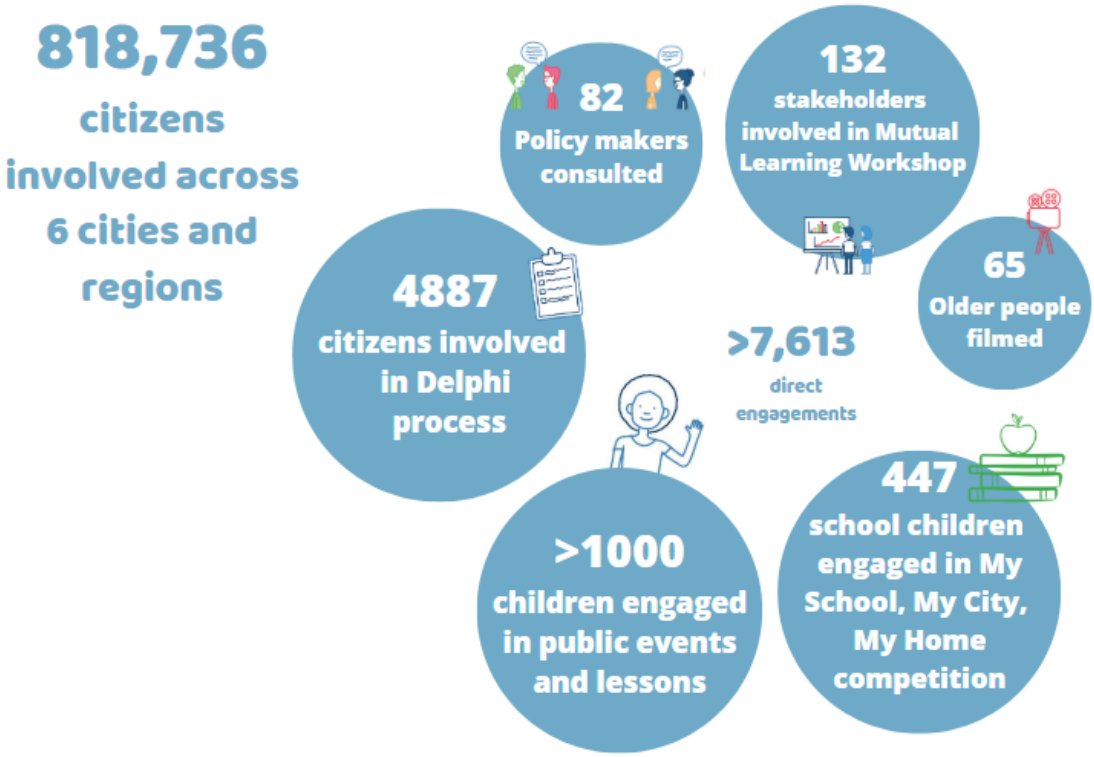

Figure 1: Engagements throughout the ClairCity project

4.3. The cities and regions

Six partner cities/regions directly shaped the project; they were Amsterdam in the Netherlands; Bristol in the UK; Ljubljana in SIovenia; Sosnowiec in Poland; the Aveiro region in Portugal and the Liguria region in Italy. Over 818,000 citizens got involved through social media, a game for phones, schools competitions, city events, and local workshops.

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The project brought together detailed information about air quality in each city and how daily life there causes air pollution. Combined with citizen preferences and aspirations, we then generated sophisticated future scenarios that were quantified for each city. All this information helped to define tailored, citizen-led solutions for each city and region. This unique approach raised awareness of air quality in our cities and ultimately allowed us to work with citizens towards a future with clean air.

Figure 2: Cities and regions involved in ClairCity

4.4. The ClairCity process

The following section outlines the ClairCity process and provides some description and context for the activities that have been evaluated. The ClairCity Project (www.claircity.eu) aims to substantially improve future air quality and carbon policies in European cities by initiating new modes of engaging citizens, stakeholders and policymakers. The latest social science thinking is applied to understand citizens' behaviour and source apportion air pollution emissions and concentrations, carbon emissions and health outcomes in order to attribute them not just by technology but by citizens' behaviour and daily activities. By putting people at the heart of both the problems and the solutions (primarily framed around transport and domestic energy use), ClairCity stimulates the public engagement necessary to tackle our challenging problems through the development of a range of citizen-led future scenario and policy packages.

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The four primary objectives of the ClairCity project are:

- To put citizens' behaviour and activities at the heart of air quality and carbon management and policy making;
- To develop a suite of innovative toolkits for enhanced quantification, engagement and impact evaluation;
- To explore the integration of citizens behaviour in relevant city policies and ensure that future city policies are reflective of citizens visions for their future city; and
- To raise awareness of environmental challenges and their solutions through proactive dissemination of the project outcomes.

The ClairCity process has three key process phases with a number of activities which work towards achieving the project aims and objectives. This process has been applied across all six ClairCity case study areas with some localisation and adaptation as required.

4.4.1. Phase 1: Establish the Baseline Evidence

The primary aim of Phase 1 is to understand and quantify the baseline status of air quality, carbon emissions and related public health in our cities. Phase 1 is achieved with the following main activities:

- **Benchmarking behaviour**: Understanding the local demographic data and establishing the citizen practice-activity data to feed into the air quality models (WP3).
- **Quantify the baseline**: Quantification of the baseline air quality emissions and concentrations, carbon emissions and public health impacts in our city (WP5).
- **Assessment of Policy**: Collation and analysis of current policies (local, regional, national and EU) that influence the city (WP6).

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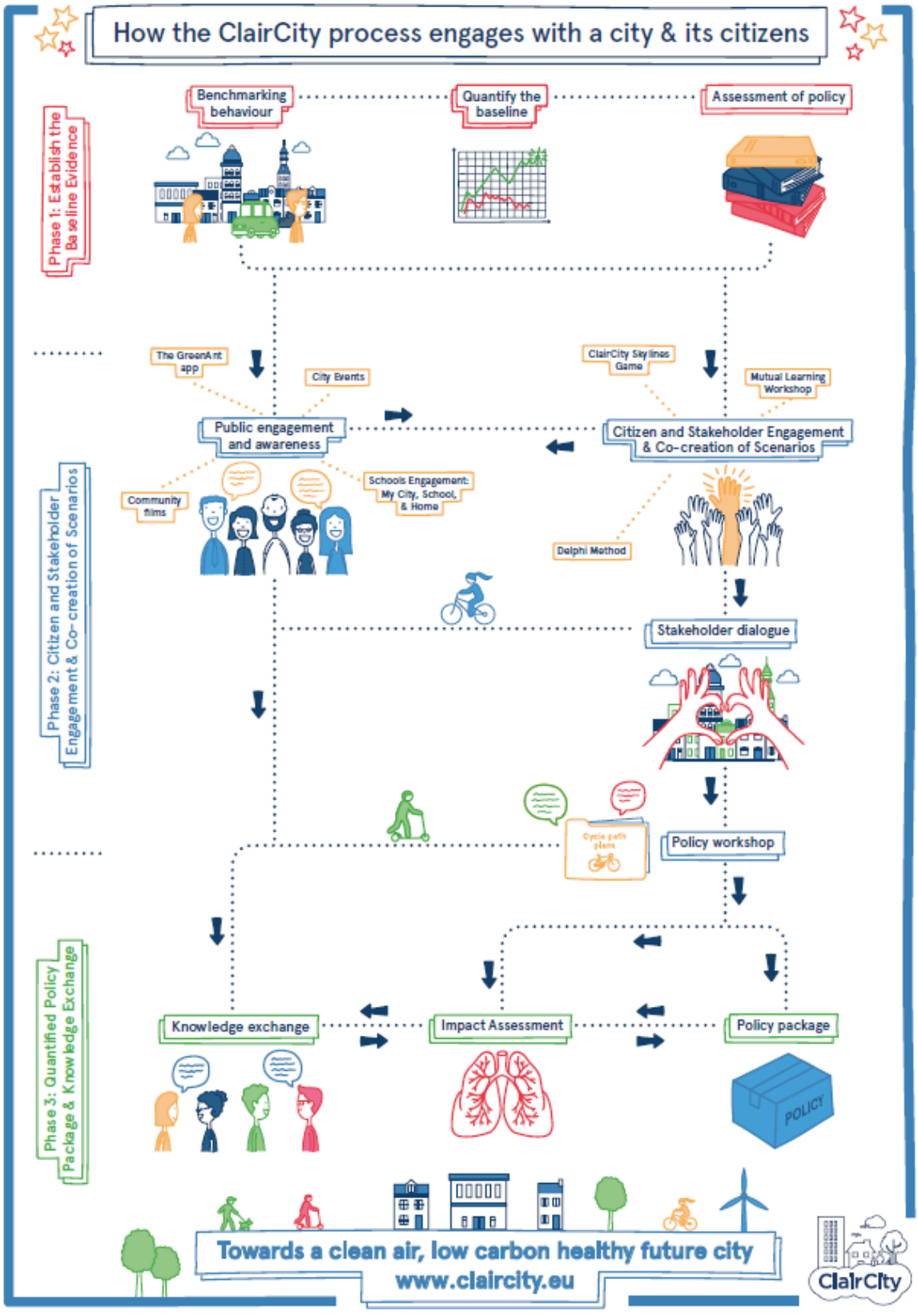

Figure 3: The ClairCity process

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4.4.2. Phase 2: Citizen and Stakeholder Engagement & Co-creation of Scenarios

Phase 2 has three key aims: (1) understand citizens' current behaviours, practices and activities, (2) enable citizens and stakeholder to co-create and visualise their low carbon, clean air, future city and (3) raise awareness of the environmental challenges and their solutions. Phase 2 utilised evidence from Phase 1 to help frame and inform the engagement activities. Phase 2 is achieved with the following main activities:

Citizen and stakeholder engagement & co-creation

- **The ClairCity Delphi method:** uses citizens as local experts to generated qualitative evidence of their entrenched behaviours and what enabling interventions would allow them to act and behave differently in future (WP4).
- **The Mutual Learning Workshop**: brings citizens and stakeholders together to debate the challenges facing the city and co-create policy interventions for cleaner, healthier futures (WP4).
- **The ClairCity Skylines Game**: 'crowd-sources' the public perceptions and public acceptability of difference policy interventions (WP4)
- **The Stakeholder Dialogue Workshop**: Citizens and stakeholders come together to review and debate the Delphi, Mutual Learning Workshop and ClairCity Skylines evidence and co-create scenarios for a low carbon, clean air, health futures (WP4 and WP7).
- **Modelling**: The scenarios generated in the Stakeholder Dialogue Workshop go through a rapid quantification step (WP5) and are then returned to the local citizens/stakeholders to discuss in a Policy Workshop (WP6) and to agree a single Unified Policy Scenario (WP7).

Public Engagement & Awareness

Additional awareness raising activities are also implemented across the project in each city (WP4). These include:

- **The GreenAnt App**: which allows citizens to becomes a citizen scientist and monitoring their transport activities, emission generation and exposure using mobile GPS data.
- **The School Competition**: My City, My School, My Home engages young people in the air quality, carbon and public health debate utilising an online platform for the students to select the interventions that influence their housing, transport and use of resources in order to be able to design tools for change towards smart consumption, reduced emissions and healthy lifestyles.
- **Community films**: Learning from the elderly filming activity engages the older, potentially vulnerable, community to talk about the changes in their city, their personal mobility and the steps they take to minimise their exposure.

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- **The City Day**: Discovering my City helps disseminate the final project results and provide healthy and smart tips to promote non-motorised mobility of citizens by highlighting availability and benefits of walking and cycling routes in the city.

4.4.3. Phase 3: Quantified Policy Package & Knowledge Exchange

The primary aim of the final Phase 3 is to collate the evidence and lessons learned from Phase1 and Phase 2 to generate a quantified, bespoke, citizen-led and citizen-inclusive policy package for each city. Phase 3 is achieved with the following main activities:

- **Knowledge Exchange**: Collation of transferrable lessons and steps for better practice based on the experiences of the ClairCity project to inform other environmental and public health practitioners (WP3, WP4, WP5, WP7).
- **Impact Assessment**: Rapid quantification of the scenarios generated in the Stakeholder Dialogue Workshop (WP4) and detailed impact assessment of the final Unified Policy Scenario generated in the Policy Workshop (WP6). This quantification includes an assessment of the source apportionment by behaviour or purpose; air quality emissions and concentrations, carbon emissions, air pollution related health impact and interventions cost analysis (WP5).
- **Policy Package**: Development of a bespoke Policy Package for each city drawing together the findings from across the whole project (WP7).

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5. Evaluation Rationale

Public engagement during the research process and with the research results was critical for the success of the project. ClairCity aimed to take citizen engagement with future air quality policymaking one step further by carefully examining existing policy approaches, citizens' views on desired future policies, as well as city action perspectives and their limitations. By framing the source apportionment of emissions, social practices, and city to national policies from the perspective of the citizen demographics and daily practices, the project aimed to make air pollution and carbon emissions and the associated health implications relatable to individual and societal actions, with a core Communication Goal of raising awareness of air quality. This Evaluation Report will examine whether the Objectives and Goals set out in the ClairCity Communication Plan D2.1, the engagement methods outlined in the ClairCity Evaluation Framework D2.2, and the aims outlined in the ClairCity Innovation and Impact Plan D2.9 have been achieved, in particular referring to Research Objective 4.2.4:

> *"ClairCity will raise awareness of air quality challenges and their solutions through proactive dissemination of outcomes and realisation of the innovation potential and impact".*

5.1. Researchers and public engagement with research

ClairCity sits within a global context for public engagement with science and technology within the science communication field[2]. Worldwide, there is continuing encouragement (funded and policy driven) for more researchers to engage with the public around their research[3]. The UK National Coordinating Centre for Public Engagement (NCCPE) defines public engagement thus:

> *"Public engagement describes the myriad of ways in which the activity and benefits of higher education and research can be shared with the public. Engagement is by definition a two-way process, involving interaction and listening, with the goal of generating mutual benefit". (NCCPE, online)[4].*

[2] Davies, S.R. (2013). Constituting Public Engagement: Meanings and Genealogies of PEST in Two U.K. Studies. *Science Communication*. doi: 10.1177/1075547013478203.

[3] Poliakoff, E. & Webb, T. (2007). What factors predict scientists' intentions to participate in public engagement activities?. *Science Communication,* 29(2), p. 242.

[4] National Coordinating Centre for Public Engagement. (2014). What is public engagement? Available at: http://www.publicengagement.ac.uk/what/ [Assessed September 2016].

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ClairCity was also designed to fulfil the principles of upstream engagement, outlined in the EU 'Responsible, Research and Innovation' toolkit as:

> "*Doing science and innovation with society and for society, including the involvement of society 'very upstream' in the processes of research and innovation to align their outcomes with the values of society".*

Eight different audience groups in the six cities/regions were identified in the deliverable D2.1 Communication Plan (see **Error! Reference source not found.** and Figure 34 for details), along with how these related to the ClairCity Key Messages and Communication Goals. As such, this Evaluation Report will explore how successfully ClairCity Communications reached these audiences, and what changes or impacts can be detected in audiences through these efforts.

Table 1: Audience communication platforms

Audience	Specific messages	Platforms
Internal Consortium Members (including City Region Partners, Advisory Board and EU officials)	**Updates on WP progress, opportunities and challenges. Literature, datasets and models from WPs. Perceptions and attitudes arising from citizen engagement (WP4).**	**Internal email newsletter updates; Sharepoint database; monthly EMG teleconference; training teleconferences; face-to-face annual meetings; ClairCity Data Portal.**
International Associate Partners	**Updates on WP progress, opportunities and challenges. Literature, datasets and models from WPs. Perceptions and attitudes arising from citizen engagement (WP4).**	**External newsletter; targeted email communications identified by city partners; attendance at key meetings or conferences; journal papers and reports; external website with links to Game, App, Schools Competition and My City videos; social media; media outputs**
Identified City Partner stakeholders	**Recruitment to questionnaires and Delphi process (WP4.1).**	**Targeted email communications; social media; attendance at key local meetings; media where appropriate**
	Recruitment to Mutual Learning Stakeholder Workshops (WP4.4.1)	**Targeted email communications; social media; attendance at key local meetings; media where appropriate**
	Recruitment to Policy interviews (WP6)	**Targeted email communications; social media; attendance at key local meetings.**

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	Project updates, literature, datasets and models from WPs.	External newsletter; targeted email communications; attendance at key local meetings
Industry and relevant Professional Associations or Trade Bodies	Recruitment to Policy interviews (WP6)	Targeted email communications; social media; attendance at key local meetings
	Project research results	External newsletter; journal papers and reports; attendance at key meetings or conferences; infographics and written materials; external website with links to Game, App, School Competition and My City videos; social media; media outputs.
Local policymakers	Sharing project with constituents/organisations for recruitment and awareness	Targeted email communications; briefing notes for city councillors/others where appropriate; attendance at key local meetings; social media.
	Recruitment to Policy interviews (WP6)	Targeted email communications; social media; attendance at key local meetings.
	Project research results	External newsletter; journal papers and reports; attendance at key meetings or conferences; infographics and written materials; external website with links to Game, App, School Competition and My City videos; social media; media outputs.
National/EU policymakers	Sharing project with constituents/organisations for recruitment and awareness	Targeted email communications; social media; attendance at key local, national, EU and international meetings.
	Project research results	External newsletter; journal papers and reports; attendance at key meetings or conferences, including EU events; infographics and written materials; external website with links to Game, App, School Competition and My City videos; social media; media outputs; activities in partnership with ICARUS and iSCAPE projects.
Academic researchers	Project research results	Journal papers and reports; attendance at key meetings or conferences; infographics and written materials; external newsletter; external website with links to Game, App, School Competition and My City videos; social media; media outputs.
EU public in City Partner cities	Recruitment of citizens to Delphi process (WP4.1)	Targeted communications with champion groups; attendance at key local meetings; external website; social media; media outputs.

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	Recruitment of older people to My City Day (WP4.4.3)	**Targeted communications with champion groups; attendance at key local meetings; external website; social media; media outputs.**
	Recruitment of teachers to schools competition (WP4.4.2)	**Targeted communications with teachers; attendance at key local meetings; external website; social media; media outputs.**
	Recruitment to ClairCity Game (WP4.2)	**Targeted emails to champion groups and research participants; external website; links from App; social media; media outputs.**
	Recruitment to ClairCity App (WP4.3)	**Targeted emails to champion groups and research participants; external website; links from Game; social media; media outputs.**
	General project updates and results for previous research participants	**External newsletter; targeted emails to champion groups and research participants; external website with links to Game, App, School Competition and My City videos; social media; media outputs.**
Wider international public	**General project updates and results**	**External newsletter; external website with links to Game, App, School Competition and My City videos; social media; media outputs; attendance at live science events.**

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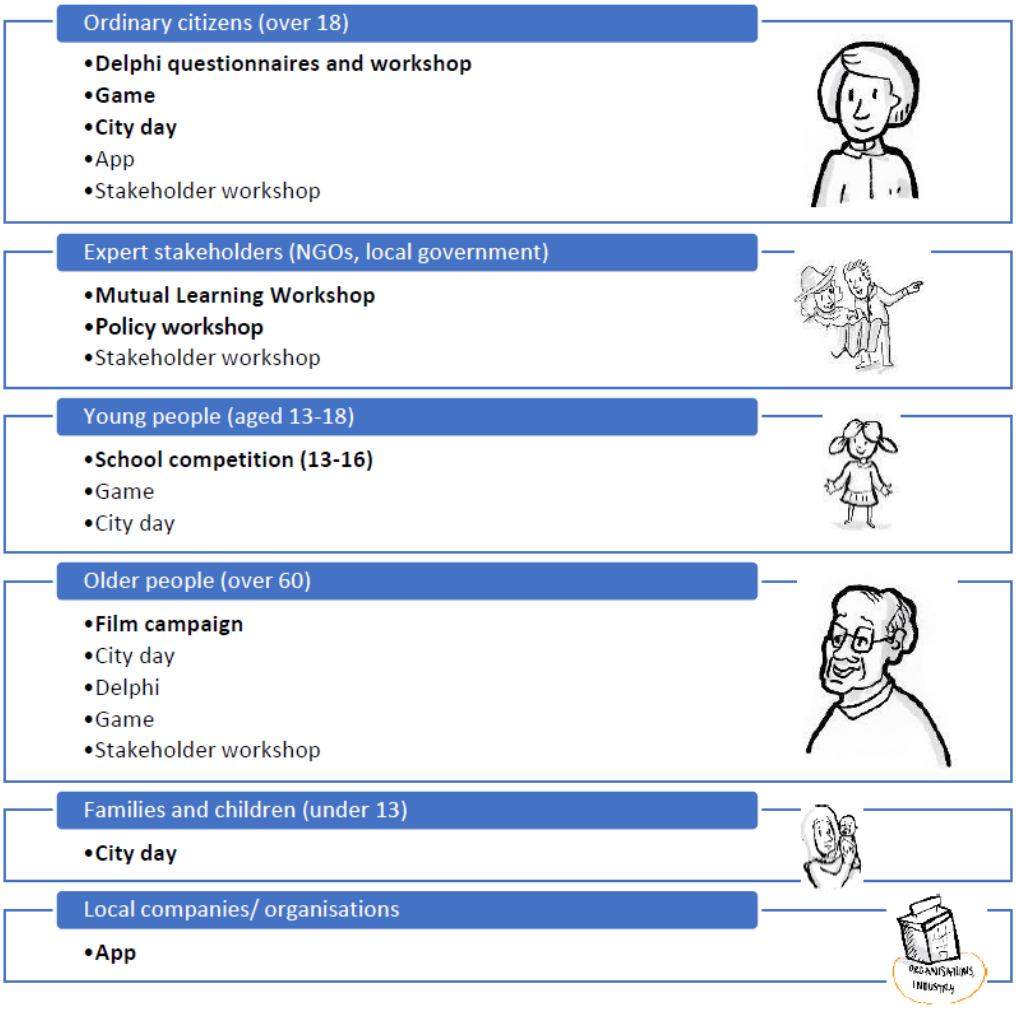

Figure 4 Engagament activities and their target audiences

5.2. Learning about air quality

Raising awareness of air quality is a broad concept, and as such the Communication Plan D2.1 outlined how 'learning' about air quality was the central aim of ClairCity communications. Learning is a broad concept described in the Informal Science Learning literature and outlined in the 'Generic Learning Outcomes'[5], whereby learning may involve the development or deepening of skills, knowledge, understanding, values, ideas and feelings.

[5] Museums Libraries and Archives Council. (2014). Active Engagement with Experience. Retrieved February 4, 2014, from http://www.inspiringlearningforall.gov.uk/learning/index.html

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These impacts were measured across five core domains as outlined in **Error! Reference source not found.**:

- Attitudes and Values
- Knowledge and Understanding
- Enjoyment, Inspiration and Creativity
- Skills
- Behaviour and Progression

Evaluation of the WP activities attempted to measure the impacts of the ClairCity project across these domains, for all identified audiences. The intended outcomes were measured against the Key Messages outlined in the Communication Plan D2.1.

Table 2: Generic Learning Outcomes (GLO)

GLO domain	Example of outcomes
Attitudes and Values	▪ **Perceptions** ▪ **Opinions about ourselves (e.g. self-efficacy)** ▪ **Opinions or attitudes towards other people** ▪ **Increased motivation** ▪ **Attitudes towards an organisation** ▪ **Positive and negative attitudes in relation to an experience**
Enjoyment, inspiration, creativity	▪ **Having fun** ▪ **Being surprised** ▪ **Innovative thoughts** ▪ **Creativity** ▪ **Exploration, experimentation and making** ▪ **Being inspired**
Knowledge and Understanding	▪ **Knowing what or about something** ▪ **Learning facts or information** ▪ **Making sense of something** ▪ **Deepening understanding** ▪ **Making links and relationships between things**
Skills	▪ **Knowing how to do something** ▪ **Being able to do new things** ▪ **Intellectual skills** ▪ **Social skills** ▪ **Communication skills** ▪ **Physical skills**
Activity, behaviour, progression	▪ **What people do** ▪ **What people intend to do** ▪ **What people have done**

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- **Reported or observed actions**
- **A change in the way that people manage their lives**

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6. Evaluation Strategy

6.1. Methodology

Evaluation is a process that takes place before, during and after an activity. Formative evaluation allowed our researchers to adapt to meet the needs of audiences, while summative evaluation assessed the quality of the activity being delivered, the delivery process itself and what impacts, if any, it had on the participants. Evaluation has been crucial to understand if project aims and objectives were achieved and to critically reflect on the activities and delivery processes, as well as to assess if the project met the objective of raising awareness of air pollution, carbon emissions, and health. This evaluation data will be used to improve activities, better plan future events and to demonstrate achievements[6].

6.1.1. Ethics Approval and Participant Consent

Full ethics approvals were achieved for all elements of the project, as outlined in D8.1 and D8.2 Ethics Framework, meeting requirements for POPD 1&3. Participants' data were managed in accordance with D1.9 Data Management Plan. All research participants in this project gave informed consent before participating in the engagement activities or evaluation methods. The evaluation process was approved by of the University of the West of England (Bristol UK) Research Ethics Committee through several ethics applications, as highlighted in Table 3.

6.1.2. Research Questions

A variety of methods were used to evaluate the individual events and activities and the project overall. The evaluation methodology was designed to collect high quality data in an easy and straightforward way that works for all partners and across cities, focusing primarily on the partners and surveys for research participants. All evaluation methodologies attempted to answer the following research questions, which cut across all the WPs.

[6] RCUK (n/d). *Excellence with impact*. Available at http://www.rcuk.ac.uk [Assessed September 2016].

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Question 1: Who did the project engage with?

Objective 1: Determine participants' age, gender, level of education and country of origin

Objective 2: Examine whether the project engaged with the identified audiences

Objective 3: Investigate if the project has reached any other audiences

Question 2: How well did the project raise awareness of air pollution, carbon emissions and health?

Objective 4: Examine indicators of awareness, attitudes, knowledge and skills

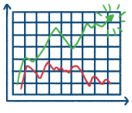
Question 3: Are people who have engaged with the project planning to or doing something different? (e.g. walking instead of driving, planning to contact their council)

Objective 5: Examine indicators of planned behaviour

Question 4: What differences can we see across countries, demographics and Communication Platforms?

Objective 6: Examine audience make-up between the Platforms and Cities

Objective 7: Stratify indicators of awareness, attitudes, knowledge, skills and planned behaviours according to Platforms and Cities



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6.1.3. Research Methods

Online questionnaires

Online questionnaires were a convenient method to gather participants' views and thoughts about events and activities. By using online questionnaires, we did not take away the participants' attention from the activities they were engaging with. In addition, online questionnaires took away the pressure of being interviewed, making participants more comfortable[7].

The online questionnaires and pop-up windows with questions were designed to be short, quick and easy to complete with both open and closed questions, to ensure a variety of data was collected. However, the majority used closed questions, as this assisted in making translation and data analysis straightforward. Closed questions present the respondents with a list of options and do not discriminate against less responsive participants[8]. Open-ended questions allowed participants to provide answers in their own terms[9] but were kept to a minimum, since they tend to have a lower response rate[7].

Online questionnaires and pop-up windows were used to evaluate:

- WP4.1 Delphi process
- WP4.2 Skylines Game
- WP4.3 GreenANTS App
- WP4.4.2 My City Videos
- WP4.4.3 Schools activities
- Stakeholder and Policy Workshops

In some instances, the online questionnaires were adapted into paper questionnaires at the request of specific cities and partners, as this method was perceived as more appropriate than using an online questionnaire. For consistency, the questions asked remained the same. Both online and paper questionnaires were translated and distributed to participants in their native languages.

Interviews with ClairCity staff

Interviews are judged in the literature to be a useful evaluation method as they directly access the observations, insights and the experiences of the participants[10].

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[7] Couper, M, Traugott, M and Lamias, M. (2002). 'Web Survey Design and Administration', *Public Opinion Quarterly*, Vol. 35, pp.230-53.

[8] De Vaus, D. (2002). *Surveys in Social Research. Social Research Today*. 5th ed. New York: Routhedge.

[9] Groves, RM, Fowler, FJ, Couper, MP, Lepkowski, JM, Singer, E and Tourangeau, R. (2004). *Survey Methodology*. Wiley Series in Survey Methodology. Wiley-Interscience, 1st Edition.

[9] Tong, A., Sainsbury, P., and Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ), a 32-item checklist for interviews and focus groups. *International Journal of Quality in Health Care*, 19(6), 349–357.

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All staff involved in engaging with the public, across all cities, were invited to take part in a short interview. The interviews were conducted in English and aimed to explore the staff's overall experience in involving and working with the public as part of ClairCity. The questions further explored their experiences, challenges and new approaches used.

The in-depth interviews occurred face-to-face, over phone or Skype or via email, but only if the participant requested this option (due to not feeling confident speaking in English). The interview was designed as semi-structured and the schedule included open-ended questions allowing participants to provide answers in their own terms[8].

Interviews with ClairCity staff took place at two timepoints:

- Halfway through the project (Month 24 – April 2018);
- During the last six months of the project (Months 42-48 – October 2019 – March 2020).

We aimed to interview a city buddy partner and a city partner per city, across both rounds of interviews[11].

Other methods

The original evaluation plan included a few additional evaluation methods, such as reflective logs and feedback boards. However, as the project developed, these methods proved difficult to implement across cities and a decision was made not to use them. This was mainly due to the capacity of staff in each city while implementing WP4 engagement methods to the tight delivery timetable. Project partners and the evaluation team felt it was too onerous to use additional evaluation methods and a decision was taken to concentrate the efforts on the methods more likely to provide quality evaluation data.

6.2. Engagement evaluation

The research methods were utilised to assess the different research questions across all of the WPs, each aimed at different audiences. **Error! Reference source not found.** describes the methods used in each WP and task and refers to the available full reports, for further information.

[11] Each city partner has a city buddy within the consortium to support them in the implementation of activities, collecting data etc. UWE was the city buddy for Bristol; Trinomics was the city buddy for Amsterdam; UAVR was city buddy for Aveiro; Techne was city buddy for Liguria; and REC was the city buddy for both Sosnowiec and Ljubljana.

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Table 3: Evaluation methods used in each Work Package

WP/Task	Methods	Full Report available	Ethics Reference
1 Project Management 	Interviews with ClairCity staff – Round 1 (Appendix 10.7) Interviews with ClairCity staff – Round 2 (Appendix 10.8)	*D1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8* Internal Progress Reports	UWE REC REF No: FET.17.02.023 27th March 2017
2.1 Communications – Media and Events 	Media coverage Online coverage Social media coverage Photos of events Academic conferences, reports and journals Photos of events	*D1.2: Communications Plan*	UWE REC REF No: FET.17.04.037 26th July 2017
3 Behaviour 	Content analysis Interviews with ClairCity staff (Appendix 10.7; 10.8) Questions in online surveys and autonomous methods (Appendix 10.1; 10.4)	*D3.1: Review of social science in Air Quality and Carbon Management* *D3.2: Academic paper on the application of social science in Air Quality and Carbon Management* *D3.4: Good practice guidelines to generate practice-activity data* *D3.6: Environmental Justice Report*	Incorporated within other ethics approvals
4.1 Delphi Process 	Post-workshop online/paper questionnaire (Appendix 10.1; 10.4) Photos of events	*D4.7: Role of Delphi in Air Quality and Carbon Management*	UWE REC REF No: FET.17.03.031 30th March 2017

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4.2 Skylines Game 	**Pop-up window when user finishes the game; short number of questions (Appendix 10.4)** **User metrics (number of plays, length of time playing, number of downloads etc.)**	***D4.10: User Game Manual and Data Report***	**UWE REC REF No: FET.17.02.023 6th March 2016 (evaluation)** **UWE REC REF No: FET.17.04.037 26th July 2017 (engagement)**
4.3 GreenANTS App 	**Pop-up window when user opens/closes the app; short number of questions** **User metrics (number of plays, length of time playing, number of downloads etc.) (Appendix 10.5)**	***D4.13: User App Manual and Data Report***	**UWE REC REF No: FET.17.02.023 6th March 2016 (evaluation)** **UWE REC REF No: FET.17.04.037 26th July 2017 (engagement)**
4.4.1 Mutual Learning Workshops 	**Post-workshop evaluation through paper questionnaire (Appendix 10.1; 10.2)** **Photos of events**	***D4.16: Mutual Learning Workshop Analysis Report***	**UWE REC REF No: FET.17.03.031 30th March 2017**
4.4.2 Schools Competition 	**Teachers: post-event questionnaire collected by email/online (Appendix 10.1; 10.3)** **Photos of events**	***4.4.2: School competition report, Aveiro Region, January 2020*** ***4.4.2: School competition report, Liguria Region, April 2019*** ***4.4.2: School competition report, Sosnowiec, April 2019/update February 2020*** ***4.4.2: School competition report,***	**UWE REC REF No: FET.17.02.023 6th March 2016 (evaluation)** **UWE REC REF No: FET.17.04.037 26th July 2017 (engagement)**

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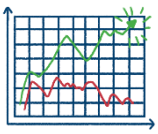
		Ljubljana, March 2020 (in progress) ***Bristol school activity report, July 2019*** ***School activity report, The Netherlands, (Amsterdam) January 2020*** ***4.4.2: Summary report, April 2020 (in progress)***	
4.4.3 My City Events 	**Participant videos** **Post-event questionnaire collected online (Appendix 10.1; 10.6)** **Photos of event**	***D4.18: City Day – First City*** ***D4.19: City Day – Last City***	**UWE REC REF No: FET.17.02.023 6th March 2016 (evaluation)** **UWE REC REF No: FET.17.04.037 26th July 2017 (engagement)**
5 Quantification 	**Analysis of reports** **Interviews with ClairCity staff (Appendix 10.7; 10.8)** **Questions in online surveys (Appendix 10.1; 10.2)**	***D5.5, D5.6 (assessment of impacts first & last city)*** ***D5.7: (city impact analysis report)***	**Incorporated within other ethics approvals**
6 Policy 	**Analysis of reports** **Post-workshop evaluation through online/paper questionnaire (Appendix 10.1; 10.2)** **Photos of events** **Interviews with ClairCity staff (Appendix 10.7; 10.8)**	***D7.6: Final Cross-City Policy Analysis Report***	**UWE REC REF No: FET.16.09.004 21st October 2016**

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	Questions in online surveys (Appendix 10.1; 10.4)		

6.3. Evaluation Dissemination

The present in-depth Evaluation Report D2.8 will be shared at the end of the project, and has contributed to the D2.10 Business Plan Report outlined in the Impact and Innovation Plan D2.9. The Evaluation Report will be disseminated through the ClairCity Communication Platforms, the UWE Bristol Science Communication Unit[12] and through ClairCity Associates as well as the EU Commission. The report will be permanently stored and available on the ClairCity website, the ClairCity Zenodo archive[13] and the UWE Bristol Research Repository.

Data emerging from the evaluation has been and will continue to be further disseminated in academic papers and conference presentations. The Communications team is targeting both science communication and public engagement academic journals (e.g. Science Communication, JCOM – The Journal of Science Communication, Citizen Science: Theory and Practice) as well as air quality journals. The same strategy is being used for conferences. So far, the evaluation data has been disseminated in or is planned to be disseminated at:

- **Academic publications:**
  - Sardo, M, Fogg-Rogers, L. et al., (in preparation). "Communication methods for air pollution – an international comparison of communication methods for engaging publics with air pollution" (working title)
  - Sardo, M, Fogg-Rogers, L. et al., (in preparation). "Air pollution practitioners: moving from first order to third order engagement. An international perspective on engaging the public with air pollution." (working title)

- **Conference presentations:**
  - Chatterton, T., Fogg Rogers, L., Boushel, C., & Hayes, E. T. (2017, October). *Our future with clean air: ClairCity*. Presented at Changing Minds: Communicate Symposium on Behaviour Change, Bristol, UK.
  - Fogg Rogers, L. (2017, September). *Society vs the individual: How can we work together to enable behaviour change?*. Presented at Community Psychology Festival 2017, Bristol, UK.
  - Fogg Rogers, L., Boushel, C., Chatterton, T., & Hayes, E. T. (2017, June). *Society vs the individual - How can we work together to enable behaviour*

[12] https://www1.uwe.ac.uk/research/sciencecommunicationunit.aspx
[13] https://zenodo.org/communities/claircity/?page=1&size=20

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change?. Presented at Conference on Communication and the Environment, Leicester, England.

- Fogg-Rogers, L. & Sardo, M. (2020, May). *Act Now: Is the time for science communication about climate change over, or just beginning?* Panel presentation at the Public Communication of Science and Technology 2020 Conference. Aberdeen, Scotland, UK. Postponed due to Covid-19.
- Hayes, E., et al., (2019, Sept). *Public engagement and citizen behaviour: a new frontier for air quality management*. Keynote presentation at the World Clean Air Congress, Istanbul, Turkey
- Hayes, E., et al., (2019, Sept). *Integrating citizens behaviour and air quality management to raise public awareness in European cities*. Presentation at the World Clean Air Congress, Istanbul, Turkey
- Hayes, E., et al., (2019, June). *Using game technology to engage citizens and understand the public acceptability of air quality interventions in EU cities*. Invited presentation at the Air Pollution Conference, Aveiro, Portugal

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7. Evaluation Results and Discussion

7.1. Overall project engagement

A total of **8302** people from ClairCity cities/regions directly engaged with the project over its duration (this excludes social media and website reach). **Error! Reference source not found.**5 shows the engagement reach across cities/regions and engagement tool. This is aligned with our original recruitment targets in **Error! Reference source not found.**; overall the project more than met its engagement targets.

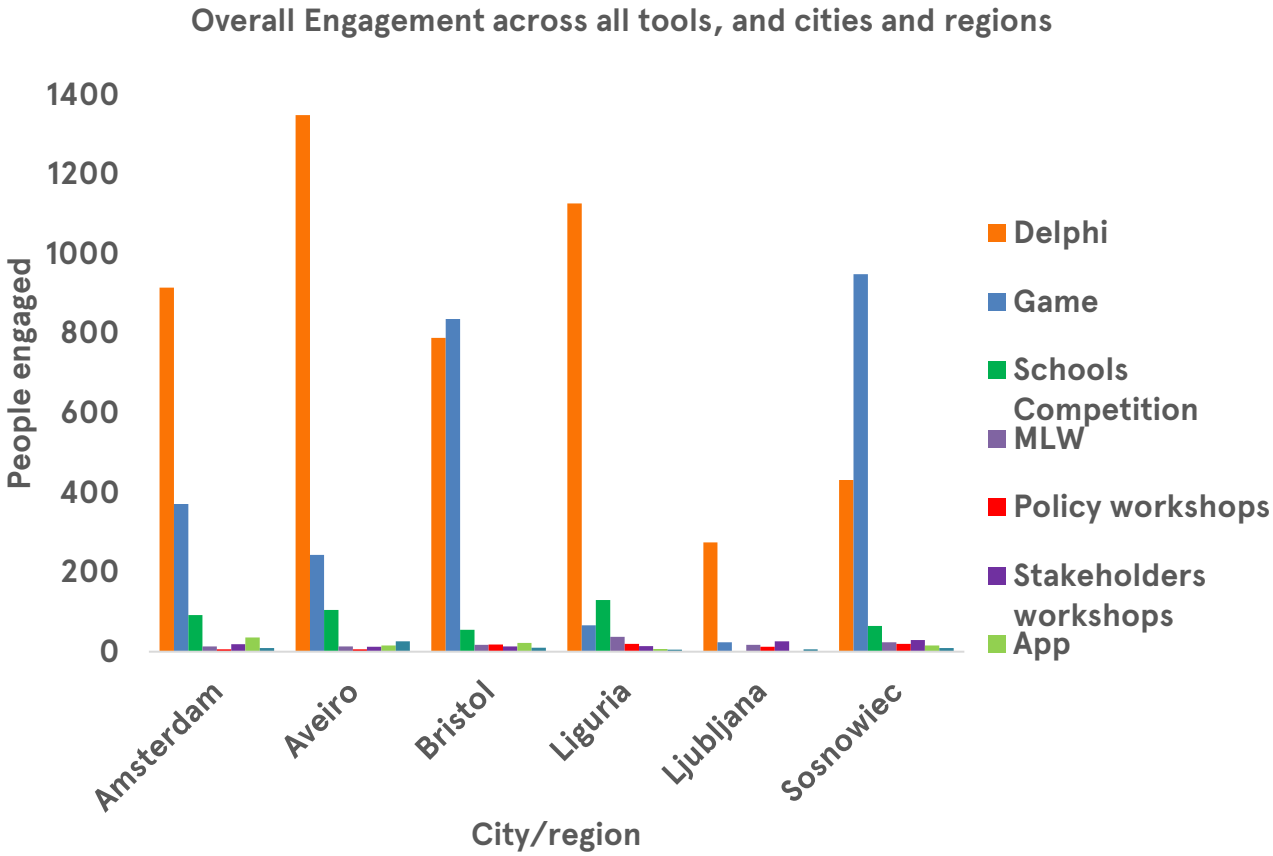

Figure 5: Total engagement across all engagement tools, and cities and regions

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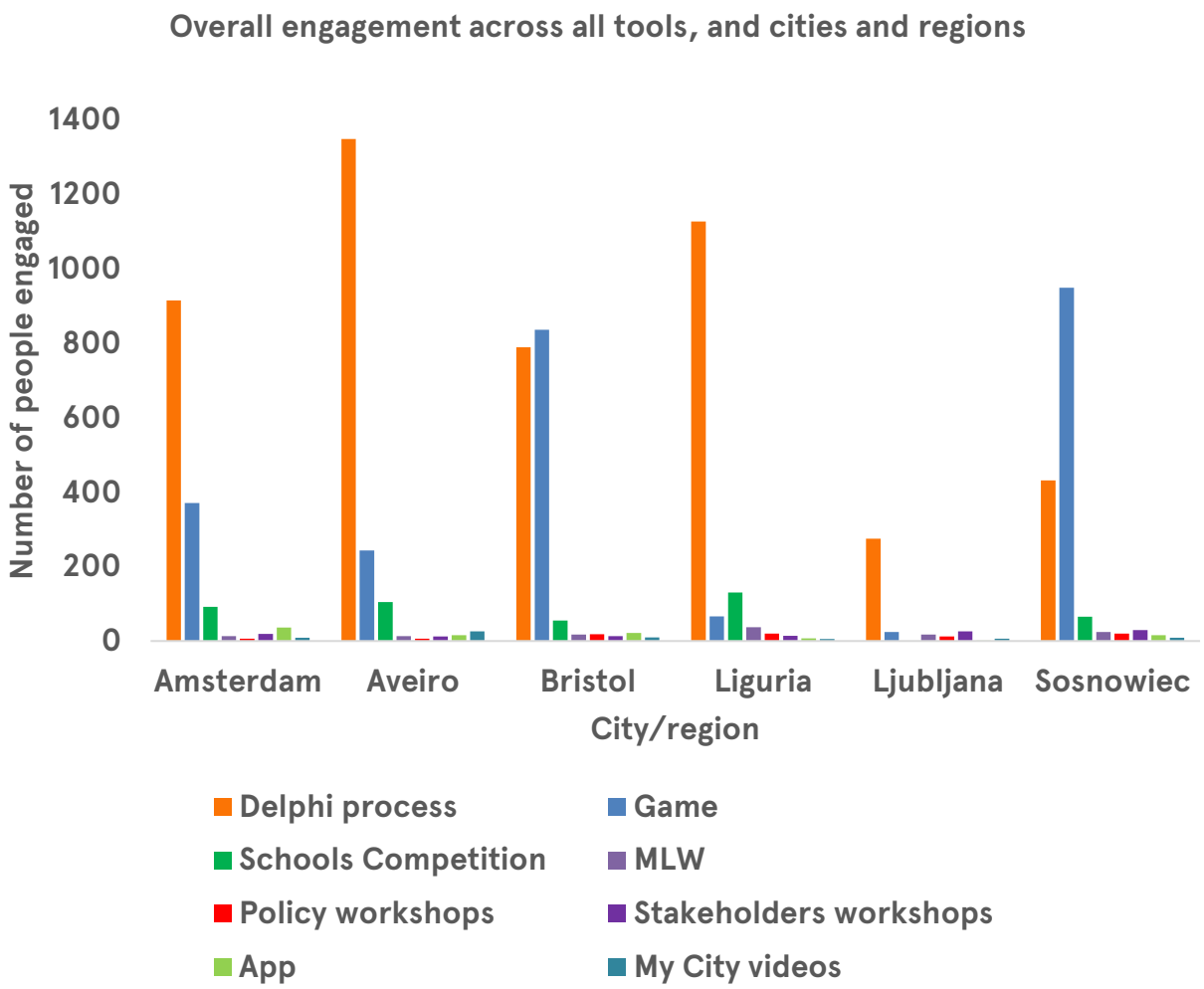

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Table 4: Communication objectives and measurements for WP2 (communications) WP4 (public engagement)

Task	Communication objective (aimed for)	Communication Reach (number collected to Jan 2020)	Measure of success
2.1 Communications 	Aimed to raise awareness of project key messages by reaching over 50,000 citizens during the project lifetime.	770,253 impressions on Twitter 1418 Facebook followers across all cities	The project's social media proved to be very successful with a wide reach through engaging with stakeholders' social media accounts.
4.1 Delphi workshops 	Aimed for over 500 completed online citizen surveys Aimed to engage 240 stakeholders in Delphi workshops, identified from a broader number of survey respondents	3297 completed online citizen surveys. A total of 4887 participants in the Delphi process. 149 participants in the Delphi Workshops (Round 1 to 3).	Whilst each city showed variability in recruiting participants, overall the Delphi process more than met the overall recruitment targets for the project.
4.2 Skylines Game 	Aimed to host over 1500 players.	2489 individual players across the six cities. 2,800 individual players across the world.	Whilst each city showed variability in recruiting participants, overall Skylines more than met the overall recruitment targets for the project.
4.3 GreenANTS App 	Aimed to host over 1500 players.	The app did not reach full roll-out due to technical issues and instead was tested by city	The app design process changed, and so GreenANTS was designed to reach Technology

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		partners. 98 people tested the app.	Readiness Level 3. This means it was tested by city partners instead as part of the design process.
4.4.1 Mutual Learning Workshops 	Aimed to engage approximately 150 stakeholders through Mutual Learning Workshops.	138 stakeholders engaged	The project reached 92% the target number (138/150) for the MLW. The city specific number was lower for Amsterdam, Aveiro Region and Ljubljana due to other parallel events but higher in Bristol and Liguria Region. The MLWs were successful in all cities/regions and provided useful scenario input for the Stakeholder Workshops.
4.4.2 Schools Competition 	Aimed to engage 60-90 schools in the project.	447 children engaged, across 26 schools Additionally, the British Science Association teaching pack contributed to by ClairCity had <102,000 downloads Primary schools (Bristol only):	In two cities (Amsterdam and Bristol) there was no uptake for the competition due to timings, the availability of teachers, and the availability of similar resources. Those cities took a different approach by giving lectures and sending

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		approx. 800 children reached	**education resources to teachers.**
4.4.3 My City 	**Aimed to engage over 60 older people to make films about non-motorised transport maps.**	**65 older people engaged**	**While each city showed variability in the success of this method, the project met the recruitment targets overall.**
6 Stakeholders and Policy workshops 	**Aimed to engage a network of up to 60 policymakers across Europe to which targeted policy lessons will be communicated.**	**113 stakeholders engaged through Stakeholders Workshops** **82 policymakers engaged through Policy Workshops**	**The project recruitment targets were met, with high engagement from city policymakers.**

7.2. Evaluation participant characteristics summary

The total number of participants who took part in some form of evaluation included 855 people across seven activities (Delphi, App, Game, Stakeholder, Policy, Schools, Video) held in six cities (plus a worldwide option for digital methods). The cities which recruited the most evaluation participants were Sosnowiec (*N*=353) and Aveiro (*N*=137). Figure 2Figure 6 shows feedback collected across cities/regions and engagement tool.

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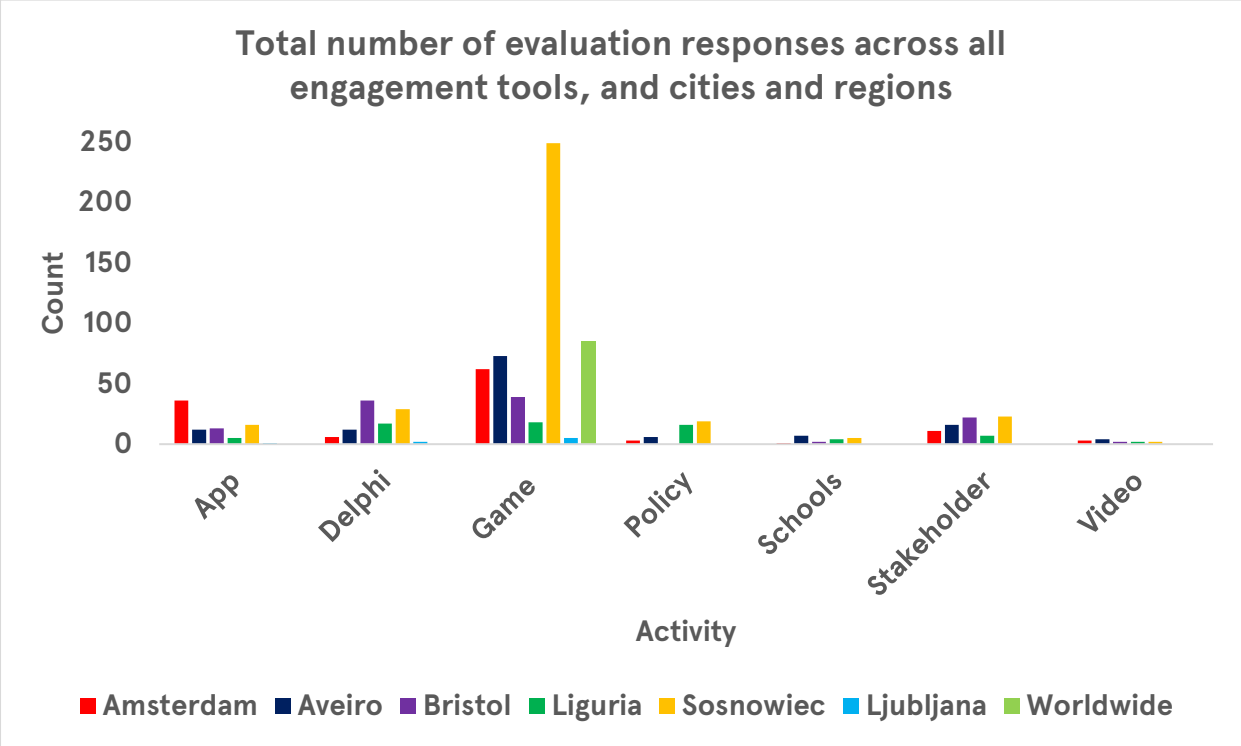

Figure 6: Total evaluation responses across all engagement tools, cities and regions

The evaluation objectives and measures outlined in Table 5 provide us with an indication of the success of the evaluation sampling. Return rates for evaluation are based on the literature as well as on our vast experience using surveys. Recent return rates from the literature: Funkhouser et al. (2014)[14] had between 2.5% and 26% return rate; Bulkley et al. (2016)[15] had 25%. The ClairCity evaluation sample rate was 855 surveys from 8302 participants, giving a 10% return rate.

As expected, there is substantial variation from city to city in the update of activities and input to the evaluation process. One of the founding principles of the ClairCity proposal was deliberately choosing diverse case study cities/regions, recognising that some activities may be successful and other not. This allowed the project to generate, implement and evaluate methodologies that were scientifically robust but with an inherent flexibility to account for the cities' diversity and the need for localisation and adaption of method as necessary. There is some variation across the case studies and to the regret of the ClairCity team, overall participation of Ljubljana was lower than originally anticipated and expected and that is visible both in the engagement numbers for the city and the corresponding evaluation dataset. This can partly be justified by staffing issues, as the partner was understaffed for

[14] Funkhouser, E., Fellows, J. L., Gordan, V. V., Rindal, D. B., Foy, P. J., Gilbert, G. H. and National Dental Practice-Based Research Network Collaborative Group (2014), Supplementing online surveys with a mailed option to reduce bias and improve response rate: the National Dental Practice-Based Research Network. J Public Health Dent, 74: 276–282.

[15] Bulkley J, Stoneburner A, Leo M, Clark A, Beadle K, Vesco KK. Design, implementation, and response rates from an online patient survey to assess genitourinary symptoms and related health care experiences of postmenopausal women. J Patient Cent Res Rev. 2016;3:225.

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some time. Having a city buddy who was not based in the country was likely an issue. To a lesser extent, the short gap in support due to the dissolution of REC may also have contributed to the lower engagement and evaluation numbers.

Table 5: Evaluation objectives and measurements

Task	Evaluation Objectives	Evaluation Reach	Measures of success
4.1 Delphi workshops 	**Achieve 48 completed online surveys (aiming for 20% of estimated 240 participants in total across all cities).** **Complete one observation session per workshop.** **Complete one reflective log per workshop.**	**Collected: 102 surveys.** **Collected: 13 self-reflections.** **The project evaluation targets were met.**	**Evaluation of:** • **Awareness of air quality, transport and health issues** • **Intentions to change behaviour individually or as a society**
4.2 Skylines Game 	**Achieve 300 completed surveys. (aiming for 20% of estimated 1500 in total across all cities).**	**Collected: 526 completed surveys (446 from ClairCity cities + 80 from other locations).** **The project evaluation targets were met.**	**Evaluation of:** • **Engagement with the game** • **User awareness of air quality, transport and health issues.**

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4.3 GreenANTS App 	**Achieve 300 completed surveys. (aiming for 20% of estimated 1500 in total across all cities.**	**Collected: 98 completed surveys.** **The project evaluation targets were not met. The app design process changed, and so GreenANTS was designed to reach Technology Readiness Level 3. This means it was tested and evaluated by city partners instead as part of the design process.**	**Evaluation of:** • **Engagement with the app** • **User awareness of air quality, transport and health issues.**
4.4.1 Mutual Learning Workshops 	**Monitored as part of the Delphi process and workshop evaluations.**	**Some informal feedback collected from participants in selected cities.**	**Included as part of the workshop evaluations.**
4.4.2 Schools Competition 	**Achieve 12-18 completed feedback forms from teachers (aiming for 20% of total 60-90 schools in the project).**	**Collected: 20 feedback forms from teachers.** **The project evaluation targets were met.**	**Evaluation of:** • **Knowledge and skills for improvement of air quality and public health and carbon footprint in homes, in schools and in the city**

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4.4.3 My City 	**Achieve 12 feedback board comments or suggestion cards (aiming for 20% of total 60 engaged older people).**	**Collected: 13 online/paper surveys** **The project evaluation targets were met.**	**Evaluation of:** • **Awareness of air quality, transport and health issues** • **Intentions to change behaviour individually or as a society**
6 Stakeholders and Policy Workshops 	**Achieve 12 completed online surveys (aiming for 20% of total 60 engaged stakeholders).** **Complete one observation session per workshop.** **Complete one reflective log per workshop.**	**Collected: 64 online/paper surveys (Stakeholders Workshops)** **Collected: 44 online/paper surveys (Policy Workshops)** **The project evaluation targets were met.**	**Direct feedback of stakeholders and policymakers in the network on usefulness of the policy lessons communicated**
Interviews with ClairCity staff 	**Added in to the Evaluation Framework to show impacts on researchers from public engagement.**	**Collected: 27 in-depth interviews (12 in round one and 15 in round two).**	**Evaluation of:** • **Successes and challenges of the project** • **Learning and new skills** • **Awareness of public engagement and citizen involvement** • **Intentions to change behaviour individually or as a society**

7.2.1. Gender

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Most activities were fairly evenly split between male and female evaluation participants, with the exceptions being the stakeholder workshops (attracting more senior members of organisations, who tend to be men) and the Skylines game. In total, 281 females (37.5%) participated in the evaluation, compared to 469 males (62.5%) (with 109 participants preferring not to identify themselves).

The activity which collected the most evaluation reports was the game (*N*=534); this high level of male players has meant that the overall evaluation sex ratio is skewed towards men (Figure 7). Cities which recruited a high number of game players therefore showed a similar skew towards more male participants per city, such as Bristol and Sosnowiec (Figure 8).

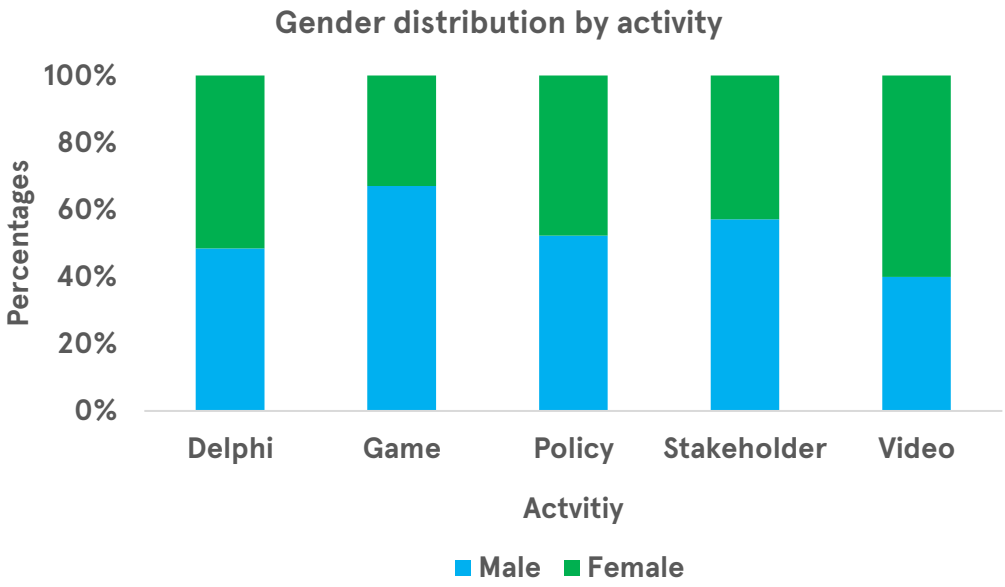

Figure 7: Gender distribution by activity

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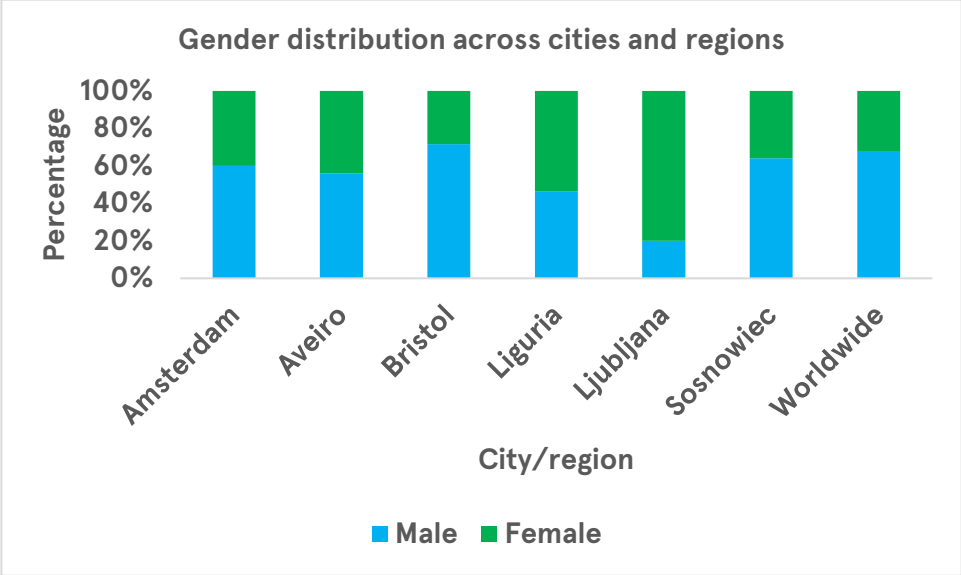

Figure 8: Gender distribution by city and region

7.2.2. Age

Overall, the mode age category was 16-24 year olds (Figure 9), encompassing 25% of participants, due to high participation in the game. Cities which recruited a higher number of game players tended to have younger evaluation participants. However, overall, all age categories are quite well represented (see Figure 8) due to different engagement activities appealing to different ages of people (see Table 6). For instance, the workshop activities (Delphi, policy, and stakeholder workshops) attracted 66% of people in the age category of 45-54 year olds and 83% of 55-64 year olds. This is also broken down by age and gender in Figure 8, and by different cities in Figure 11 and Figure 12 – note not all participants stated their age, and so the numbers do not add up to 855.

Table 6: Age comparison for evaluation participants

		Age						Total
		13-15	16-24	25-34	35-44	45-54	55-64	
Activity	Delphi	0	12	12	16	32	25	97
	Game	72	197	140	120	25	6	560
	Policy	0	2	9	13	6	4	34
	Schools	0	0	4	8	5	0	17
	Stakeholder	0	2	4	20	25	11	62
	Video	0	1	2	2	2	2	9
Total		72	214	171	179	95	48	779

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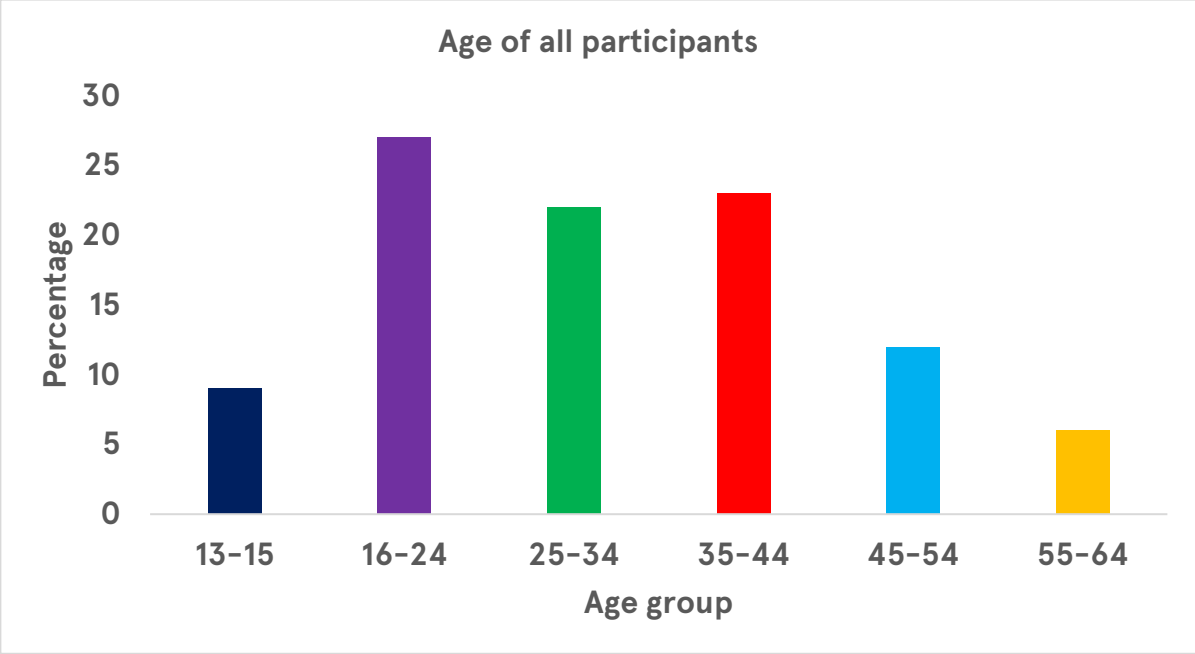

Figure 9: Overall spread of evaluation participants' ages

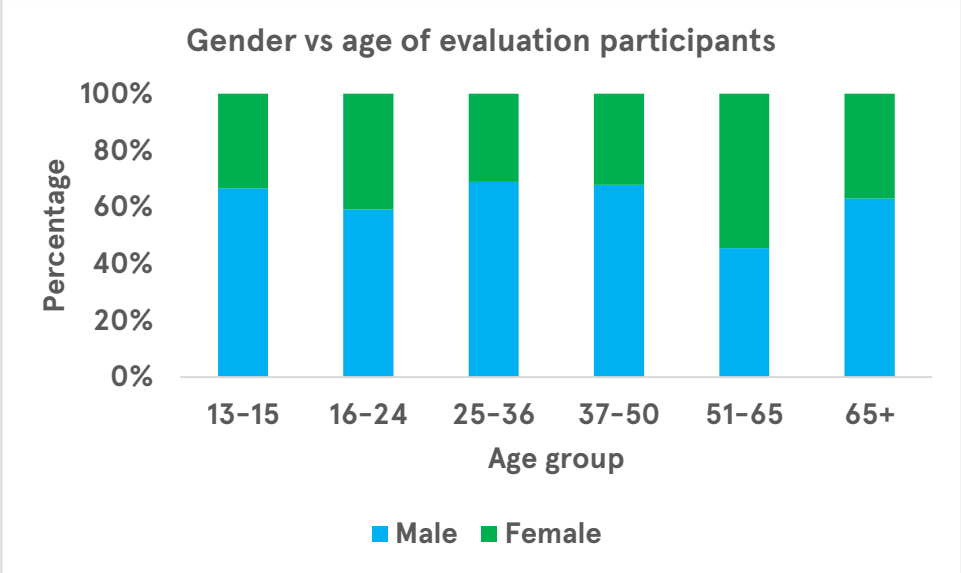

Figure 10: Gender and age distribution of evaluation participants

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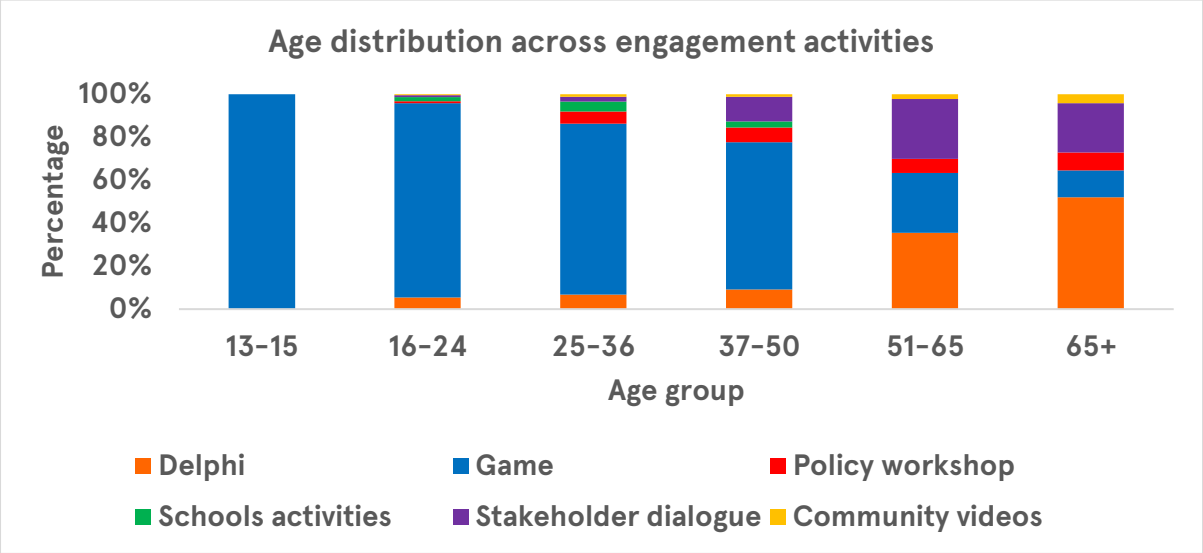

Figure 11: Age distribution of evaluation participants across engagement tool

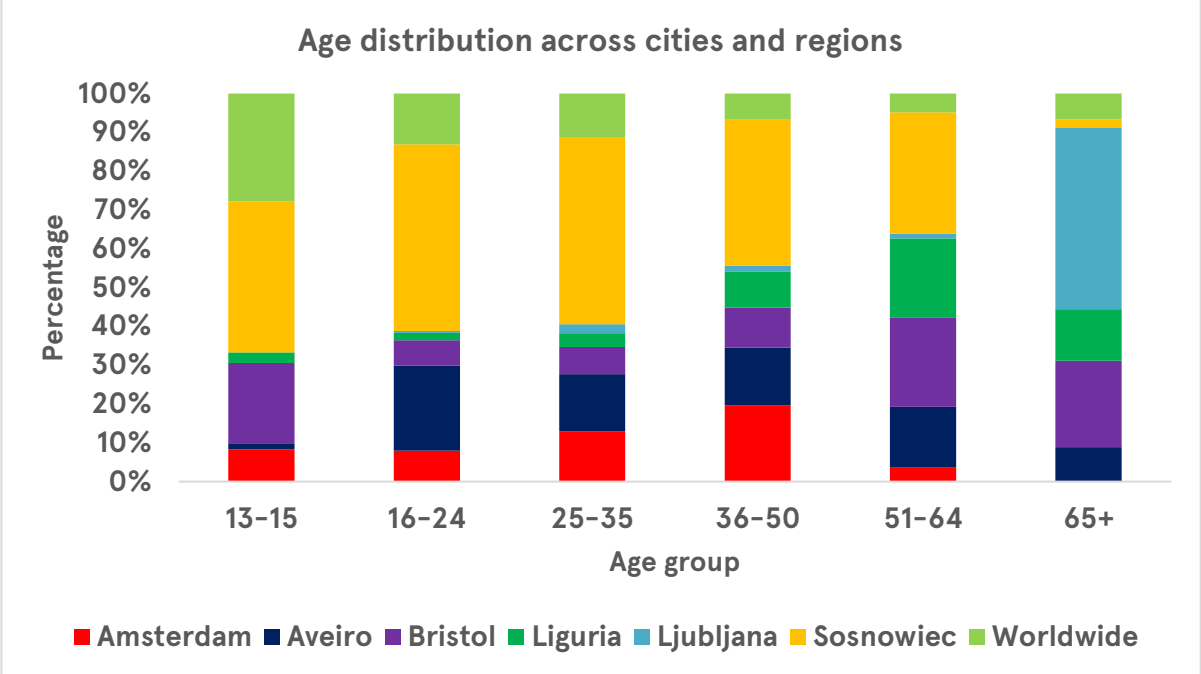

Figure 12: Spread of evaluation participant ages across the cities and regions

7.2.3. Expertise and Education levels

Participants in the Delphi, Policy and Stakeholder workshop evaluations (N=209) were asked their education level. Workshop participants were overall very highly educated, with 81% holding a Bachelor's or Postgraduate degree, as seen in Figure 13.

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Participants in the Game (N=560) were asked their self-rated expertise about air quality; conversely only 21% rated themselves as being well informed or having expert knowledge. The mean expertise value was in fact 1.6 out of 5 (*SD*=1.8), indicating that game evaluators felt they had little prior knowledge about air pollution, carbon emissions or health consequences.

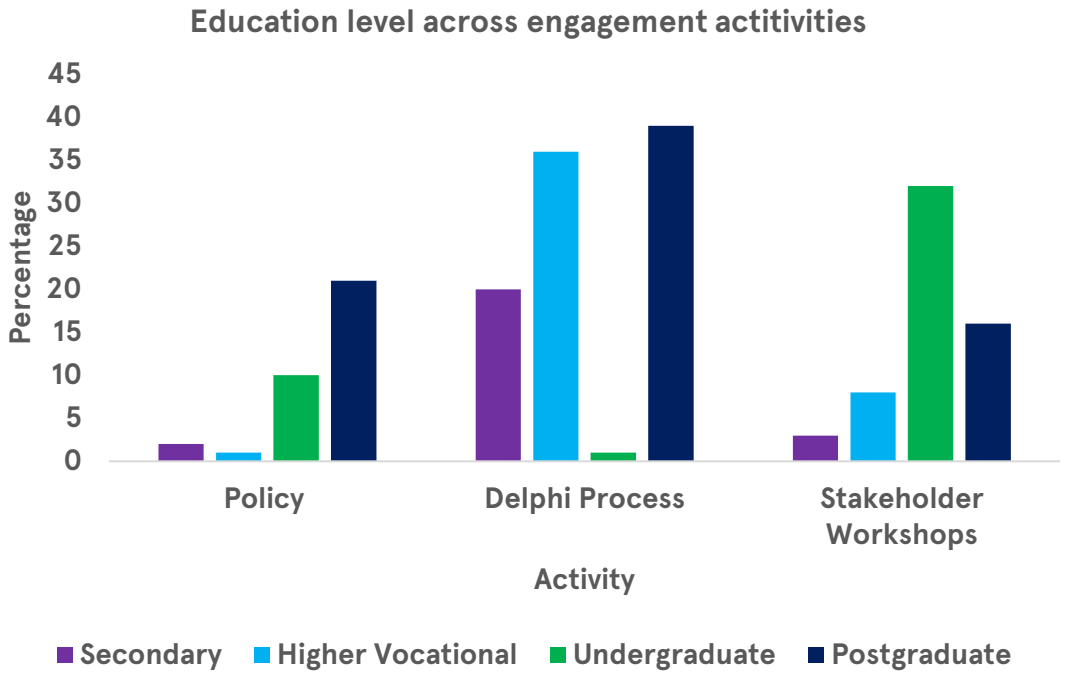

Figure 13 Education level across engagement activities

The cities varied in the expertise and education level of the participants they recruited to participate in the activities. A Kruskall-Wallis test showed that there were highly statistically significant differences at the p<.05 level between the expertise levels of participants in the cities [H(6)= 35.6, p<.000] and education levels [H(3)= 9.50, p=.023]. Bristol and Sosnowiec recruited the highest proportion of their participants with no knowledge or little knowledge of air pollution. Figure 14 shows that Amsterdam recruited proportionally more people from a postgraduate background than other cities, and Sosnowiec recruited proportionally more people with solely secondary education.

A greater proportion of female participants held a postgraduate degree, although more men held a Bachelor's degree. A Kruskall-Wallis test showed that this trend was not statistically significant at the p<.05 level [H(3) = 5.97, p=.113].

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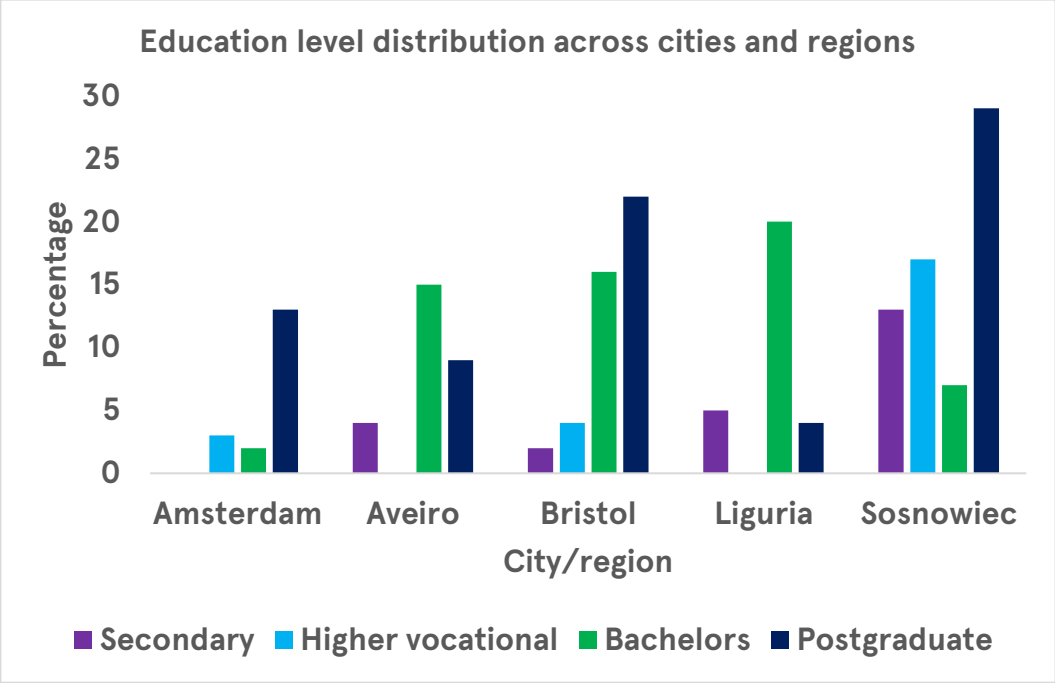

Figure 14: Education level across cities and regions

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7.3. Social media and online overview

To generate citizen led solutions to carbon emissions and air pollution, the use of social media and online information was important for ClairCity. Appropriately selected social media platforms allowed interaction and awareness raising with citizens in each of our six areas, as well as sharing findings and information about the project with a wider global audience. Over the lifetime of the project, ClairCity made successful use of a range of social media and online platforms to advertise our events and online tools, share information and raise awareness about air quality and carbon emissions, publicise relevant actions in each of our six areas and celebrate our success in media coverage or project findings.

Platforms were selected to enable us to communicate with the general public, academics, policy makers and organisations. Working across six areas in six languages, there were differences in channels selected to ensure each local audience was catered for, as well as engaging broader international awareness. Guidance for which platforms to use for each city or region was shared internally in April 2017, within the ClairCity Engagement: Social Media Guidelines document (included as an appendix within D2.1 ClairCity Communications Plan - "ClairCity citizen engagement: Social media guidelines." April 2017) to help local partners determine their platform choices. The primary determinants were the popularity of the platform in each country, the convenience of the platform for our content (e.g. we had more written than visual content) and the level of confidence each local team felt in using different platforms, with support from WP2. Over the lifetime of the project, we established the following social media for each area.

Table 7: Social media statistics for all cities

	Liguria	Bristol	Aveiro	Sosnowiec	Amsterdam	Ljubljana
Twitter	108 followers	1,281 followers	N/A	N/A	N/A	N/A
Instagram	203 followers, 29 posts	N/A	N/A	N/A	N/A	N/A
Facebook	314 likes, 329 followers	335 likes, 381 followers	423 likes, 428 followers	188 likes, 193 followers	84 likes, 87 followers	N/A
YouTube	7 videos, 1,555 views	25 Bristol videos, 730 views	5 videos, 2,822 views	3 videos, 405 views	9 videos, 260 views	2 videos, 29 views
Website	33,678 visitors					

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7.3.1. Project website

The project website was launched in August 2016, using WordPress to host on www.claircity.eu. The website was designed to host content for all six partner cities and regions in the six project languages, as well as further content in English aimed at academic and policy audiences.

Content was kept up to date to share events in each area in their local language, record noteworthy media coverage, and publish blog posts. Posts referred to our project activities such as international conferences or particular success stories in each city, and to provide background information or enhanced detail on information around air quality and carbon emissions, to help the general public understand data presented to them, or navigate media coverage on air pollution and climate change.

Table 8: Visitors and views of website per year

Year	Number of visitors recorded by WordPress	Number of page views recorded by WordPress
2016	383	2,158
2017	6,823	29,814
2018	12,666	35,370
2019	12,915	33,905
2020 (to Feb 10th)	891	2,247
Total	*33,678*	*103,494*

Although we can present these guideline figures on number of visitors, from the data available via the website host it is not possible to confirm a precise total number of individual visitors over the lifetime of the project. WordPress calculates its statistics by adding together the monthly unique visitors, so if a person visits the site in two different calendar months or years, they are counted twice. However, although this double counting may inflate the final total somewhat, it is still a useful statistic to judge interest in the project. All other WordPress site reports use the same metric, so it is still comparable to other projects or websites. Furthermore, if individuals are engaged by the site enough to want to return to it over a longer time period than a month, this indicates the information provided is of significant interest.

The number of "views" indicates how many pages of the website were viewed in total. This gives a mean average number of pages viewed per visitor as around three pages, although in practice there is wide variation in the number of pages an individual tends to browse through on a website per visit. This data excludes visits by website administrators, so project

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partner viewing of the website by individuals who were not administrators will be included, it is not biased by visits to update the website content.

The most popular years for the site were 2018 and 2019 because this was the time that the project was most active with multiple activities ongoing, directing citizens to look at the website. However, two of the top five months in terms of views were at the end of 2017, as the project started to produce dissemination materials. Typically summer figures are lower, as people are on holiday and less likely to engage on 'serious' topics or be researching for study or work, and the project avoided launching activities or tools in summer months.

Table 9: Views of website per month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016										560	921	657
2017	1232	1773	2093	1604	2666	2820	1805	2100	2036	4706	4123	2856
2018	3420	3045	3165	4182	3572	2495	2016	1686	2289	5084	2941	1475
2019	4016	4862	3567	3482	2953	2823	2618	2215	1775	2507	2022	1065
2020	1503	2085	1473									

Location of website visitors

Wordpress collects statistics on the visitor locations derived from IP addresses. This can give a general impression of where project interest was highest, and can help to determine whether our project audiences – in particular, EU citizens and people located in the countries that were partners on the project – can be considered. It is not possible to access further demographic data on website visitors, so more detailed analysis of e.g. gender or age is not available.

Overall, the nationalities of all six of our partner cities and regions were included in the top ten most popular locations which indicates our target audiences were reached. Other locations in the top ten were also within the EU (Spain, Belgium) and the USA.
The UK received a higher number of hits. This may be because there was more content available in English on the site. All of the key project pages were translated into partner city and region languages, but there was additional blog content in English, which could be the rationale behind this variation.

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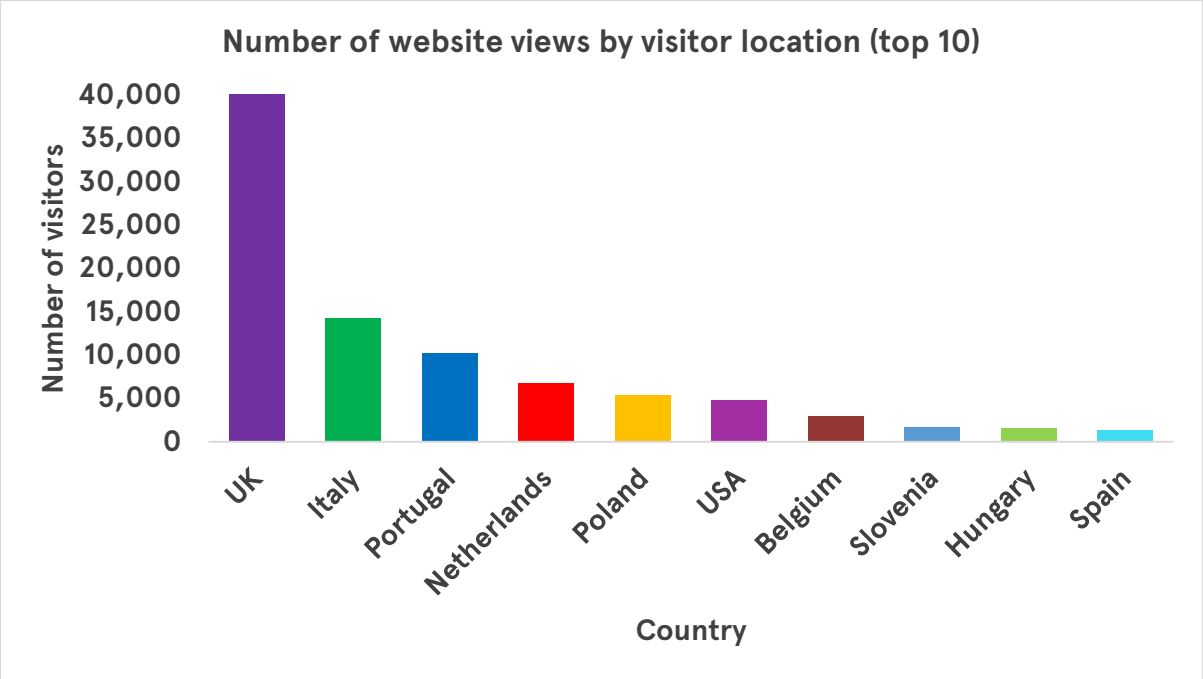

Figure 15: Number of website views by visitor location (top 10 locations)

Note: Due to the availability of statistics from Wordpress, this data shows the location per view, not per visitor. For example, a person located in the UK who looked at five pages on the website while browsing will count as five views in this data.

7.3.2. Facebook

Social media platform use varied across project regions, reflecting the audience and local team capacity. In some areas, social media use was a smaller part of the communications plan because local teams had alternative channels to engage with citizens and local agencies which gave a more valuable return on investment of time and project resources. In other regions or cities, social media played an important role in reaching a wider audience. While Facebook is ubiquitous across Europe, the decision on whether to host a dedicated project page was taken carefully for each location. It takes time to build up an audience for a page, and the general public in different locations may be more or less accustomed to engaging with 'official' pages (e.g. local authorities or research institutions) rather than media outlets or other sources of information. As a consequence, it was decided that five of the six cities and regions would set up a "ClairCity" page to present information in their local language, with the exception of Ljubljana.

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Table 10: Facebook page statistics overview

	Liguria	Bristol	Aveiro	Sosnowiec	Amsterdam	Ljubljana
Number of page "Likes"	314	335	423	188	84	N/A
Number of page "Followers"	329	381	428	193	87	N/A
Typical post audience	3,000 – 12,000	500 – 2,500	150 – 4,500	N/A	N/A	N/A

There was variation in how each page succeeded, depending on the metrics used. While Aveiro achieved the highest number of followers and page likes, most posts from the Liguria page reached a bigger audience. These differences reflected different techniques and approaches by local teams, as well as the size of the target population, national habits in Facebook usage and the priority that each local team gave to social media among other tasks. For some ClairCity areas such as Liguria, Facebook was a key platform. For others, such as Sosnowiec, access to more local authority offices, events and public spaces (e.g. billboards, digital screens) meant that Facebook, while useful, did not need to be a priority for project time and budget.

Overview of Facebook content

Across Europe, Facebook is less used as a tool for professional communication and more an opportunity to share with family and friends. Therefore, the ClairCity content across all five project pages focused on shareable graphics that would be accessible to a general audience, information about local project events or relevant local and international news on air quality and carbon emissions.

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Figure 16: Example of local news story shared from Sosnowiec page

As generally found on social media, video or graphical content resulted in higher views and wider reach. For example, sharing our ClairCity animation garnered larger audiences than posts with only text. The following example shows a highly performing post from the Liguria page.

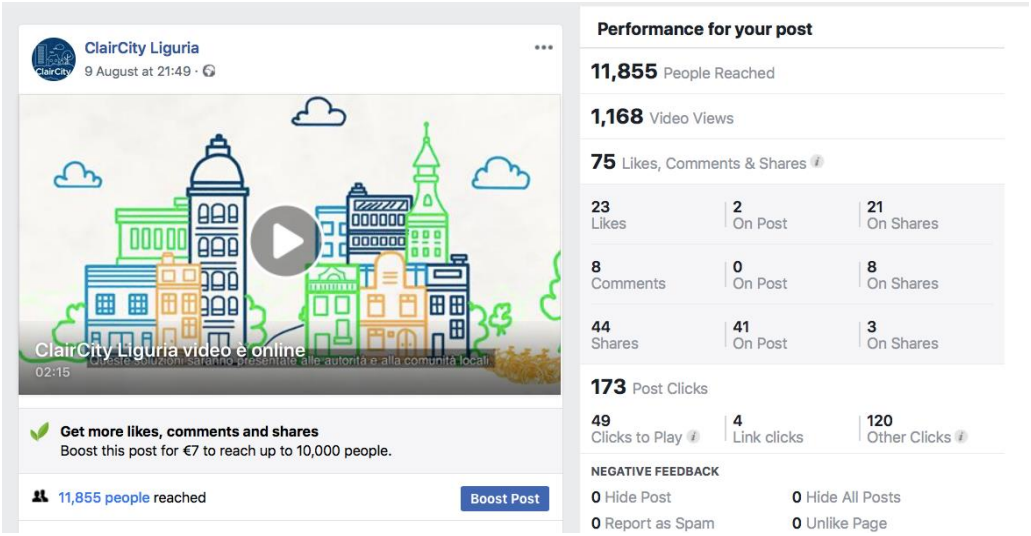

Figure 17: Example of post sharing (ClairCity animation) from Liguria page

Facebook does not provide access to total audience figures for posts over the lifetime of the project, but it does provide breakdowns by demographic data which can demonstrate our audience profile for different pages. The following sections provide an overview of each city or region's use of Facebook, with more detailed demographic data on the higher ranked pages.

Liguria Facebook data

Our Facebook page with the most reach was the Italian language page "ClairCity Liguria" www.facebook.com/ClairCityLigure/ focused on the Liguria region. Due to the local makeup

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of our team, social media was a strong channel to communicate with local audiences as the Liguria local authority covers the region around and including the city of Genoa but is separate from Genoa City Hall. Our Italian partner Techne Consulting could promote information to local audiences via social media even though team members were based across Italy.

The ClairCity Liguria page received 314 likes and 329 followers over the lifetime of the project, but through careful promotion, individual posts were able to reach a much larger audience. Many ClairCity Liguria posts reached over 3,000 people, with the most popular reaching over 12,000. These views were "organic" (i.e. not paid for through Facebook promotion). This was achieved by sharing posts in local city and neighbourhood news groups, where a much larger audience regularly see posts. For example, groups such as *"Genova… per me" and "Liguria Si Muove"* provided relevant local audience access.

Blue bar is post clicks, purple is reactions, comments and shares.

Figure 18: Regular Facebook postings with over 2,000 viewers (Liguria example)

Facebook provides a further dataset that can be useful to understand the ClairCity Liguria audience. We can see some demographic data about viewers, identifying their gender and age. This information comes from the data individuals post about themselves on their Facebook page. For our Liguria Facebook audience, there were slightly more men than women (56% to 44%) and for both genders the most popular ages were 35-64. This is slightly older than the typical international Facebook user profiles, as the average age of users is 25-34 (https://zephoria.com/top-15-valuable-facebook-statistics/). Overall, this demographic reach is in line with our project aims, where we expected social media platforms to connect us to adults of both genders, but not target the oldest or youngest.

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Figure 19: Facebook "people reached", gender and age (Liguria example)

Unfortunately, the demographic data provided per post by Facebook does not confirm the proportion of the viewers that were in the Liguria region, and therefore our prime audience. However, two indications make it likely that the majority of the audience reached were local to the Liguria region. We can assume that members of local and neighbourhood news groups either live, work or have a strong connection to Genoa and the surrounding Liguria region. The targeting of local news and neighbourhood groups was done to maintain an audience that would be relevant to the project and to the information being shared. Furthermore, while it is not possible to see the location of viewers for each individual post, Facebook analytics does allow insight into the locations of “Fans,” that is, people who have liked the ClairCity Liguria page. From this data, we can identify that the vast majority of people who liked the page were connecting to the internet in Genoa.

Country	Your Fans	City	Your Fans	Language
Italy	290	Genova, Liguria, Italy	232	Italian
Portugal	3	Rome, Lazio, Italy	11	English (US)
Germany	2	Milan, Lombardia, Italy	5	English (UK)
Brazil	2	Turin, Piedmont, Italy	3	Spanish
Moldova	2	Albenga, Liguria, Italy	3	Polish
United Kingdom	2	Florence, Tuscany, Italy	3	Portuguese (I
Poland	2	Ribeirão Prêto, São Pa...	2	German
United States of America	2	Savona, Liguria, Italy	2	Russian

Figure 20: Location of Facebook "fans" (Liguria example)

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Aveiro Facebook data

The ClairCity Região de Aveiro page www.facebook.com/ClairCityRegiaoAveiro/ posted mostly in Portuguese with occasional comments in English, sharing a mix of locally relevant news and project updates.

The Aveiro page had the highest number of followers and page likes from all of our Facebook pages, with over 400 of each. However, for individual posts it tended to have a smaller audience than Liguria or Bristol. Most posts reached between 150 – 4,500 people, with the most popular post reaching almost 5,000 people related to the launch of the ClairCity Skylines game. Aveiro posts tended to be shared less often than in Liguria, and the local team were not able to make as much use of local groups.

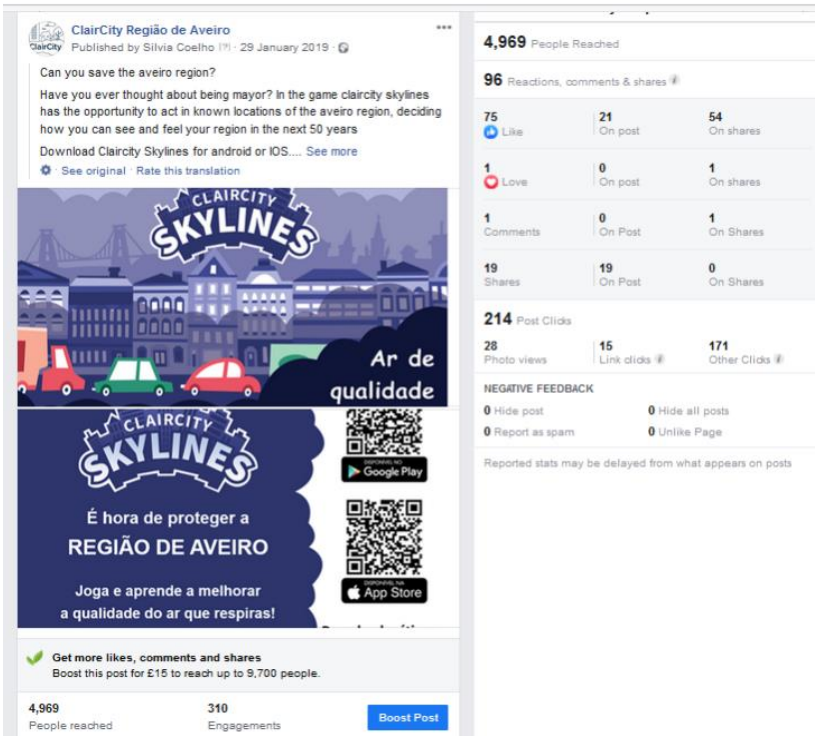

Figure 21: Most viewed Facebook post (Aveiro example)

Unlike Liguria, the Portuguese audience was predominantly female (70%) and spread across the middle age ranges from 18 – 54 years old.

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Figure 22: Facebook "people reached" age and gender (Aveiro example)

Through Facebook analytics on those who followed the Aveiro Region page, it is possible to identify that the majority lived within the target area, and thus the page was reaching its intended audience. The largest grouping is from Aveiro city, but other Aveiro Region municipalities such as Estarreja, Vagos and Ovar also feature in the top ten locations, alongside larger Portuguese cities such as Lisbon and Porto.

Country	Your Fans	City	Your Fans
Portugal	383	Aveiro, Aveiro District, ...	151
Brazil	14	Lisbon, Lisbon District...	24
France	4	Porto, Porto District, P...	17
Angola	3	Gafanha da Nazaré, Av...	16
Cape Verde	3	Estarreja, Aveiro Distri...	14
United Kingdom	3	Leiria, Leiria District, P...	11
Germany	2	Vila Nova de Gaia, Port...	8
Italy	2	Manaus, Amazonas, B...	8
Spain	2	Ovar, Aveiro District, Po...	8
Norway	1	Vagos	7

Figure 23: Location of Facebook "fans" (Aveiro example)

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Bristol Facebook data

Our English language “ClairCity” page www.facebook.com/ClairCity functioned primarily as a focus on Bristol information as well as also offering an English speaking entry point for a broader audience interested in the project.

By Spring 2020 the page had over 380 followers, with a larger audience reached by individual posts. The reach of posts from the Bristol ClairCity page tended to be between 200 and 2,000 Facebook users. The most popular individual post reached over 2,600 people. It was published in August 2018, once the project had already built up some following and name recognition in partner cities. It included the animation video produced for the project, which is in line with general advice on social media posting suggesting that posts with graphics tend to get more interaction.

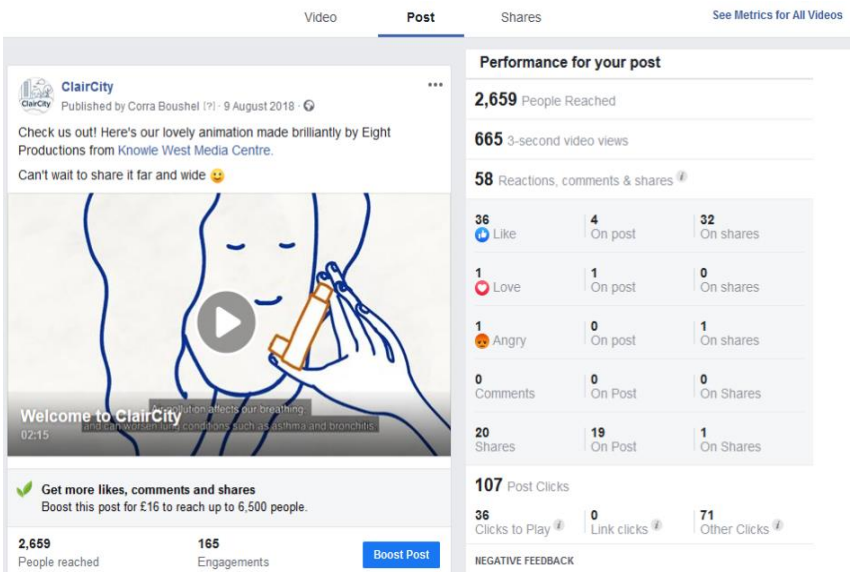

Figure 24: Most popular Facebook post (Bristol example)

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Figure 25: Facebook "People reached" gender and age (Bristol example)

As with Aveiro, the audience for Bristol posts was more female than male, but broadly in the central age categories. The local team experimented with “boosted” (i.e. paid for) posts to promote the launch of ClairCity Skylines. We promoted two posts that differentiated links to the game targeted at iPhone and Android users respectively (see link to post https://www.facebook.com/watch/?v=541348356260443). The initial results from this paid-for content was not as strong as interest generated by engaging with local media and going to events, so further paid-for content was not used.

When examining the data on who chose to follow or like the page, the analytics indicate that the central target audience for the page was achieved. Just under third of the audience were living in Bristol, UK. Our other partner cities and regions were next, with Portugal in particular showing a strong interest.

Country	Your followers	City	Your followers
United Kingdom	131	Bristol, England	101
Portugal	84	Aveiro, Aveiro District, ...	37
Italy	35	Genova, Liguria, Italy	21
Poland	31	Sosnowiec, Silesian Vo...	15
Belgium	12	Lisbon, Lisbon District,...	12
Spain	12	Amsterdam, Noord-Holl...	7
Netherlands	12	Porto, Porto District, P...	5
Germany	6	Dabrowa Gornicza, Sile...	5
Greece	4	London, England	4
Norway	3	Warsaw, Masovian Voiv...	4

Figure 26: Location of Facebook page followers (Bristol example)

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As the only ClairCity page posting uniquely in English, it was unsurprising that this page had a broader interest and following than only the local city target audience. Nevertheless, interactions on posts that focused on Bristol topics demonstrated a keen local interest in data the project was able to share and explain.

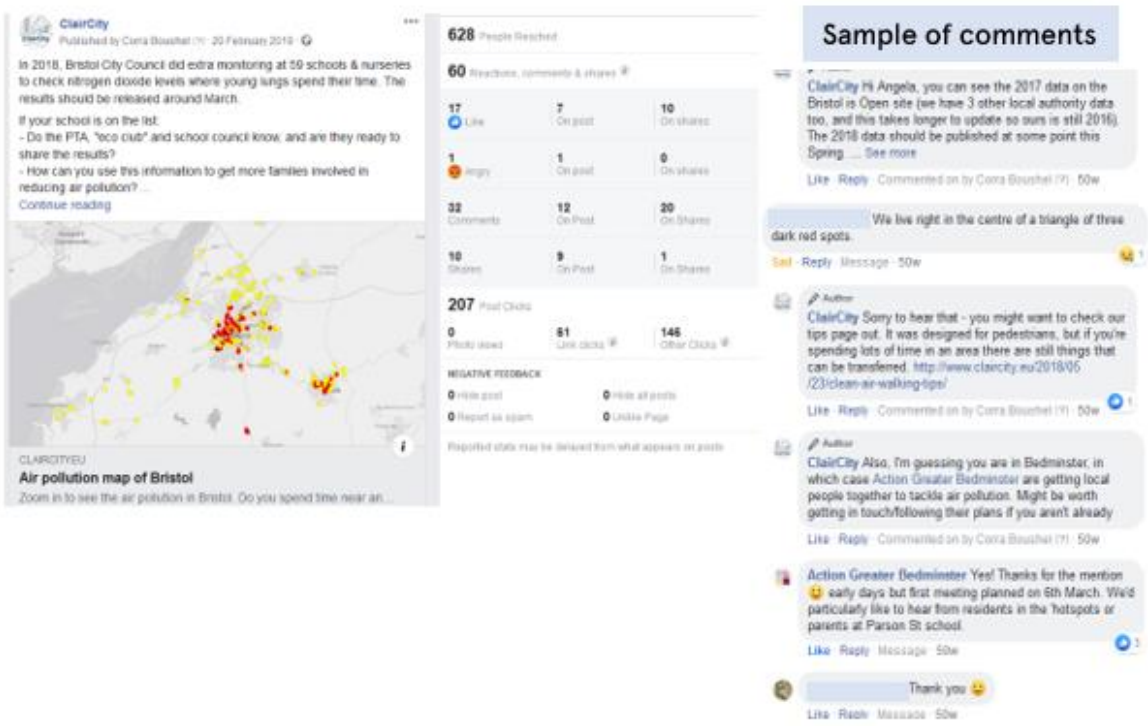

Figure 27: Example of interactions on Facebook (Bristol example)

Sosnowiec Facebook data

Our Polish language page www.facebook.com/ClairCitySosnowiec had nearly 200 followers by Spring 2020. Social media is a useful platform for Polish audiences, but as our target was a specific geographical area where the project had strong access via the city authority, social media was a less important route to contacting and involving citizens than using billboard advertising, events and local networks.

Amsterdam Facebook data

The Amsterdam Facebook page www.facebook.com/ClairCityAms had just under 100 followers by the end of the project. Despite Amsterdam having a larger population than some other project areas, it had fewer followers for the Facebook page. This was due to social media playing a less important role in communicating with local people for the Amsterdam team. The Amsterdam city authority used their own contacts for registered citizens and interest groups, which were used to share information and generate interest in project activities.

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Ljubljana promotions

In Ljubljana, the local authority already hosted an active Facebook page with significant local following, and Ljubljana City Hall partners were happy to use the channel to share project information. This enabled them to share information with their existing audience, rather than having to build up a new audience specifically for the project. It was not felt necessary to provide a separate ClairCity page which would duplicate this effort, so no ClairCity Ljubljana page was established. Posts promoting the ClairCity Skylines game were shared via the Ljubljana City Hall page.

7.3.3. Twitter

In recognition of its use for professional audiences, media and networking with organisations, two Twitter accounts were set up by ClairCity. One was English language, @ClairCity which combined some information relevant to Bristol audiences with information aimed at a broader international professional network of air quality campaigns, researchers and government or policy organisations. The second account @ClairCityLigure was Italian language and focused on promoting ClairCity events and academic outputs to an Italian professional public.

The aims of the Twitter accounts differed from Facebook, and the content was altered accordingly. More emphasis was placed on academic outputs, professional networks and raising the profile of the project with other organisations.

English language professional audience on Twitter

By February 2020, the @ClairCity Twitter account had over 1,200 followers. Between May 2016 and Spring 2020, the @ClairCity output received over 770,000 impressions. Individual tweets reached up to nearly 14,000 impressions, with a typical tweet reaching 500 – 2,000 individuals.

Unfortunately, as of January 2020 Twitter is no longer allowing audience analytics through the platform, so we cannot provide demographic information on our followers. Our observations of those who engaged with the project via Twitter indicate that the audience was a combination of an international professional audience interested in air quality, including academics, policy and political organisations from across Europe.

Twitter use in the UK is relatively common, with over 14 million active users (https://blog.hootsuite.com/twitter-statistics/) so some locally focused Bristol content was also included, but as expected the interactions tended to be with local residents who already had a professional interest or higher degree of knowledge about air quality issues. The local audience included a mix of individuals with a personal interest and local organisations, schools and professional groups. The following screenshots show examples of Twitter engagement and interactions with experts, local organisations and Bristol-relevant topics.

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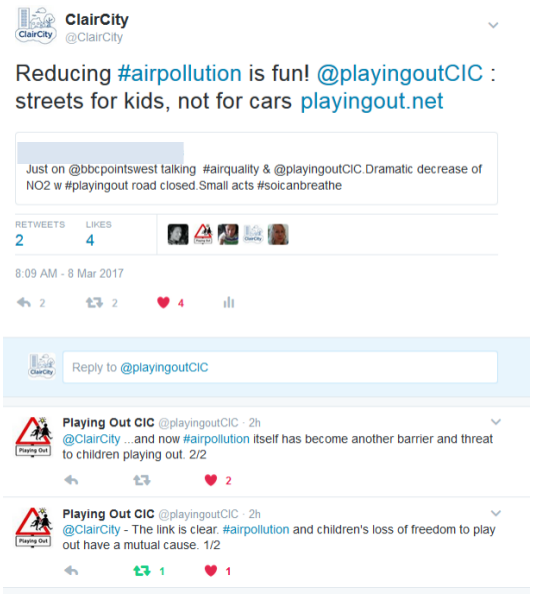

Figure 28: Twitter engagement with stakeholders (Bristol-based example, 03/17)

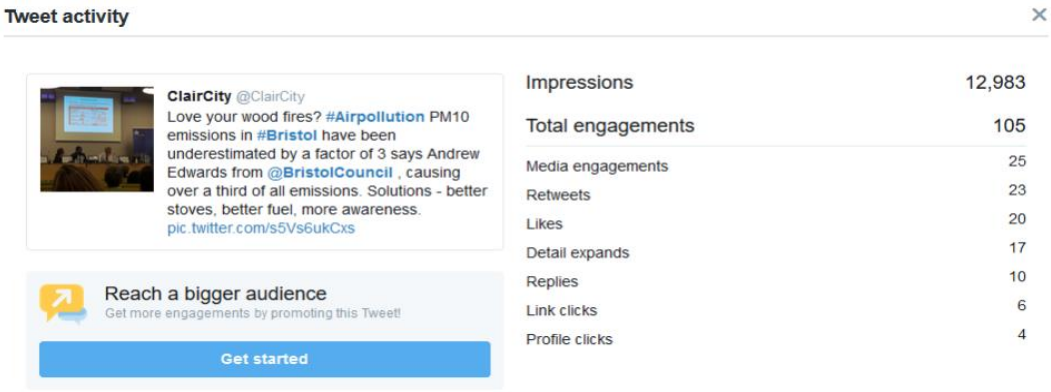

Figure 29: Twitter high impression rate example (Bristol, April 2018)

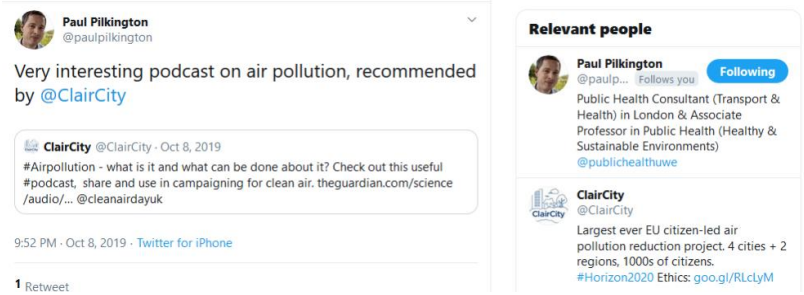

Figure 30: Twitter engagement from public health expert, UK

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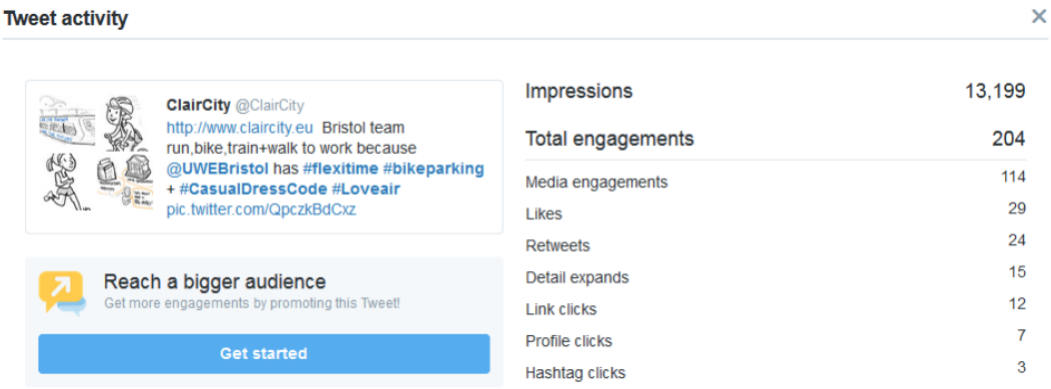

Figure 31: Participation in global UN air quality Twitter initiative #LoveAir (11/16)

Italian professional audiences on Twitter

The Italian language Twitter account @ClairCityLigure collected over 105 followers throughout the project. It shared information on project dissemination and project activities. The Italian Twitter account was not the primary mode of communication with citizens from Liguria, as it focused more on academic outputs.

As with the @ClairCity account, analytics on followers are not easily available. Academic researchers, research projects, local politicians and some Ligurian business, community groups and individuals followed this account.

Figure 32: Example of @ClairCityLiguria tweet

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7.3.4. Instagram

For all ClairCity target areas except Liguria, local teams decided not to run an Instagram account. While Instagram can be a valuable tool for reaching a broad public audience and has a slightly younger average user age than Facebook, it had two drawbacks. Firstly, it relies on a quantity and quality of visual content that can be hard to generate in research projects until later on in the development of events, data and statistics. Secondly, while it is becoming more popular, it is still a smaller potential reach than Facebook across Europe, so with limited time it is potentially less useful than using Facebook unless specific audiences that might be more frequently found on Instagram are of particular interest to a project.

Figure 33: Most popular post on ClairCity Liguria's Instagram

Liguria Instagram data

The local team in Liguria experimented with Instagram www.instagram.com/claircityliguria as a way to reach more local people in the Liguria region. As they had less local presence through the local regional authority and Italian project partner, they had more capacity to use social media platforms more broadly.

Over the lifetime of the project they gained over 200 followers and posted captioned 29 images. Most of the images were timed to promote specific local project activities, e.g. film competition and Delphi surveys. More than half of the images received over 80 "likes," with the most popular receiving 140 likes.

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7.3.5. YouTube

Within ClairCity we used YouTube channels and playlists to manage the Video Competition assets, provide an easily accessible online storage location for the ClairCity animations and share recordings from conferences or media reports.
By the end of the project, the project hosted four YouTube channels and content in all six local project languages.

Table 11: Details of YouTube channels across cities and regions

	Liguria	Bristol	Aveiro	Sosnowiec	Amsterdam	Ljubljana
YouTube	Own channel	Own channel	Own channel	No channel	Own channel	No channel
Content	7 videos	25 Bristol-content videos, 34 in total	5 videos	3 videos posted to main site	9 videos posted to main site	2 videos posted to main site
Views	1,555 views	730 views	2,822 views	405 views	260 views	29 views
Channel link	Liguria	Bristol	Aveiro	Available on playlist: Sosnowiec	Available on playlist: Amsterdam	Available on playlist: Ljubljana

Video competition management

The use of the YouTube channels varied primarily on how each local team organised its Video Competition element. In Bristol, where videos were made in collaboration with local organisations, there was little "competition" element. Each video was shared with the collaborating organisation who could then make use of it for their own promotional purposes within the community. As a consequence, while Bristol generated the most videos in terms of numbers (25), the total views were around 730. Furthermore, an interview as part of the competition (Julie) was uploaded as multiple separate videos rather than edited together, generating more videos but each one is shorter.
In contrast, Aveiro Region worked with their multiple municipalities to engage in a competition where entrants were encouraged to get more views, resulting in fewer videos (5) but over 2,800 views. In both Aveiro and Bristol, videos were collated by the project team and published under their local video channel. In Sosnowiec, local entrants to the Video Competition were encouraged to upload their own content so that the local authority did not have any legal responsibilities over content management. In Ljubljana, the Video Competition was not highly engaged with by local audiences, so content was uploaded via

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the central channel so that the local team did not have to duplicate work to set up and manage a channel themselves.
A channel was generated by project staff to collate all of the Video Competition entrants from across the entire project for easy access.

ClairCity promotional animations and other content

YouTube provided an easily accessible location to store the ClairCity animations so that project partners could access them from any location, as well as being visible to members of the public. The animation was released with embedded subtitles in each of the six project languages. Two versions were uploaded for English speaking audiences, one with embedded English subtitles and one without. The combined number of views for the English language versions on YouTube is over 500. However, total number of views collated on YouTube does not represent the total number of viewers for the animations, as Facebook and Twitter counts are recorded within their platforms rather than via a link back to the YouTube content.

YouTube appearances

Beyond the content produced or collected by the project, project team members featured in videos generated by other providers.
These videos were shared within the ClairCity playlist where they provided interviews or presentations by project members directly describing ClairCity tasks. This includes videos generated by EASME as part of their #CommsWorkout webinar series, a presentation at a Science Communication event in Bristol, a presentation to an EU event in Poland, and a WHO video about health inequalities. The most widely reaching video of this sort is a piece by the Global Cycling Network, in which Prof. Enda Hayes was interviewed. This video has been watched over 101,000 times with significant interaction and positive feedback in the comments section.

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7.3.6. Summary of social media use

The experience of using Facebook, Instagram, YouTube and Twitter to promote local activities gave local partners an opportunity to compare their effectiveness. The time and energy spent on social media platforms by each local team was directly related to the impact and reach achieved. For some of our participating areas, existing networks and access to public bodies, locations and groups meant that social media was not a primary means of communication with their public, and as a result the lower numbers reached through social media was not problematic.
For the project context, Facebook was the most efficient in reaching larger audiences. As a clear example of the need to go beyond just posting resources and expecting them to gain interest organically, the difference in reach by posting in local Ligurian groups compared to just posting content (e.g. Aveiro or Bristol) is clear. Facebook also allowed for a more text-based message and did not require as many images to capture attention as Instagram. However, Instagram with a good stock of images garnered a reasonable number of interactions, and could have potential for future projects as the platform becomes more popular.

YouTube was highly practical to store videos as these require very large server storage space, and meant that videos were easily accessible for project staff. Promoting videos on YouTube is time consuming, but featuring in popular channels as a form of online media work has the potential to reach a very large and global audience.

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7.4. Delphi Process

7.4.1. Delphi participant characteristics

Here we present participants characteristics regarding those who engaged with the Delphi Process. A total of 4887 people were engaged across all three rounds and the analysis is presented below.

Table 12: Delphi Process engagement data across all cities

	Delphi		
	Total number of participants	Male/Female (%)	Most popular age range
Amsterdam	915	55/45	51-65 (43%)
Aveiro	1349	41/52	37-50 (35%)
Bristol	789	38/57	37-50 (31%)
Liguria	1127	40/59	51-65 (29%)
Ljubljana	275	39/59	37-50 (38%)
Sosnowiec	432	37/59	37-50 (26%)
Total	4887		

Overall the Delphi process participants were in the majority middle-aged (56.2% 37-65), white (91.0%), and well-educated (64.5% with a degree or higher qualification), with a slightly higher proportion of female respondents (55.6%) than male (Table 12). Other than respondents in the youngest age category being least likely to hold a degree (47.0% with a degree or higher in the 16-24 category compared to 80.5% across all other age categories), gender, age and education showed little co-variation.

The overall gender distribution was mostly consistent across the ClairCity cities/regions with the exception of Amsterdam, where there was a higher proportion of male participants (54.8%) (Figure 34). Those who identified with a non-binary gender were poorly represented overall, making up just 0.5% of respondents, with the highest proportion being from Bristol (1.5%), while no respondents from Ljubljana or Sosnowiec identified with a non-binary gender.

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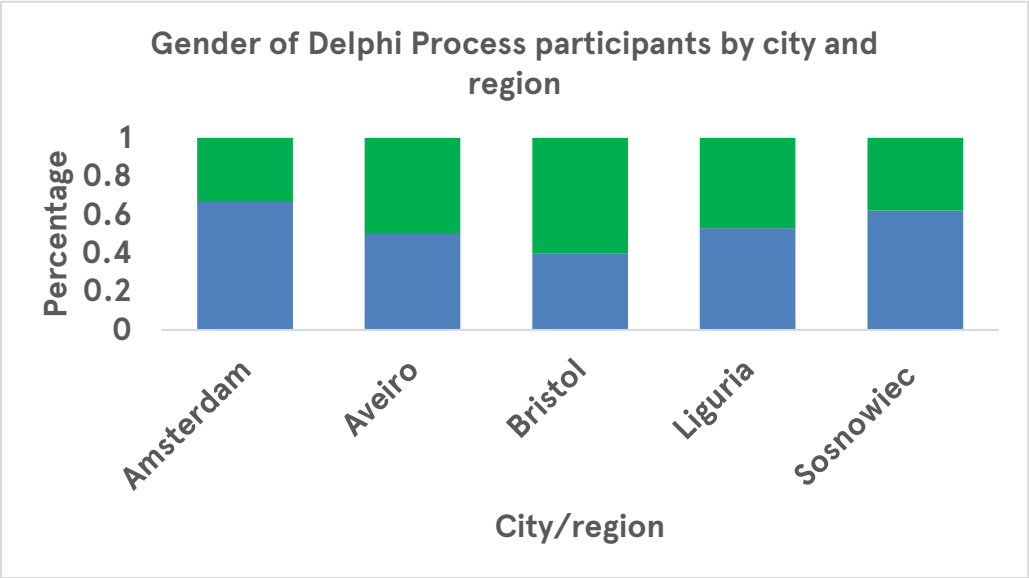

Figure 34: Gender of Delphi Process participants by city and region

In general, the age distributions across countries broadly matched the overall distribution, with the exception of respondents from Amsterdam, who were skewed much older than other cities/regions (69.7% over the age of 50). Most cities/regions had a considerable minority of respondents in the youngest age category (16-24), such as Amsterdam and Ljubljana, where only 1.9% and 4.6% of respondents were young people, respectively. At the other end of the age range, both Aveiro and Ljubljana had few older respondents (aged 65+), making up just 4.2% and 4.6%, respectively.

7.4.1. Participant feedback on the Delphi Workshops

Here we present the feedback given by those taking part in the Delphi Workshops. A total of 101 surveys was collected and its analysis is presented below, including the evaluation participant characteristics (Table 13).

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Table 13: Delphi Workshops evaluation data across all cities

	Delphi		
	Total number of feedback	Male/Female (%)	Most popular age group
Amsterdam	6	33/67	51-65 (67%)
Aveiro	12	50/50	16-24 (58%)
Bristol	36	58/39	51-65 (40%)
Liguria	17	47/53	51-65 (35%)
Ljubljana	2	0/100	51-65 (100%)
Sosnowiec	29	38/62	51-65 (28%) and 65+ (28%)
	102		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

Overall across all cities/regions (Figure 35), the Delphi process saw a fairly even gender distribution of participants (52% Female, 48% Male), with some variation between countries. Bristol had the highest proportion (60%) of male participants, while Amsterdam had the highest proportion of female participants (67%). Ljubljana was not included in the data analysis due to low attendance

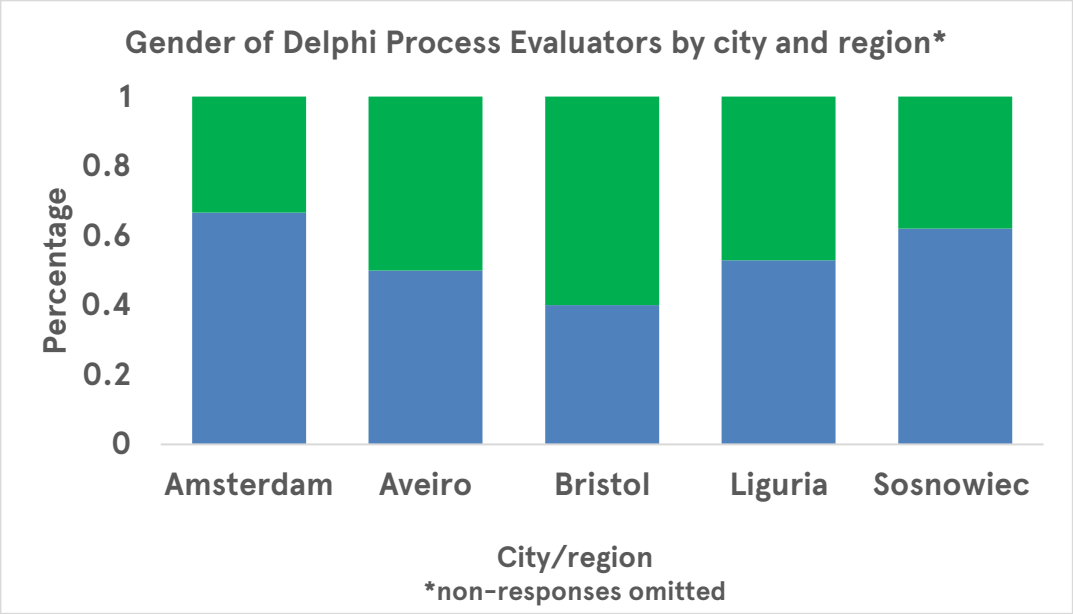

Figure 35: Gender of Delphi Process pariticpants by city and region

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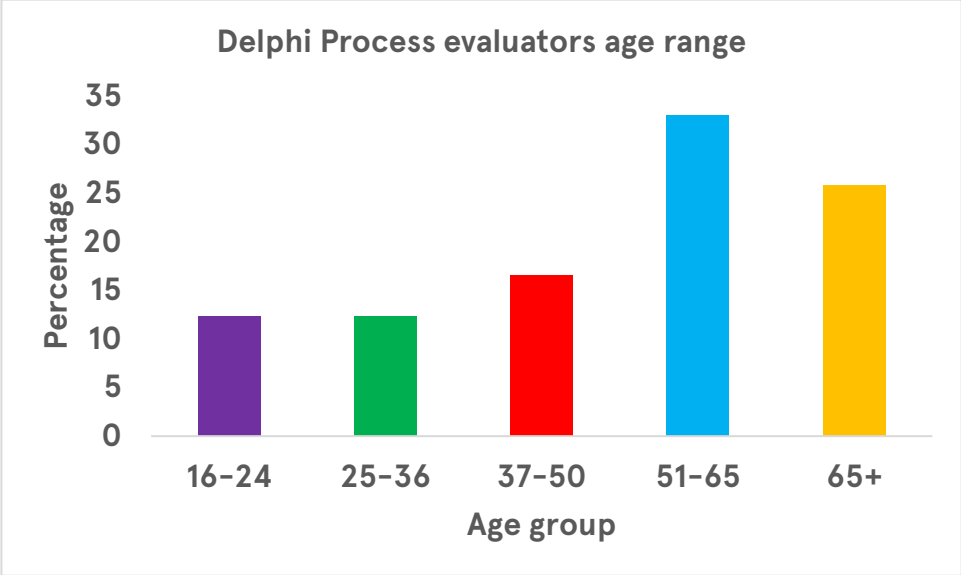

Figure 36: Age distribution of the Delphi Process Evaluators

The age distribution of evaluation participants (Figure 36) was skewed older, with 59% of participants being over the age of 50.

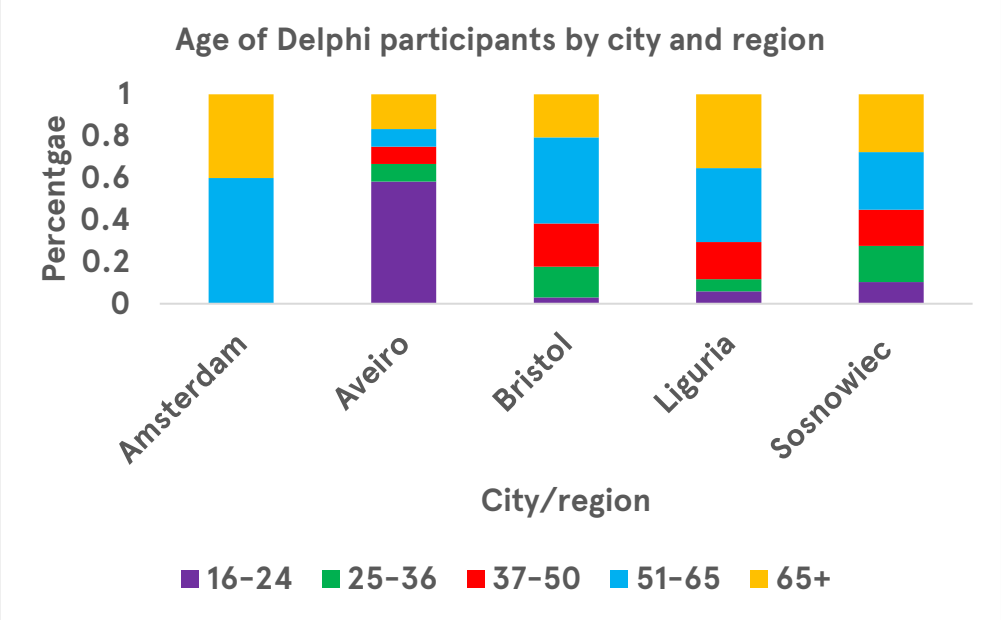

Figure 37: Age distribution of Delphi Process participants by city and region

Looking at the age distribution of Delphi Process Evaluators by city and region (Figure 37), it is most noticeable that in Amsterdam all of the evaluation respondents were over 50, whilst Aveiro in comparison had much younger participants, with 58% of participants being in the 16-24 age category. Sosnowiec, Liguria, and Bristol had broadly similar age distributions of

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participants, with the majority of participants being over the age of 50, but with representation from each age category.

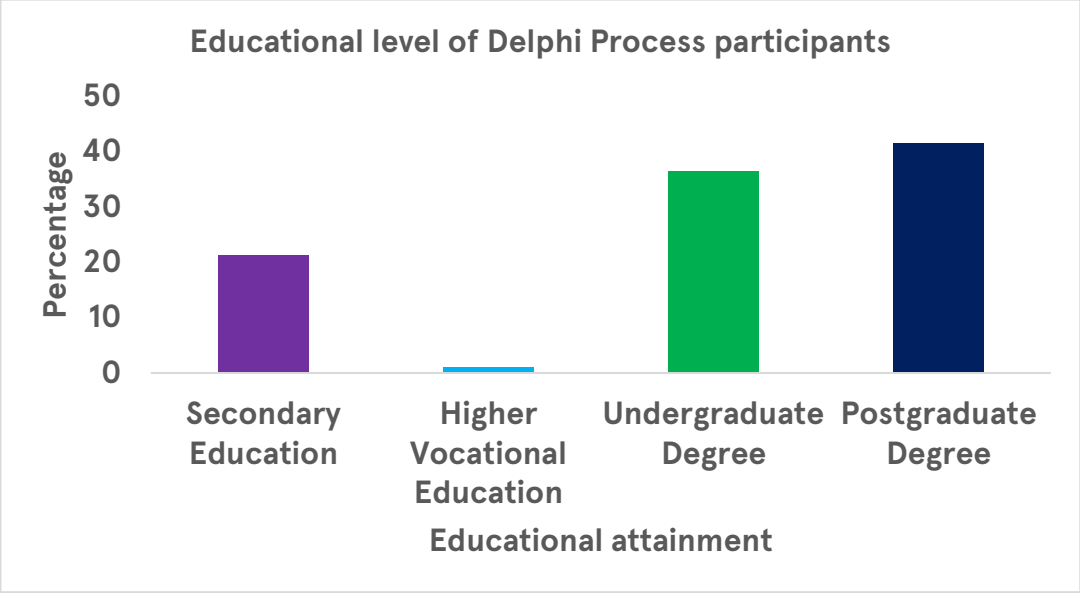

Figure 38: Education level of Delphi Process participants

Overall, the Delphi process participants were relatively highly educated, with 77% holding at least an undergraduate degree.

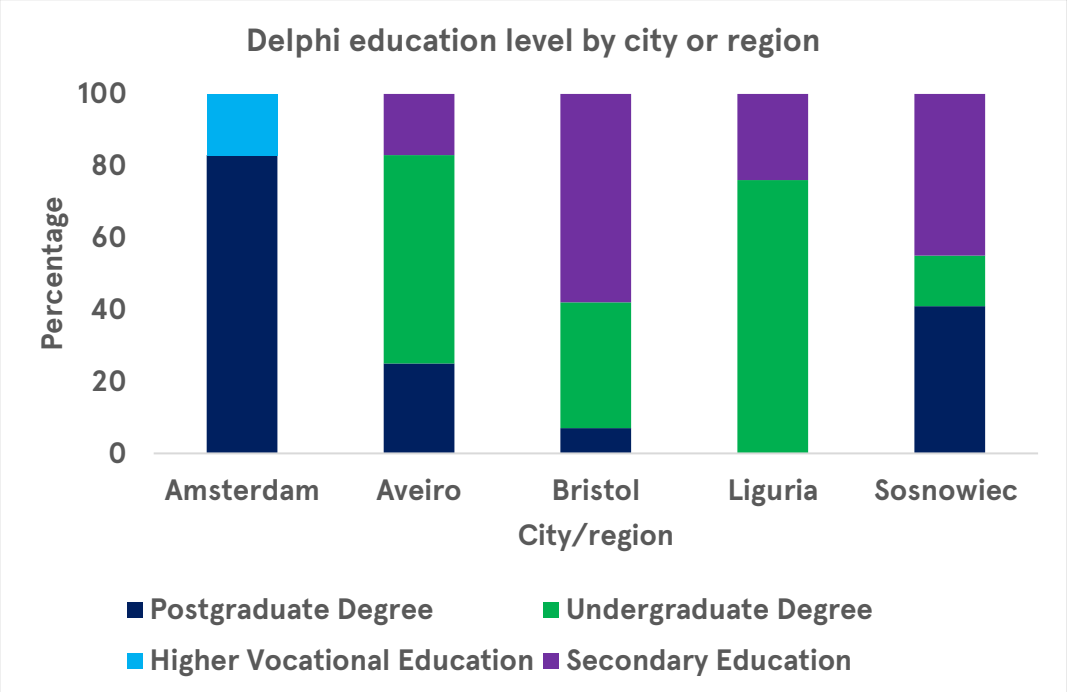

Figure 39: Education level of Delphi Process participants by city and region

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Breaking participants' education level down by city, it can be seen that Amsterdam had overwhelmingly highly educated participants (83% holding a postgraduate degree). By comparison, the majority of respondents from Liguria had an undergraduate degree, but none had a postgraduate degree. Sosnowiec had the largest proportion (44%) of respondents whose highest level of education was secondary education, which was also the most popular education level in the city.

Overall, the Delphi process participants were skewed older and highly educated with the majority being over the age of 50 and having an undergraduate or postgraduate degree. However there was considerable variation between cities/regions:

- Amsterdam – More female, much older, and much more highly educated than the overall distribution, with the overwhelming majority holding postgraduate degrees.
- Aveiro – Much younger than the overall distribution of participants, with the majority being under the age of 25 and holding an undergraduate degree.
- Bristol – Skewed more male, older, and more highly educated than the overall distribution of participants, with the majority holding postgraduate degrees.
- Liguria – Proportionally skewed slightly older and having a lower education level than overall, with most participants holding an undergraduate degree.
- Sosnowiec – Proportionally more female and having a lower education level than overall, with many participants educated to secondary level.

7.4.2. Delphi process feedback

Overall the Delphi process participants really enjoyed the Delphi workshops. 92% of respondents said they enjoyed it or really enjoyed it, and no one said they did not enjoy it.

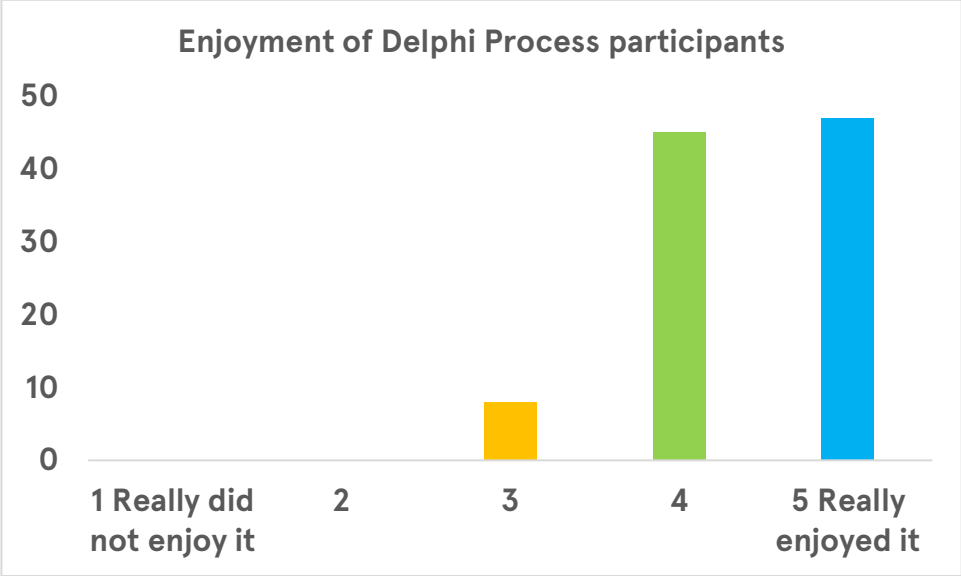

Figure 40: Enjoyment rating of Delphi Process participants

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The overwhelming majority (90%) of participants felt that their knowledge increased after taking part in the Delphi process. Most of those (63% overall) felt they only learned a little, perhaps due to the high prior education level of participants meaning they were already well informed.

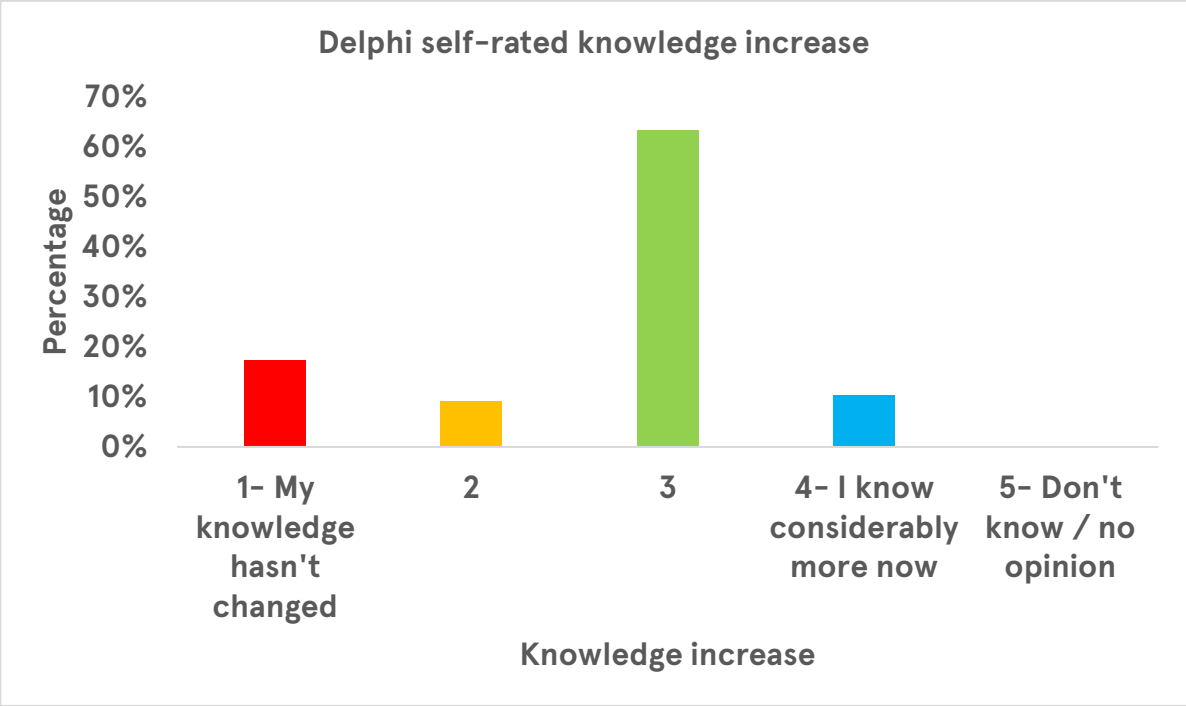

Figure 41: Self-rated knowledge increase of Delphi Process participants

Positive comments (21 comments)

As can be seen from the word cloud, Delphi process participants most often described the workshops as “interesting”. Participants also said the workshops were “meaningful”, “stimulating”, “well-organised”, “varied”, “surprising”, and “pleasant”. The productive discussion seems to have been one of the most valued aspects of the process, which offered “exchange of opinions”, where it was possible to “[think] in a group and [share] experiences in a non-judgemental way”. Some participants felt there was a “good range of stakeholders, interests and views”. Outcomes which participants explicitly mentioned included learning “a lot about the city” and thinking “more deeply about air pollution and how to solve it”.

Negative comments (8 comments)

Not everyone commented positively on the Delphi process. Some negative comments focused on the content of the workshops, which “could have been explained more clearly”, and was “a little bit theoretical”, or too long, and hence “boring”. Other participants mentioned the balance or representativeness of the participants. For example, one participant felt their group was “probably not fully representative of drivers” and that they had

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a high degree of consensus between them. Another participant thought that their group found the policy impacts “easy”, meaning the discussion was “sterile”. Some participants questioned the process altogether, questioning how seriously the responses could be taken “for such a short workshop”, or “how much the project will learn from workshops like this”.

Suggestions

Some participants (n=7) made suggestions to improve the Delphi process. Most of these related to specific changes to the workshops such as being able to see the workshop materials in advance, and having introductions at the beginning of the workshops so participants can get to know each other. Some participants wanted the workshops to be longer to allow for more in depth discussion, while one participant instead suggested simplifying the discussion topics. One participant made the specific recommendation of using the Nuffield “ladder of interventions”. Other participants suggested expanding the workshops to include more or different kinds of people such as mayors, city halls, and schools. This indicates that the role of the workshop within the wider Delphi and ClairCity context was not fully appreciated and perhaps could have been better explained to participants.

Outcomes from engagement

The majority of Delphi process participants (58%) said they would do something in future. Of the 53 participants who expanded on what they would do, the following actions were given:

- Feeding into local action/lobbying/policy (n=10)
- Involving others/promoting/raising awareness (n=8) | Reducing car use (n=8)
- Walking more (n=7)
- Using public transport more (n=6) | Can’t do any more (n=6)
- Changing the type of fuel they use (n=5)
- Cycling more (n=4)
- Using an electric car (n=2) | Getting a less polluting car (n=2) | Research (n=2)
- Legal action (n=1) | Not having a car (n=1) | Re-thinking commuting (n=1) | Feeding into national action/lobbying/policy (n=1) | Avoiding unnecessary journeys (n=1) | Planting trees (n=1) | Reporting others who infringe regulations (n=1)

Of the eight participants (30%) who explained why they would not take action as a result of the Delphi process they mentioned:

- Already taking action (4)
- Mobility takes precedence over environmentally friendly lifestyle (1) | Can’t make change alone (1) | It’s the local authority’s responsibility (1) | Haven’t thought about it yet (1)

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7.4.3. Differences between cities, ages, and education level

Participants in Aveiro were overwhelmingly positive about the Delphi Process, whilst those in Bristol and Amsterdam, while still positive in the majority, were more likely to be ambivalent. Looking at the enjoyment ratings by age and education level, it appears that those who were older and more highly educated were most likely to feel ambivalent towards the workshops. Indeed, A Spearman correlation coefficient was computed to assess the relationship between participants' age and their enjoyment of the activities. There was a negative correlation between the two variables (rs(97) = -.311, p=.002) i.e. the younger the participants, the more likely they were to say that they enjoyed the activity.
This indicates that perhaps the differences in enjoyment seen between cities is due to the different demographic profiles of the participants in each city/region.

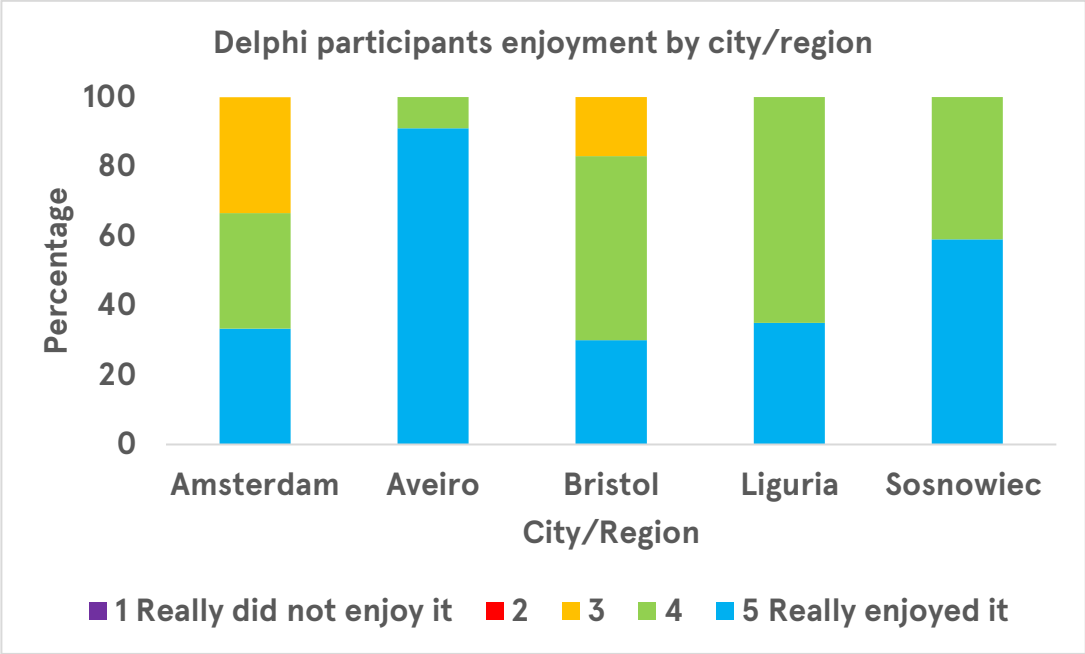

Figure 42: Enjoyment of Delphi Process participants by city and region

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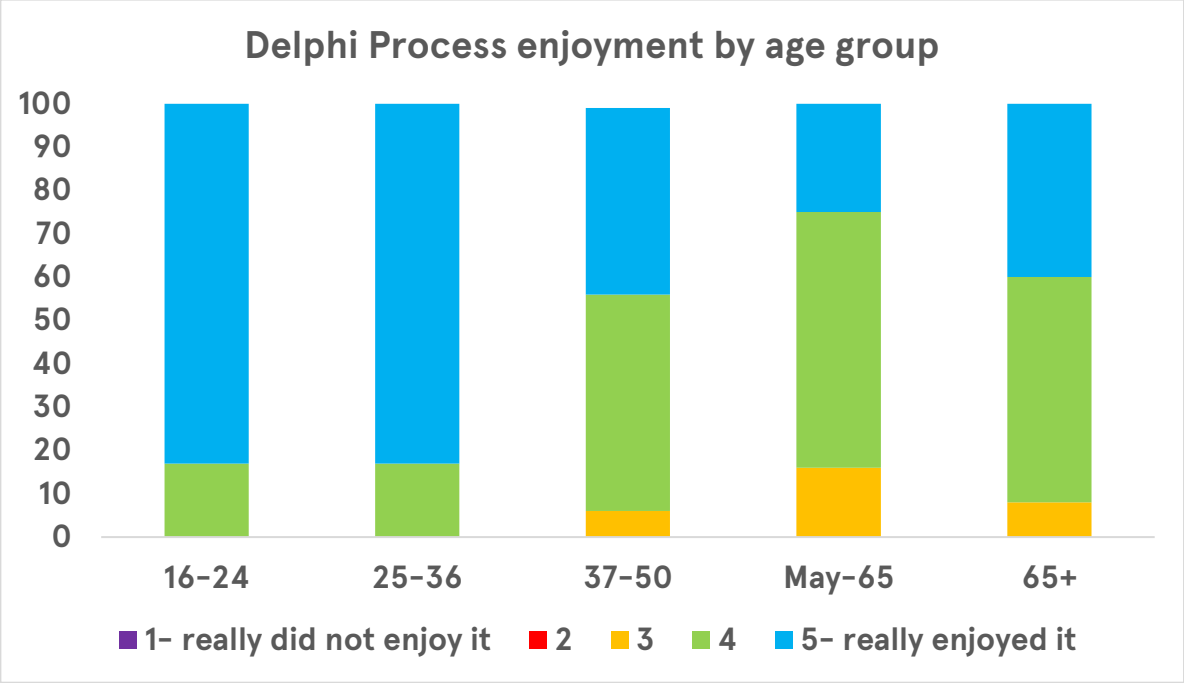

Figure 43: Enjoyment of Delphi Process participants by age

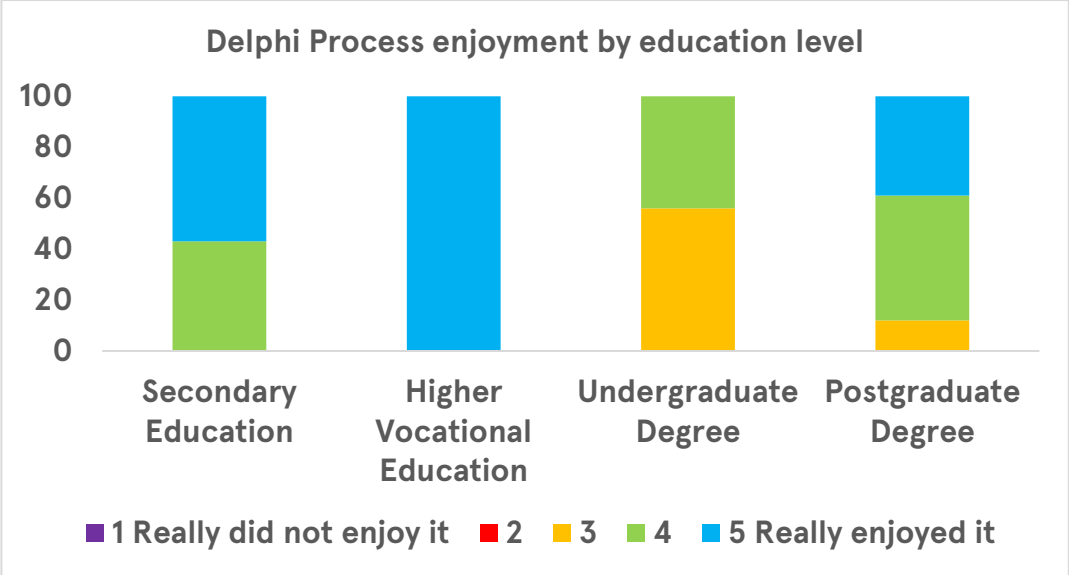

Figure 44: Enjoyment of Delphi process by education level

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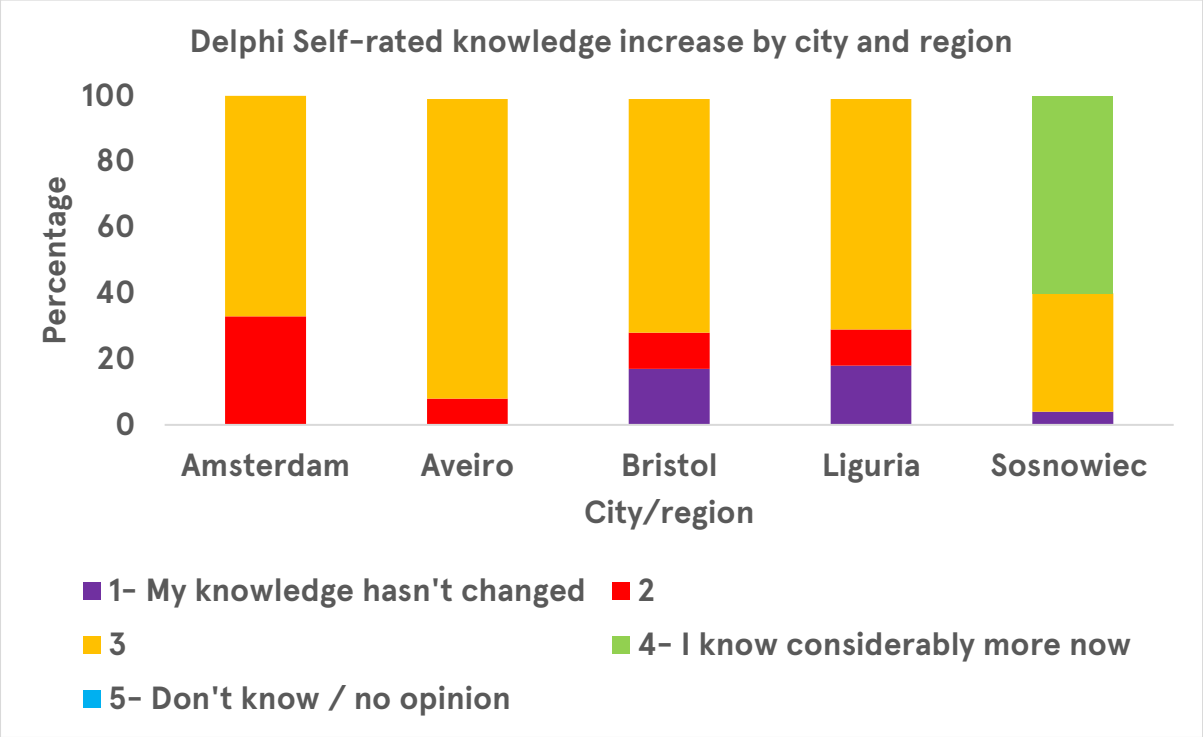

Figure 45: Self-rated knowledge increase of Delphi Process participants by city and region

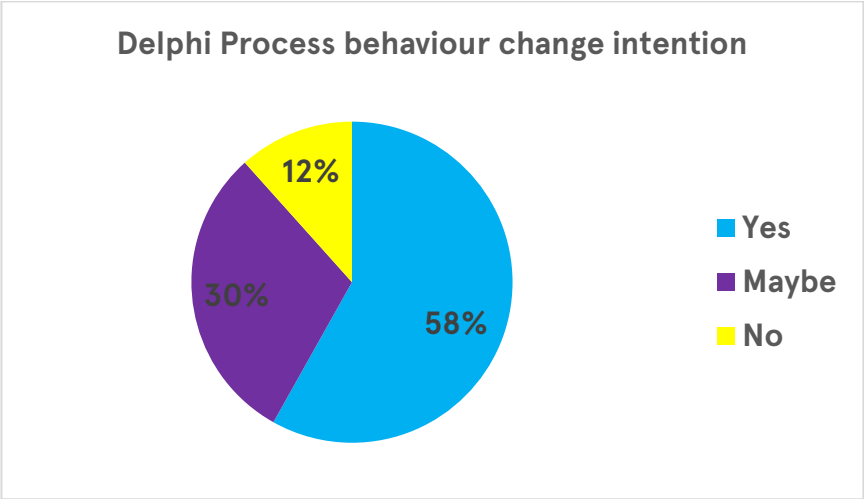

Figure 46: Behaviour change intention of Delphi Process participants

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The most noticeable feature, looking at the distribution of self-rated knowledge increase across cities/regions is that all the participants who felt they increased their knowledge considerably were from Sosnowiec – in fact the majority of participants in Sosnowiec (61%) gave their knowledge increase the highest possible rating.

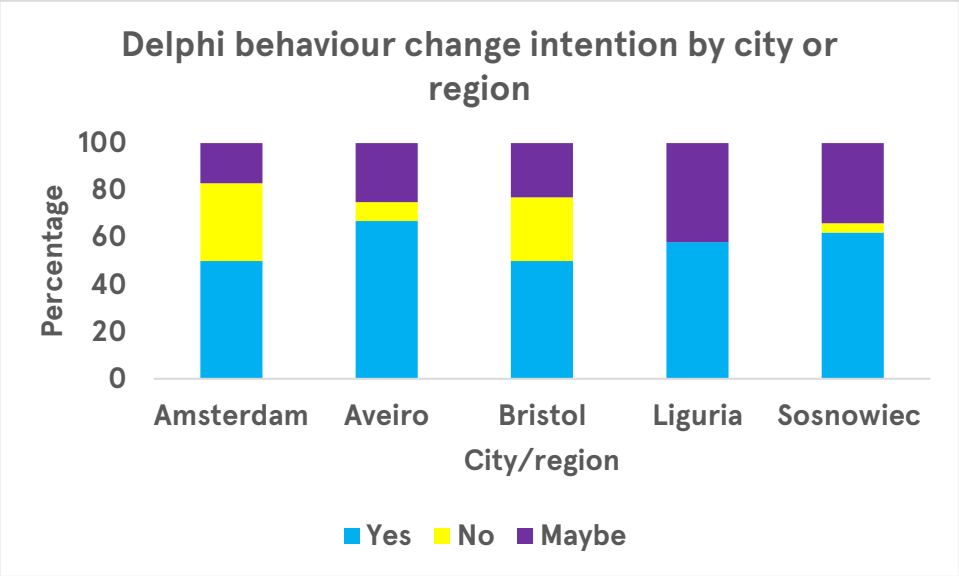

Figure 47: Behaviour change intention of Delphi Process participants by city and region

The proportion of participants who intended to change their behaviour following the Delphi process was broadly similar across cities/regions, ranging from 50% (Amsterdam and Bristol) to 66% (Aveiro). The most noticeable difference across cities was that participants in Amsterdam and Bristol were much more likely to say they would not change their behaviour. A Kruskall-Wallis test showed that there were highly statistically significant differences at the $p<.05$ level between how different cities rated their intentions to change their behaviour following ClairCity activities [$H(6)= 26.98$, $p<.000$]. This may be because people in Amsterdam are already living relatively green lives and feel they have fewer changes to make.

Looking at behaviour change intention by age and education level shows that those who were older (over 36) and more highly educated (undergraduate or postgraduate education) were more inclined to say they would not change anything. From the few comments which participants gave, it is possible that many of those who would not change felt they were already doing enough and that no further behaviour change was necessary for them.

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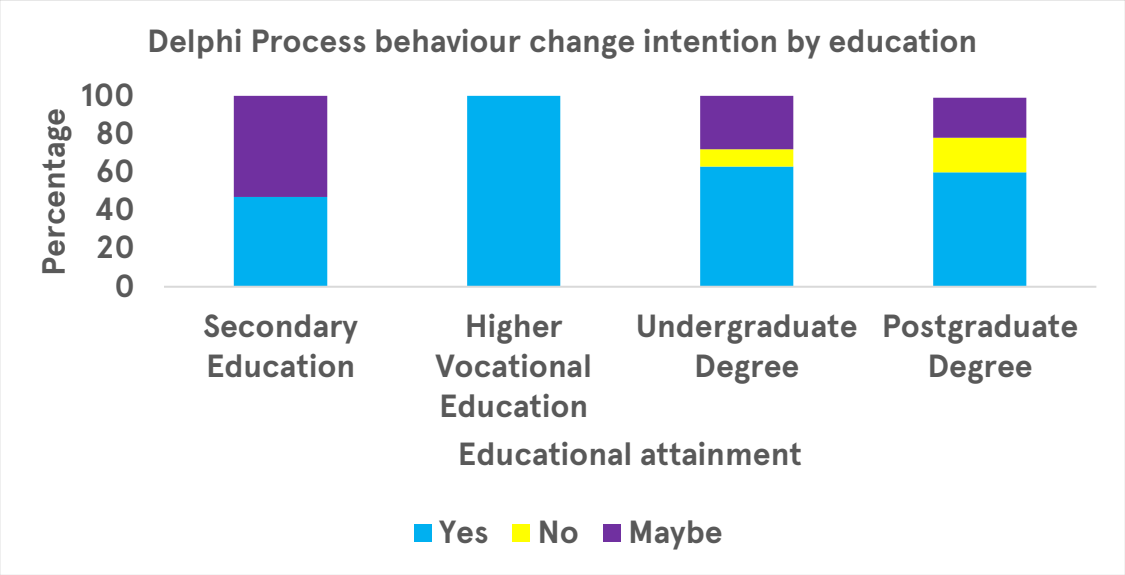

Figure 48: Behaviour change intention of Delphi Process participants by age

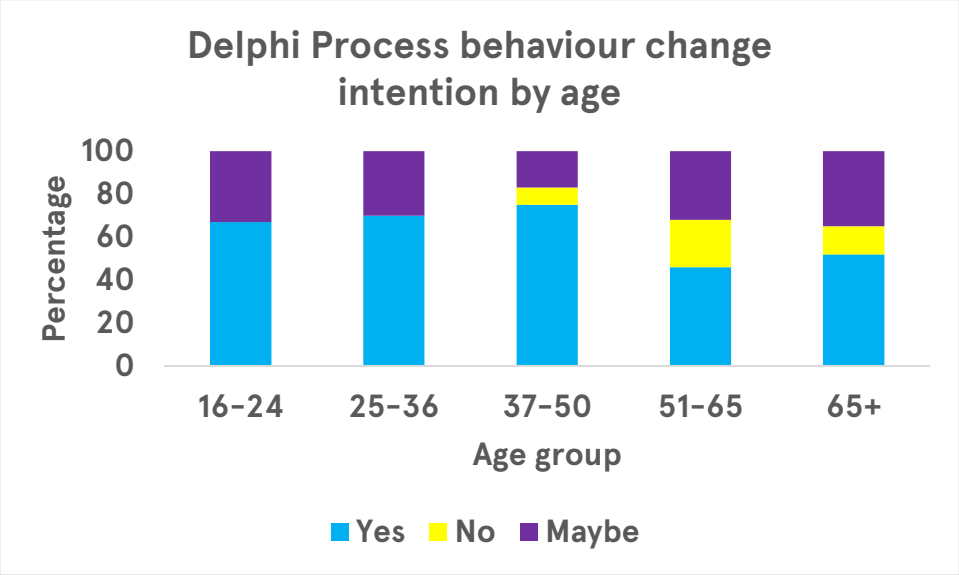

Figure 49: Behaviour change intention of Delphi participants by education level

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Table 14: Delphi engagement tool summary

What Worked Well	What did not work so well	How to do it better
Engaged with large numbers of people, across all cities.	The sample is not representative of local populations, although efforts were made to achieve representativeness.	Use closed questions in the questionnaires for easier analysis across cities.
Participants enjoyed the engagement process		Re-design workshops so the results are better utilised within the research process. Work with a smaller citizen assembly that is representative of the local demographic

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7.5. Skylines Game

7.5.1. Participant characteristics

Here we present participant characteristics regarding those who engaged with the Delphi Process. A total of 2800 people were engaged and the analysis is presented below.

Table 15: Skylines game engagement data across all cities

	Game		
	Total number of participants	Male/Female (%)	Most common age range
Amsterdam	371	69/30	25-34 (30%); 35-49 (30%)
Aveiro	243	55/44	16-24 (46%)
Bristol	836	65/32	16-24 (26%); 25-34 (30%); 35-49 (30%)
Liguria	66	44/50	35-49 (39%)
Ljubljana	24)	48/48	25-34 (38%)
Sosnowiec	949	67/32	16-24 (37%)
Other	307	67/31	16-24 (35%)
No response	4		
Total	2800		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

The Skylines game reached a total of 2,800 unique users (unique User ID, Gender and Age group; note: 2,628 different user IDs). Overall the participants were 63% male (Figure 50), however, in Aveiro only 54% were male (compared with 65% Sosnowiec and 64% Bristol). The most popular age range was 16-24 (31%) (Figure 51) but this varied across cities (Figure 52).

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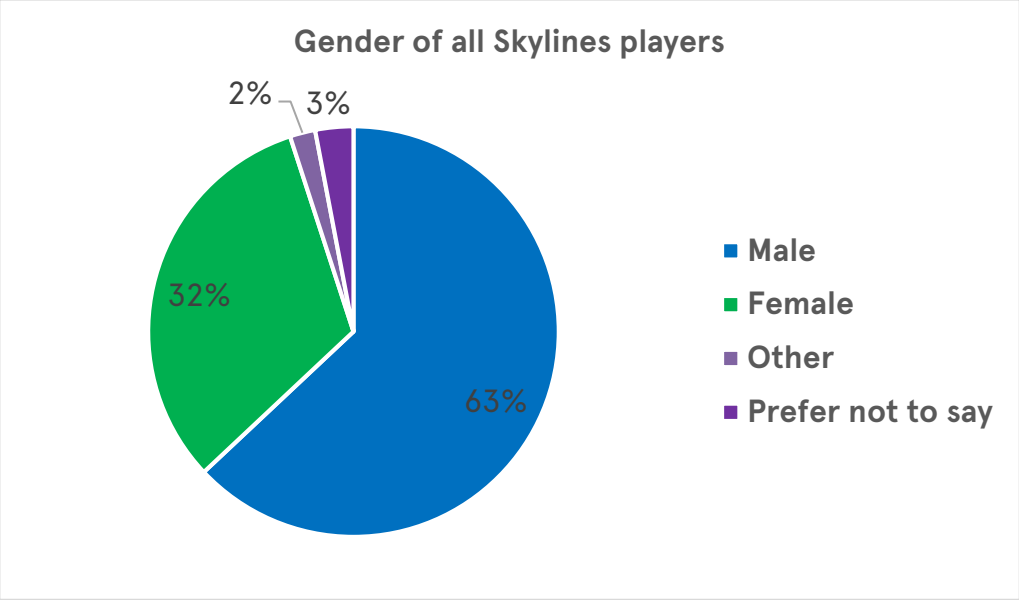

Figure 50: Gender distribution of Skylines players

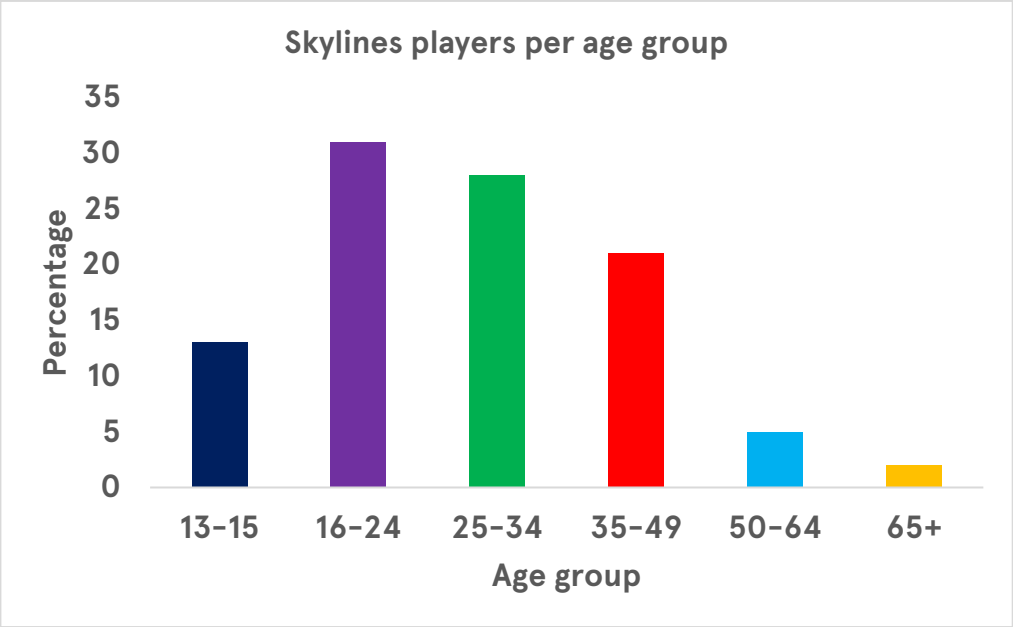

Figure 51: Age distribution of Skylines players

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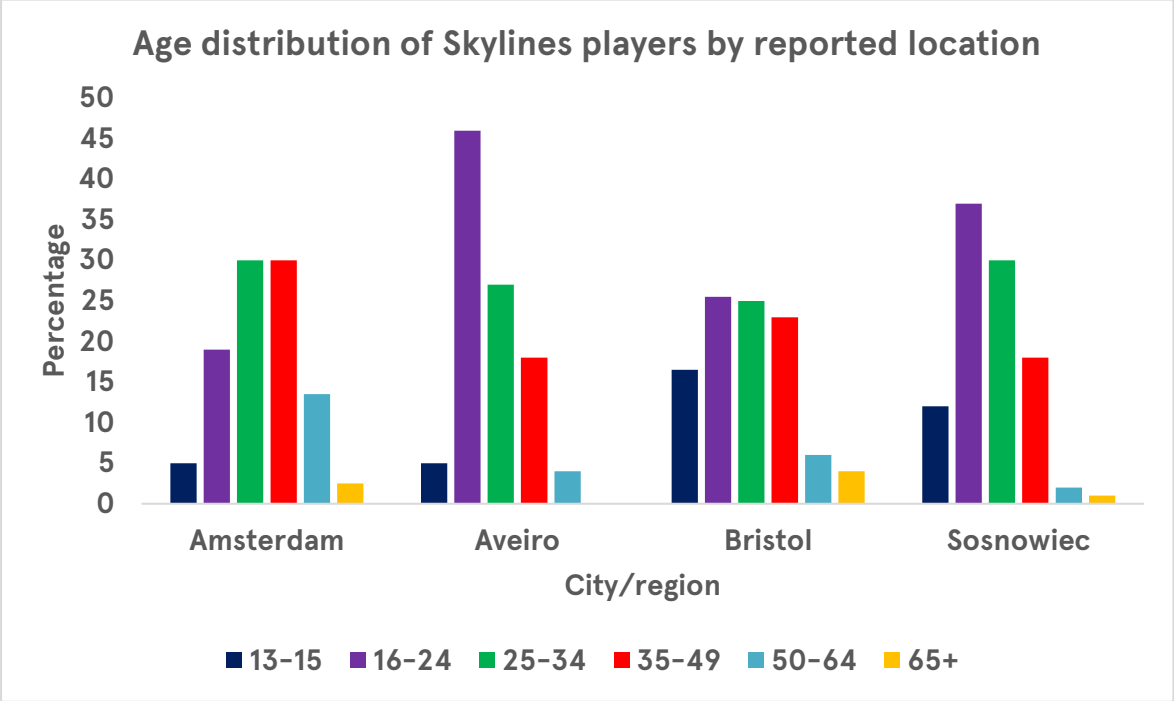

(where sample size was sufficient)[16]

Figure 52: Age distribution of Skylines players by reported location

7.5.2. Self-rated expertise

We asked gamers, prior to playing the game, how they rated their perceived level of expertise about air pollution. The mean expertise value was 1.6 out of 5 (*SD*=1.8), indicating that game participants felt they had little prior knowledge about air pollution, carbon emissions or health consequences.

Females tended to report higher levels of experience in relation to air quality/pollution (Figure 53), although a Kruskall-Wallis test showed that the difference was not statistically significant ($\chi 2=20$, $p=0.22$).

Around a quarter (28%) of players reported the lowest level of expertise about air quality/pollution. A lower percentage of gamers in Amsterdam and Aveiro reported having the lowest category of expertise (which is perhaps related to having higher age ranges of players). Younger participants tended to have less knowledge of air pollution and carbon emissions. Older participants were statistically more likely to declare they were well informed or experts (Figure 54). A Kruskall-Wallis test showed that these trends were highly statistically significant at the $p<.05$ level [$H(5) = 37.47$, $p<.000$].

[16] There were some players in Liguria and Ljubljana but the sample size was too small to be meaningfully analysed.

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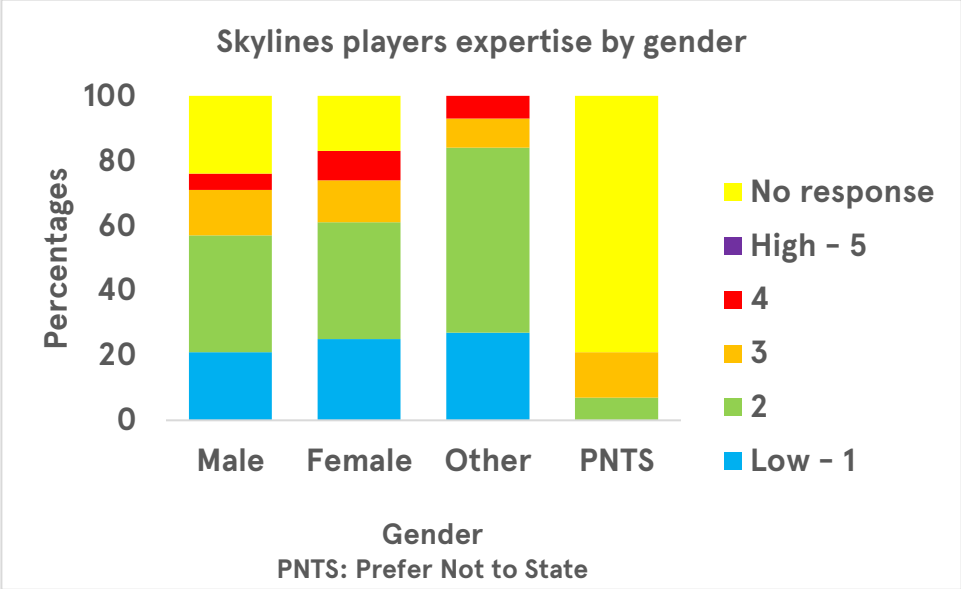

Figure 53: Expertise of Skylines players by gender

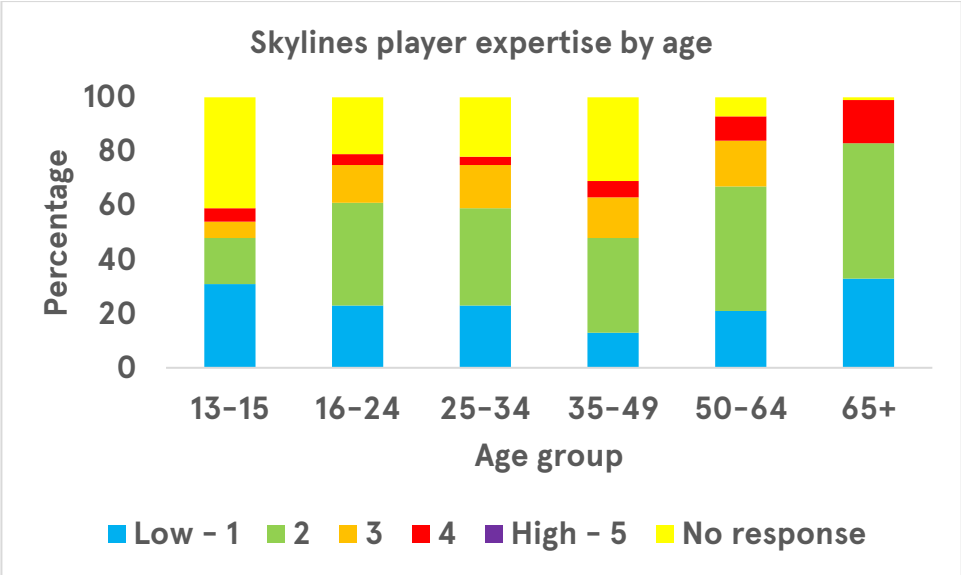

Figure 54: Expertise of Skylines players by age

7.5.3. Demographics of ClairCity Skyline evaluators

A total of 526 players of ClairCity Skylines responded to the evaluation questionnaire embedded in the game, 446 of those were from ClairCity cities/regions. The data analysis is presented below, including the participant characteristics of the people who evaluated the game (Table 16).

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Table 16: Skylines game evaluation data across all cities

	Skylines Game		
	Total number of feedback	Male/Female (%)	Most popular age group
Amsterdam	62	65/31	25-34 (29%)
Aveiro	73	55/40	16-24 (47%)
Bristol	39	74/18	13-15 (33%)
Liguria	18	39/50	35-49 (44%)
Ljubljana	5	20/80	25-34 (40%) and 35-49 (40%)
Sosnowiec	249	64/33	16-24 (38%)
Total	446		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

Evaluations came disproportionally from Sosnowiec (47%), with almost half of those who answered evaluation questions selecting Sosnowiec as their location.

Players who provided feedback are referred to in this report as "Skyline evaluators". The majority (74.8%) of Skyline evaluators (N=331) were male, reflecting the profile of the game players. Almost half of evaluation responses (48%) came from players aged 24 or less (Figure 55**Error! Reference source not found.**). Of those who gave themselves a "level of expertise" in topics related to air pollution, 75% rated themselves low or very low, which is lower than the overall sample. Nobody who completed the evaluation ranked their knowledge as "expert".

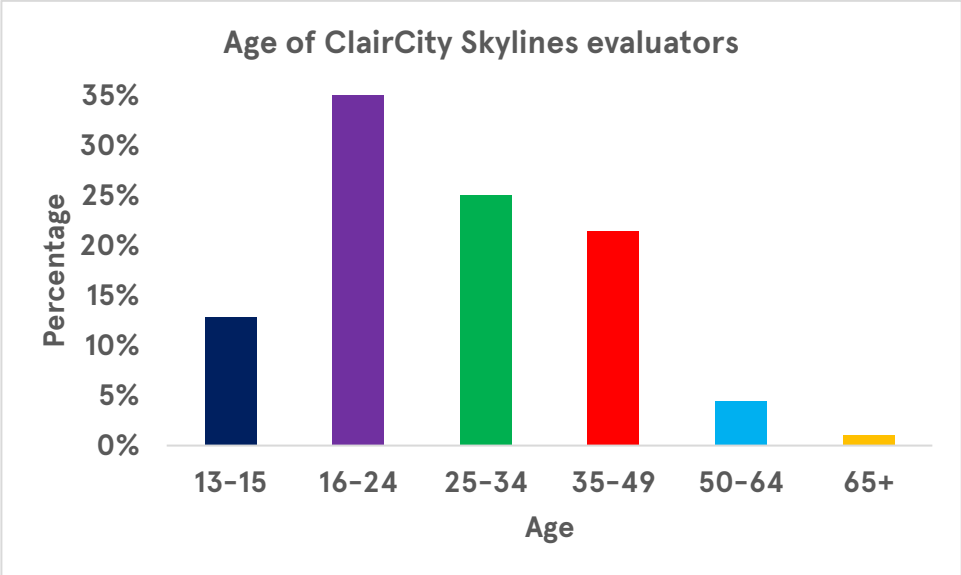

Figure 55: Age of Skylines evaluators

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The cities varied in the expertise level of the participants they recruited to evaluate the game. A Kruskall-Wallis test showed that there were highly statistically significant differences at the p<.05 level between the expertise levels of participants in the cities [H(6)= 35.6, p<.000]. Bristol and Sosnowiec recruited the highest proportion of their participants with no knowledge or little knowledge of air pollution (Figure 56).

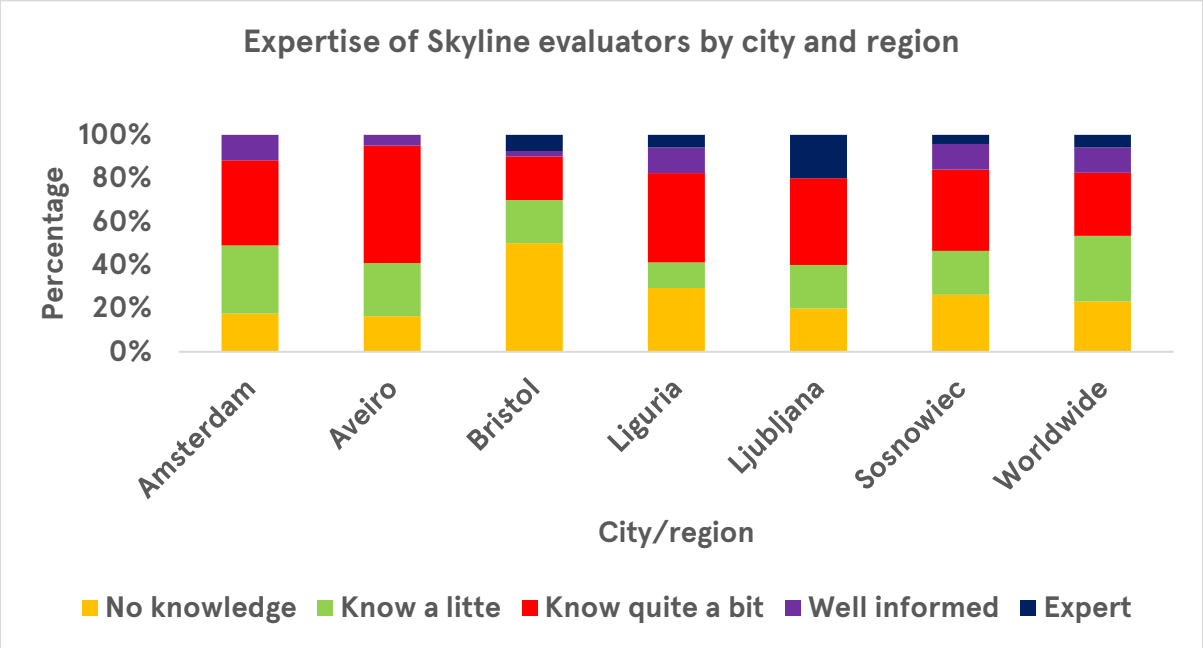

Figure 56: Expertise of Skylines evaluators by city and region

Across all evaluation participants, men tended to have lower self-declared expertise levels than women (Figure 57). This may be because more men played the game, possibly as they were attracted to the game format in and of itself. However, women who participated may have already been interested in the subject of air pollution, carbon emissions and health impacts. However, a Kruskall-Wallis test showed that these trends were not statistically significant at the p<.05 level [H(1) = 3.07, p=.08].

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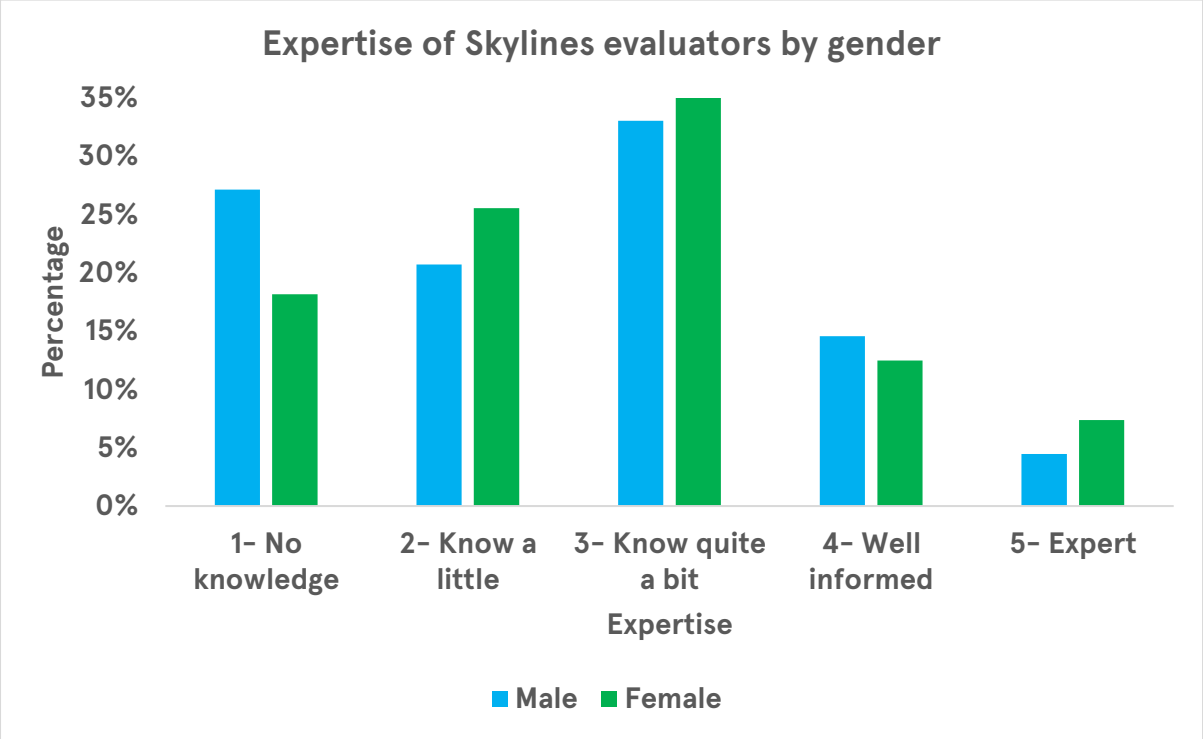

Figure 57: Expertise of Skylines evaluators by gender

As with the overall participants, younger evaluators tended to have less knowledge of air pollution and carbon emissions (Figure 58).

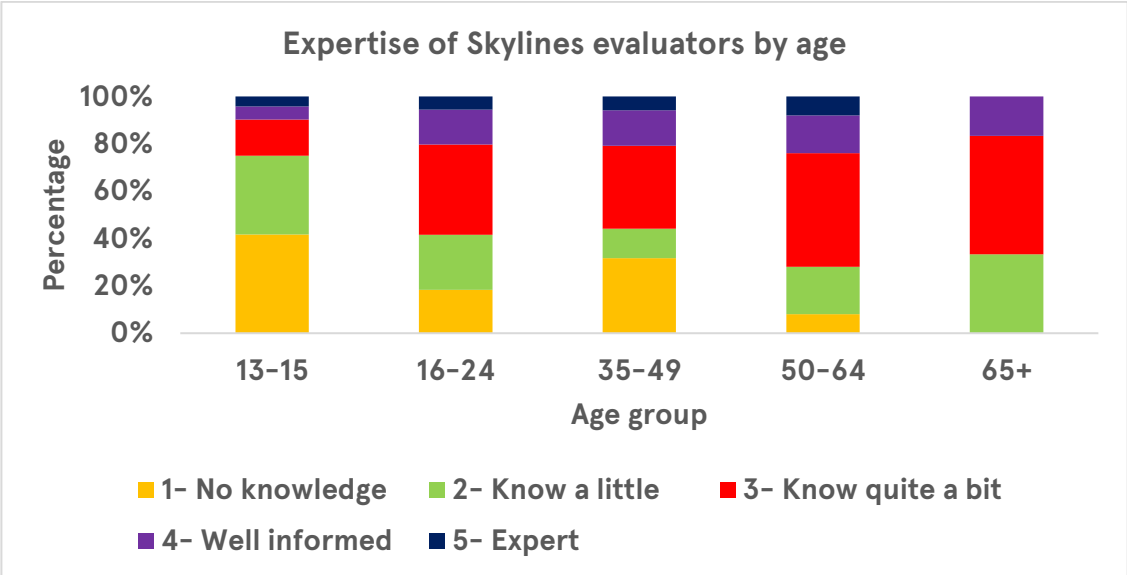

Figure 58:Expertise of Skylines evaluators by age

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7.5.4. ClairCity Skyline evaluators' perspective on the game and its impacts

90% of evaluation respondents were positive about ClairCity Skylines, scoring it 3 or more on a 5 point scale (Figure 59**Error! Reference source not found.**). Just over half (52%) of respondents scored the game 4 or 5. 10% of respondents (52) were negative (scores of 1 or 2) about the game. When enjoyment scores were cross-referenced with age, younger players tended to be more positive about the game than older players (Figure 60). Across the whole project, A Spearman correlation coefficient was computed to assess the relationship between participants' age and their enjoyment of the activities. There was a negative correlation between the two variables (rs(97) = -.311, p=.002) i.e. the younger the participants, the more likely they were to say that they enjoyed the activity.

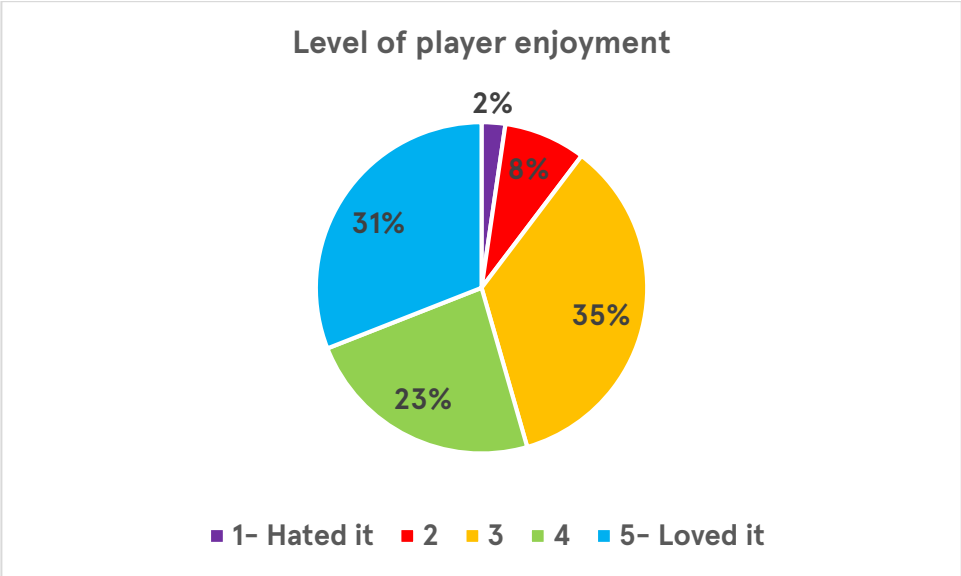

Figure 59 Level of enjoyment rated by Skyline evaluators

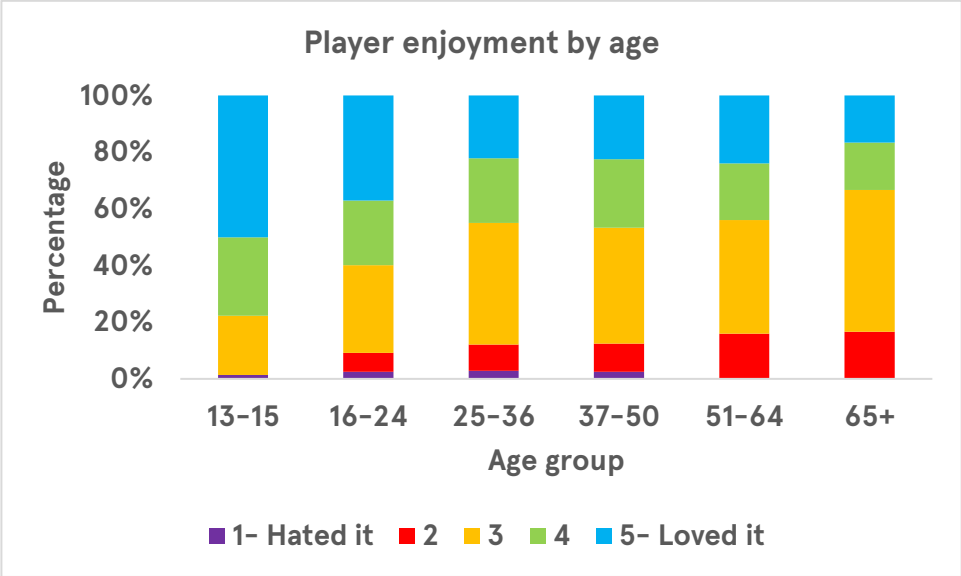

Figure 60 Level of player enjoyment by age

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In response to the question “Do you think you will do anything to help reduce air pollution and/or carbon emissions now you have played the game?”; an impressive 80% of players thought that after playing the game, they were likely to change their behaviour. This proportion was the same amongst male and female respondents, and broadly similar across age ranges. The 25-34 category were less likely to change, but the numbers of respondents in the over 65 category is very small for comparison.

There were no statistically significant differences in how men and women rated each activity for behaviour change. However, across the project, a Kruskall-Wallis test showed that there were highly statistically significant differences at the p<.05 level between how different age groups rated their intentions to change their behaviour following ClairCity activities [H(5)= 27.64, p<.000].

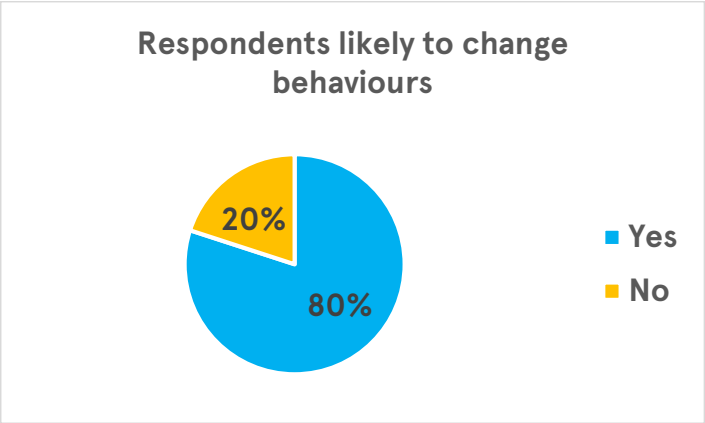

Figure 61: Respondents likely to change behaviours after playing Skylines

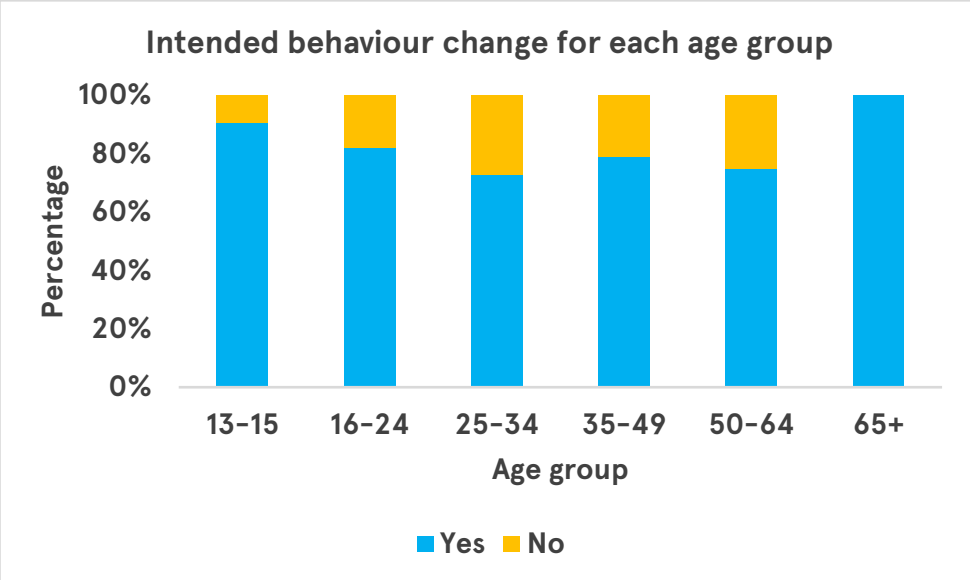

Figure 62: Behaviour impact of ClairCity Skylines by age category

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Table 17: Skylines Game engagement tool summary

What Worked Well	What did not work so well	How to do it better
Able to crowdsource public opinion – especially the youth voice as they have grown up with digital technology.	Games do not appeal to all demographics	Actively reaching out to different groups, such as elderly, minority groups, etc. through public events.
	Needs to be promoted far and wide to recruit participants, with face-to-face as well as online interaction.	

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7.6. GreenANTS App

7.6.1. Participant characteristics: Who did the game engage with?

Full participants' characteristics are not available for the GreenANTS App, as these details have not been collected. When reviewing this data it is important to remember that the App was only developed to TRL3 and that the testing parties were all ClairCity consortium partners and friends. The aim was to understand the problems associated with the App and try to move it forward beyond TRL3. A total of 98 people tested the app, across all cities, with 37% of the respondents coming from Amsterdam and 22% from Aveiro (Table 18).

Table 18: GreenANTS App engagement data across all cities

	App		
	Total number of participants	Male/Female (%)	Most popular age range
Amsterdam	36	not collected	not collected
Aveiro	16	not collected	not collected
Bristol	22	not collected	not collected
Liguria	7	not collected	not collected
Ljubljana	1	not collected	not collected
Sosnowiec	16	not collected	not collected
Total	98		

7.6.2. Participants' feedback on the GreenANTS App

Here we present the feedback given by those testing the app. A total of 98 surveys were collected and the analysis is presented below. Most people who rated the app did not enjoy it (59%), stating they either hated it or disliked it (Figure 63).

The most popular rating app users gave about their understanding after using the app was ambivalent, feeling their understanding had neither increased or decreased (43%), while a some users felt much more confused (18%).

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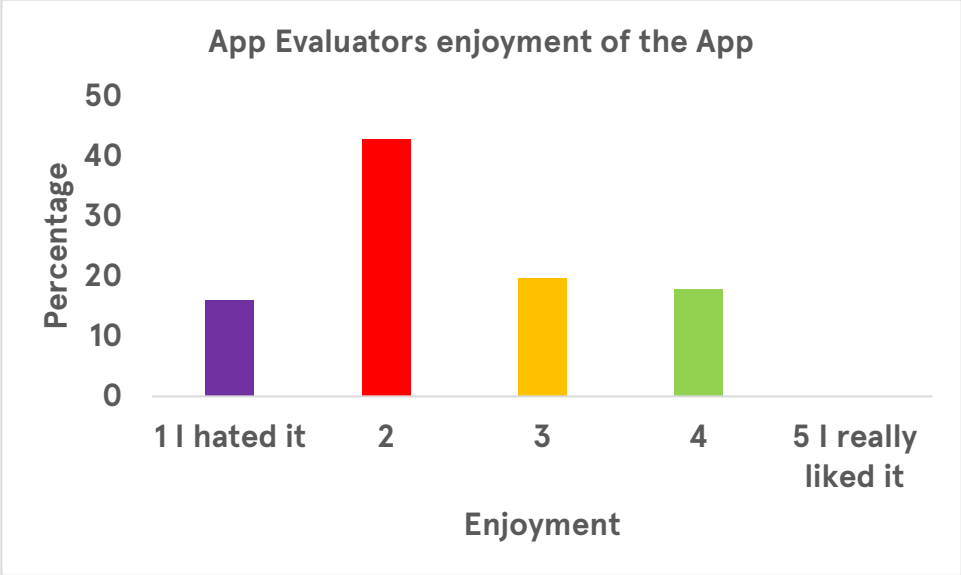

Figure 63: App enjoyment of evaluators

Thirty one users gave comments on the app. Most of these comments related to the app crashing or not being user friendly, which explains the negative enjoyment and ambivalent understanding ratings. The issues the comments addressed are summarised as follows:

1. **Errors and Crashes** (n=23)
    a. Distances or emissions incorrectly calculated (n=7)
    b. Crashes (n=5) | Switches off unexpectedly (n=5)
    c. App not saving data (n=3)
    d. Have to restart (n=1) | Could not open the health section (n=1) | Unspecified errors (n=1)
2. **User Friendliness and Design** (n=14)
    a. Not user friendly (n=6)
    b. Information is hard to understand (n=2)
    c. Menu errors (n=1) | Text needs editing (n=1) | Colours for transport mode are too similar (n=1) | Graphs are unclear (n=1) | Design is old fashioned (n=1) | Design is unattractive (n=1)
3. **Difficulties selecting the means of transportation** (n=5)
    a. App selects the wrong means of transport (n=4)
    b. Could not choose cycling as a means of transport (n=1)
4. **High battery consumption** (n=5)
5. **Privacy or security concerns** (n=3) | Incorrect pollution data (n=3)
6. **App did not work well** (n=2) | Not able to install app (n=2)

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A substantial minority of users (36%) stated they would change their behaviour after using the app. Most of those said they would walk, cycle, or take public transport more often (76%).

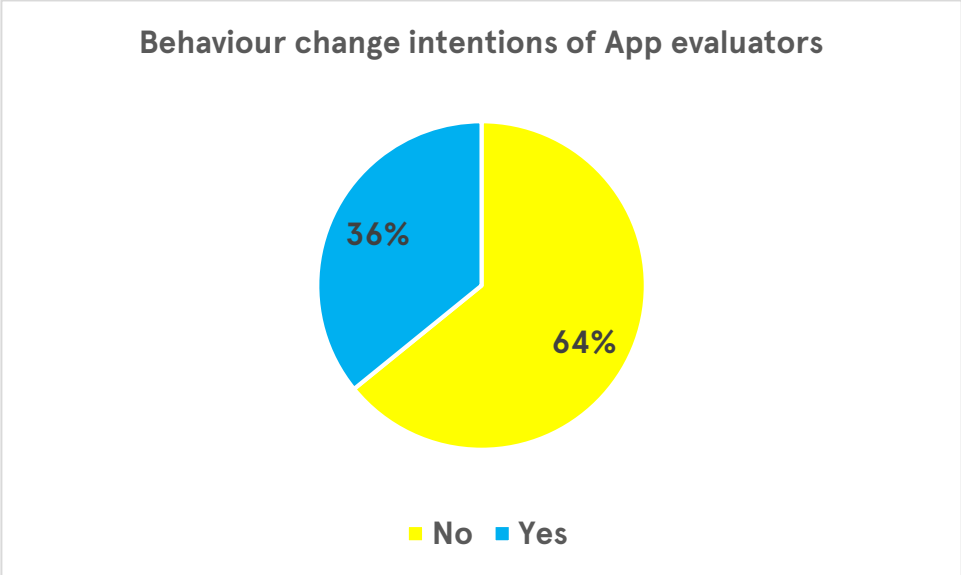

Figure 64: App evaluators behaviour change intentions

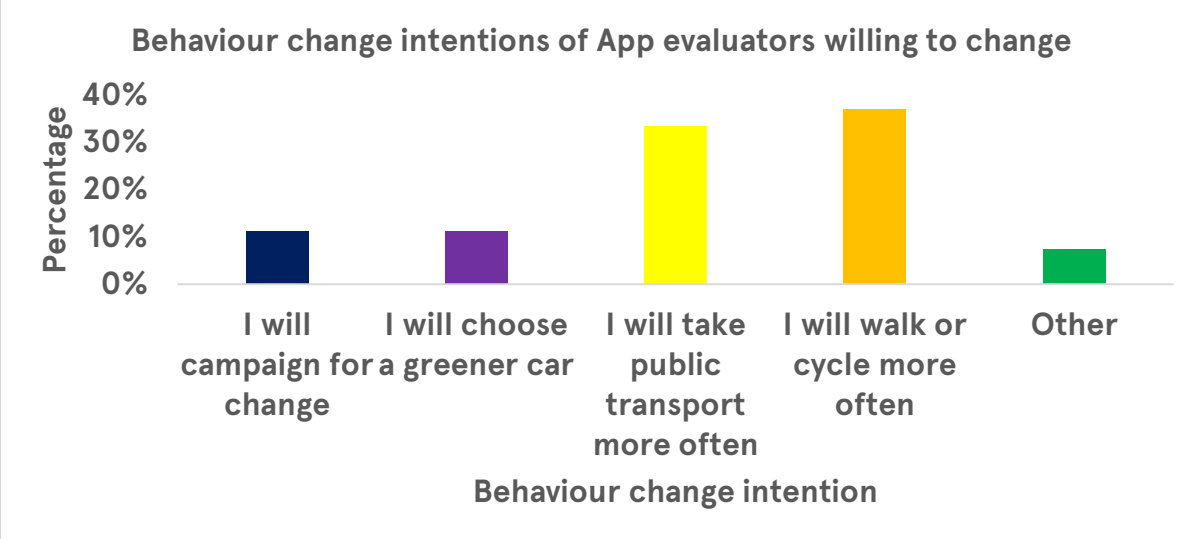

Figure 65: Behaviour changes intentions of App evaluators willing to change

Bristol was the only city where the app was rated at all positively, with 17% of respondents saying they liked it. Bristol also had the highest proportion of respondents who felt they understood more after using the app (33%). Unsurprisingly, Bristol had the highest proportion of respondents (50%) who said they would change their behaviour after using the app (Figure 66).

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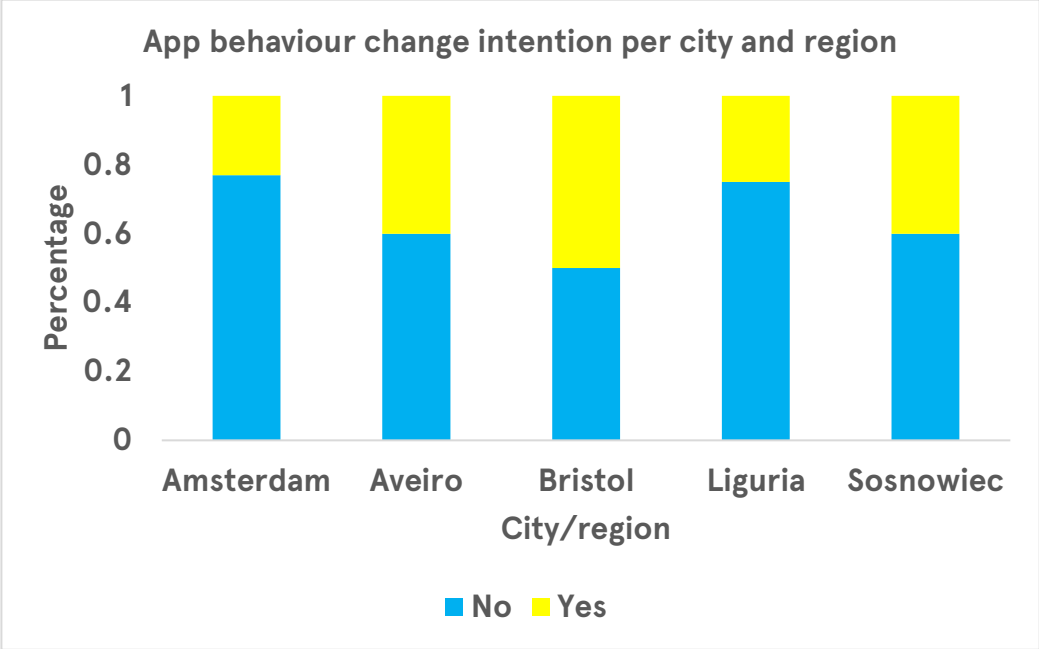

Figure 66: Behaviour change intentions of App evaluators by city

A summary of the evaluation for the GreenANTS app is provided below.

Table 19: GreenANTS App engagement tool summary

What Worked Well	What did not work so well	How to do it better
There is an appetite for apps about air pollution as people want to access health data.	**When people are able to see others' data it brings up many ethical questions.**	**Discuss these ethical concerns with expected users. Work through solutions together.**
	Requires a lot of targeted promotion with a unique selling point to reach critical mass.	**Consider partnering with a well-known app company/high profile organisation with a well-established brand.**

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7.7. Mutual Learning Workshops

7.7.1. Participant characteristics

A total of 138 people engaged with the Mutual Learning Workshops (MLWs). Stakeholders were a mix of environment, health or climate change experts, NGOs and some local authorities. There was an even spread of participants across the six cities/regions, with Liguria (n= 37; 27%) and Bristol (n= 34; 25%) attracting bigger groups of participants (Table 20). Across cities, participants in the MLWs were 56% male and 44% female. Data on participants' age range was not collected.

Table 20: Mutual learning Workshops engagement data across all cities

	MLWs		
	ML Workshops Total no participants	ML Workshops Male/Female	ML Workshops most popular age range
Amsterdam	13	8M/5F	not collected
Aveiro	13	4M/9F	not collected
Bristol	34	17M/17F	not collected
Liguria	37	25M/12F	not collected
Ljubljana	17	10M/7F	not collected
Sosnowiec	24	13M/11F	not collected
Total	138		

7.7.2. Participants and organisers' feedback on the MLWs

Evaluation of the Mutual Learning Workshops was optional. One city (Sosnowiec) carried out formal evaluation (online surveys) while all the other cities/regions opted for collecting informal feedback from the participants. Most cities agreed that the events were a great way to bring together experts from different fields (energy, transport, health) within the same room in order to discuss future city plans affecting air quality. Both Amsterdam and Bristol reported that it was difficult to get participants to discuss specific measures and actions and so more thought is needed for organising the workshops to allow this.

Participants (N=16) in Sosnowiec completed a questionnaire at the end of the workshop, with the vast majority (88%) stating they either really liked it or liked the workshop. Interestingly, opinions were split when it came to assessing if the participants felt they had more knowledge about air pollution after having participated in the MLW. Eight participants stated they did not (50%) and seven (44%) say they thought they had more knowledge (one participant did not answer this question).

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Asked if they would like to get involved in the implementation of the ClairCity project in Sosnowiec, 50% said they did, 31% said maybe and 19% stated they did not have time for that level of involvement.

Table 21: Mutual Learning Workshops engagement tool summary

What Worked Well	What did not work so well	How to do it better
Attracted a good mix of stakeholders.	**Stakeholders were mostly from the environment and social field, with fewer from the economics field.**	**Invite/engage participants from the business sector.**
The concept of mutual learning for scenario building towards 2030.	**The scenario building for 2050 was quite challenging for the MLW participants.**	**More time and deeper discussion on the vision of the future of the city would be useful, followed by discussions on the measures on transport, energy use, etc.**

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7.8. Schools Competition

The school competition was designed and delivered using an online educational tool developed by REC and Progressive Company (Hungary). Two cities, Amsterdam and Bristol did not run the Schools Competition, but instead delivered lectures and workshops to schools. Both found that the national schools curricula were too restrictive to allow pupils time to take part in the online competition in school hours. Teachers in both countries stated that schools activities would need to be linked to the curricula or feature interactive demonstrations. The activities were therefore adapted further and are described below.

7.8.1. Participant characteristics: Who did the Schools Competition engage with?

The Schools Competition involved a total of 26 schools across five cities/regions), with 447 children participating. Liguria (29%) and Aveiro (23%) were the regions that managed to involve the highest number of pupils. However, Sosnowiec was the city that engaged with the highest number of schools, a total of 11 (42% of the total number of schools involved). Participants' age ranged from 12 (youngest age in Aveiro) to 16 (Table 22).

Table 22: Schools Competition engagement data across all cities

	Schools Competition			
	Total number of participants	Number of Schools	Male/Female (%)	Most popular age range
Amsterdam	92	2	not collected	15-16 years old
Aveiro	105	6	not collected	12-15 years old
Bristol	55	3	not collected	13-14 years old
Liguria	130	4	not collected	13-16 years old
Ljubljana	N/A	N/A	N/A	N/A
Sosnowiec	65	11	not collected	13-16 years old
Total	447	26		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

Amsterdam decided not to run the School Competition and instead ran a school activity in four 4th grade pre-university classes with a total of 92 students (15 and 16 years old), across two schools.

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Bristol also did not run the School competition. Instead, the UWE team delivered workshops and lectures at three different schools, engaging a total of 95 students aged 13 and 14 years old (this is in addition to the primary schools activities listed previously).

In the Aveiro region the School Competition took part in full; 19 teams were involved in the competition (105 students and 10 teachers involved, from six different schools). Students ranged from 12 years old (the youngest across all cities/regions) to 15 years old.

In Genoa, in the Liguria region, 23 teams participated, involving a total of 130 students (age ranged from 13 to 16) across four schools.

In Sosnowiec, 13 teams from 11 schools were involved, with 65 students taking part (aged 13 to 16), both primary and secondary schools.

7.8.1. Teachers' feedback on the School Competition

Here we present the feedback given by teachers involved in the Schools Competition. A total of 19 surveys was collected and its analysis is presented below.

Table 23: Schools Competition evaluation data across all cities

	Schools Competition		
	Total number of feedback	Male/Female (%)	Most popular age group
Amsterdam	1 (informal)	0/100	not collected
Aveiro	7	0/100	51-65 (57%)
Bristol	2	50/50	35-49 (100%)
Liguria	4	50/50	35-49 (40%)
Ljubljana	No data available at the time of report writing		
Sosnowiec	5	20/80	35-49 (60%)
	19		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

In total, 18 teachers or education specialists reviewed and evaluated the School Competition package from four of the ClairCity cities/regions. No Ljubljana teachers were able to participate.

Seven of the teachers were science specialists, six were geography teachers, and a further four who gave information on their specialism were a maths teacher, English teacher, literature teacher and an early years specialist. Four were male, 13 were female and one did not offer their gender. Five of the teachers were aged over 50 and four were aged 34 or less, with eight teachers falling into the 35-49 age range and one not sharing their age.

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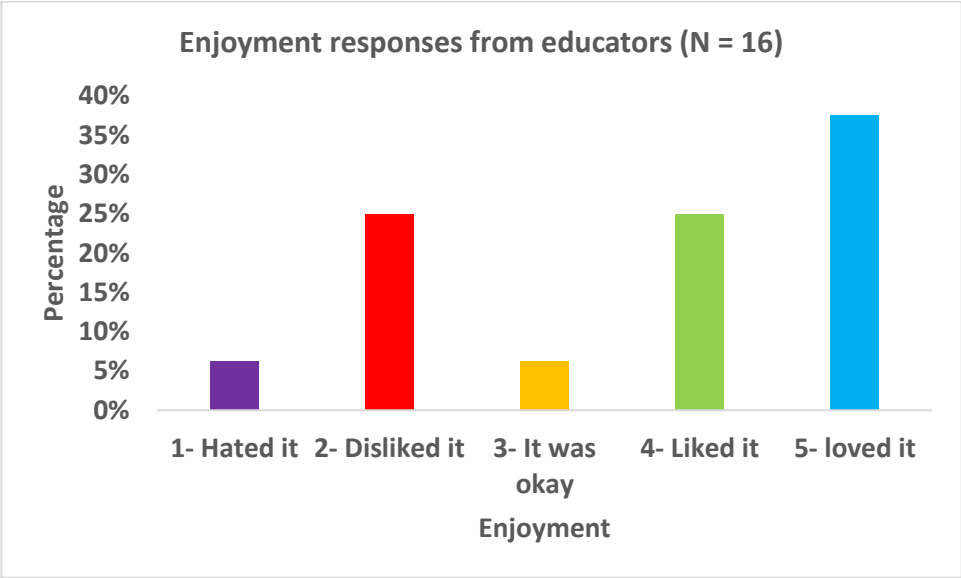

Figure 67: Educators reported enjoyment of Schools Competition resources

Overall responses were broadly positive (Figure 67), with 10 teachers out of 16 (two respondents did not answer this question) saying they liked or loved the resources, whilst five disliked or hated them. Most felt that the activities would increase their students' understanding of issues related to air quality, carbon emissions and health, and that the activity would be motivational in getting students more interested in local issues and more likely to make changes in their own lives.

7.8.2. Additional school activities

In addition to the activities described above and the Schools Competition, the following activities took place, funded by local resources (not the ClairCity budget), but using the resources developed as part of the ClairCity project.

Bristol developed new educational materials for primary and secondary schools, which are freely available online. The materials discuss air pollution, carbon emissions, and actions to make a difference locally. Approximately 800 children were involved in ClairCity primary schools workshops in Bristol (6-11 year old), with materials available on the ClairCity website. The materials were also included in the British Science Association teaching pack with 102,000 downloads (See Appendix 0).

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The Aveiro team took the opportunity to engage with additional schools, as well as those that took part in the School Competition. The University of Aveiro research team delivered workshops in which they talked about air pollution, carbon footprint, and other health topics. This introduction was followed by a presentation of the ClairCity project and all ClairCity activities. The Aveiro team delivered a total of 25 sessions, reaching approximately 1194 students aged 8 to 18 in 15 schools.

Table 24: Schools Competition engagement tool summary

What Worked Well	What did not work so well	How to do it better
Spread over several lessons, these type of schools engagements allow for deeper exploration of an issue.	**Some countries have curriculum constraints, meaning schools do not have time for multiple engagements.**	**Approaching educators, to ask what works best for them. Work together on creating a tailored plan for the context.**
	The School Competition required the use of an online platform, with preformatted questions that may not be relevant to all contexts.	**Experimenting with an analogue version, or making the digital element more flexible.**
	Requires a lot of initial investment from the educator and children.	**Seeing if the educator can theme the curriculum around this topic. Alternatively, present single lesson plans.**

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7.9. My City Videos

7.9.1. Participant characteristics

The My City Videos initiative aimed to engage over 60 older people to make films about non-motorised transport. This engagement tool involved 65 people across all cities and regions and all participants were aged 55 or above. Aveiro involved 40% of the total participants; this successful recruitment of participants was due to their approach working closely with community groups. The leaders/managers of these groups were particularly active in recruiting participants and, more importantly, in developing the videos with the senior citizens.

Table 25: My City Videos engagement data across all cities

	My City videos		
	Total number of participants	**Male/Female (%)**	**Most popular age range**
Amsterdam	**9**	**44/56**	**All Participants were aged 55+ as this was a requirement of the activity**
Aveiro	**26**	**38/62**	**Participants were 55+**
Bristol	**10**	**30/70**	**Participants were 55+**
Liguria	**5**	**80/20**	**Participants were 55+**
Ljubljana	**6**	**100/0**	**Participants were 55+**
Sosnowiec	**9**	**67/33**	**Participants were 55+**
Total	**65**		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

Overall, 60% of those engaged with the My City videos were male. In Ljubljana, all participants were male and in Liguria four out of five were male. It was a different scenario in Aveiro and Bristol, with both cities engaging with more female than male participants.

7.9.2. Participants' feedback on the My City Videos

Here we present the feedback given by those taking part in the My City Videos. A total of 13 surveys were collected (3 of which were only informal feedback and do not form part of the data analysis) and the analysis is presented below. Participants giving feedback were 60% Female and 40% Male. Ages ranged from 28 to 71 years old, with a median age of 48.

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Table 26 My City videos evaluation data across all cities.

	My City Videos		
	Total number of feedback	**Male/Female (%)**	**Most popular age group**
Amsterdam	**3 (informal)**	**30/70**	**not collected**
Aveiro	**4**	**25/75**	**25-34 (75%) [1]**
Bristol	**2**	**50/50**	**51-65 (50%) and 65+ (50%)**
Liguria	**2**	**50/50**	**35-49 (100%)**
Ljubljana	**N/A**	**N/A**	**N/A**
Sosnowiec	**2**	**50/50**	**51-65 (50%) and 65+ (50%)**
Total	**13**		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.
[1] Community groups "leaders", who worked with senior citizens to deliver the videos were the ones that filled in the evaluation form, hence the age data.

The Amsterdam team collected informal feedback from participants. The highlights of that feedback are the following:

- Having to make the videos themselves, as well as submit them online was a substantial barrier to participation.
- Some participants stated they did not sufficiently understood the link between what they were asked for the video competition and improving air quality policy in the city. Some people who did care about air quality said that this reduced their willingness to participate.
- Several people did not want to be filmed for privacy reasons, or they did not want a movie of themselves to be uploaded on YouTube.

7.9.3. Motivations and enjoyment from participation

The overwhelming majority of video participants enjoyed taking part (90% - 9 of 10) (Figure 68).
Each participant had individual reasons for how much they enjoyed being involved in the video competition. One of the younger participants mentioned that it was enjoyable to "see the total openness of seniors", while conversely, one of the seniors mentioned being able to "show [by] example that you can spend free time actively outside the home at my age". Others simply found the topic interesting, or were buoyed by the interest and enthusiasm of others involved in the project. Negative comments included being camera shy and not being satisfied with the person who recorded the film.

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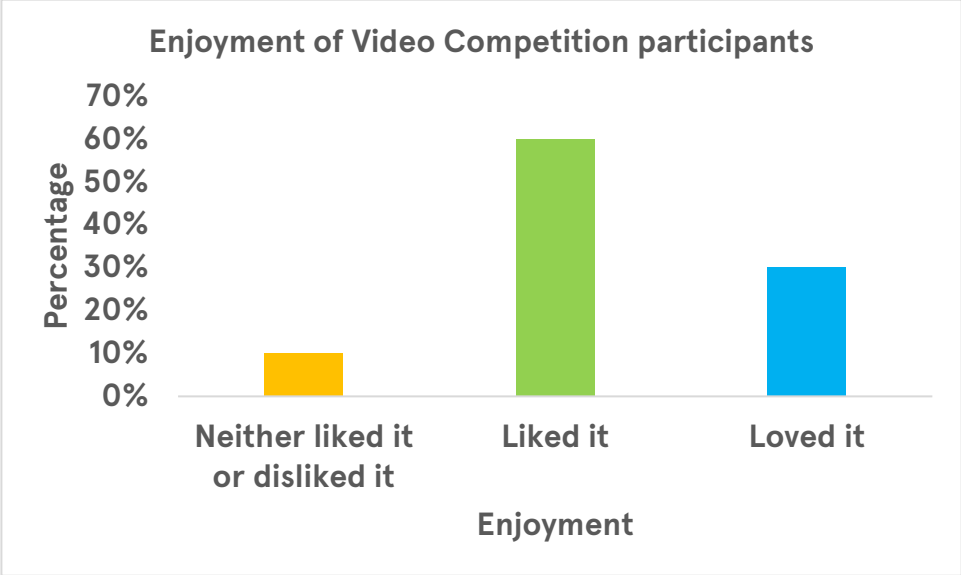

Figure 68: Enjoyment of Video Competition participants

Participants gave very varied reasons for taking part in the video project, as summarised below:

- **Promoting Sustainable Mobility (3 mentions)**
  - "I wanted to tell people of all ages that they should leave the house, spend some time in the open air in our city, district"

  The most frequently mentioned reason for taking part in the video competition was to promote sustainable mobility by encouraging others to go outside and be active.
- **Sharing a Passion or Interest (2 mentions)**
  - "I wanted to talk about my love of cycling"
  - Two participants mentioned wanting to share an interest with others.
- **Importance of the Theme (2 mentions)**
  - "for the important theme of sustainable mobility"

  Two participants mentioned that they felt the importance of the theme of sustainable mobility was a motivating factor.
- **Combating Stereotypes and Fostering Inter-generational Relationships (2 mentions)**
  - "The opportunity to promote other means of transport, even when driven by older people, was considered vital in combating stereotypes associated with aging"
- **Having a Say (2 mentions)**
  - "wanted to 'have my say'."

  Two participants mentioned that they wanted to use the video competition as a way to express their opinion.
- **Other Motivations:** In addition to the motivations listed above which were expressed by more than one participant, there were also many individual motivations for taking part. These ranged from curiosity and learning, to wanting a challenge or recognition,

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wanting to impact health and air quality, improve cycling infrastructure, and feeling more included in a technological society.

7.9.4. Expected audiences and outcomes

While some participants had not considered the audience of the videos at all, most wrote about maximising the reach of the videos as far as possible, hoping the videos would be seen in some cases by "the majority of the residents", "as many people as possible", "any person", or "people of all ages". Specific audiences which participants mentioned included "administration", "citizens" and "friends".

One participant mentioned that opportunities for maximising the reach of the video may have been missed, saying, "I think that the conference itself could also be a means of disseminating the videos. It only passed quickly at some intervals without being given due importance." This quote shows that disseminating the videos widely is not just about reaching a wider audience, but also about showing participants that their contribution is valued and seen as important.

The most frequently mentioned expected outcomes were about encouraging others to take action, for example by cycling more, living a more sustainable lifestyle in general, or spending leisure time outside. One participant also mentioned the importance of raising awareness of travel and exposure to air pollution.

Whether the experience met participants' expectations or not was rather mixed. Those who felt their expectations had been met often mentioned the wider impacts of the project beyond simply participating, such as the project becoming the subject of debate at a local healthy ageing programme, "lively" audience reaction when the video was shown, and being able to encourage others to live a healthy lifestyle. One participant also mentioned that receiving certificates meant the seniors felt valued.

Those who were mixed about the video competition expressed a sense that only the minimum had been achieved – they had managed to "contribute something", or "some person participated". Others who were more negative cited the unfairness of the competition voting which meant "the competitor who spends the most time self-promoting wins, instead of the one who spends the most time producing the video", and that more people could have been engaged.

There is not enough feedback data available to comment on the following evaluation questions:

- Are people who engaged with the videos planning on doing something different?
- What differences can we see across countries?

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A summary of the evaluation for the videos is included below.

Table 27: My City Videos engagement tool summary

What Worked Well	What did not work so well	How to do it better
Videos appeal to a wide audience and are shareable online (YouTube).	**Can require a lot of targeted promotion to spread the message.** **Some groups (e.g. old people, introverts) may find this method intrusive.** **May be labour intensive, requiring film kit and editing abilities.**	**Targeting promotion to relevant local groups or associations.** **Asking participants how they would like to share their story.** **Working with film students to keep costs down.**

ClairCity received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 68928.

7.10. Stakeholder Dialogue Workshops

7.10.1. Participant characteristics

Here we present participant characteristics regarding those who engaged in the Stakeholder Dialogue Workshops. A total of 113 people were engaged and the analysis is presented below.

Table 28: Stakeholder Dialogue Workshops engagement data across all cities

	Stakeholders workshops		
	Total number of participants	Male/Female (%)	Most common age range
Amsterdam	19	42/58	N/A
Aveiro	12	42/58	40-49 (42%)
Bristol	13	69/23	37-50 (31%) and 51-65 (31%)
Liguria	14	N/A	N/A
Ljubljana	26	N/A	N/A
Sosnowiec	29	N/A	N/A
Total	113		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

7.10.2. Participants' feedback on the Stakeholder Dialogue Workshops

Here we present the feedback given by those taking part in the Stakeholder Workshops. A total of 64 surveys were collected and its analysis is presented below.

Table 29: Stakeholder Dialogue Workshops evaluation data across all cities

	Stakeholders Dialogue Workshops		
	Total number of feedback	Male/Female (%)	Most common age group
Amsterdam	11	45/55	51-65 (45%)
Aveiro	12	42/58	40-49 (42%)
Bristol	13	69/23	37-50 (31%) and 51-65 (31%)
Liguria	5	60/40	51-65 (80%)
Ljubljana	N/A	N/A	N/A
Sosnowiec	23	61/39	37-50 (39%)
Total	64		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

ClairCity received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 68928.

Stakeholder workshops were conducted in all six cities and regions. Evaluation data was collected in all areas except Ljubljana. The following analysis responds to the five areas where evaluation data was collected: Amsterdam, Aveiro Region, Bristol, Liguria and Sosnowiec.

A total of 65 surveys were completed across five areas, over a third of them in Sosnowiec. Of all evaluation respondents, 55% were male (n=36), 42% female (n=27) and two people did not share their gender. In the average across all five areas participants tended to be older, with 61% of participants aged 51 or above.

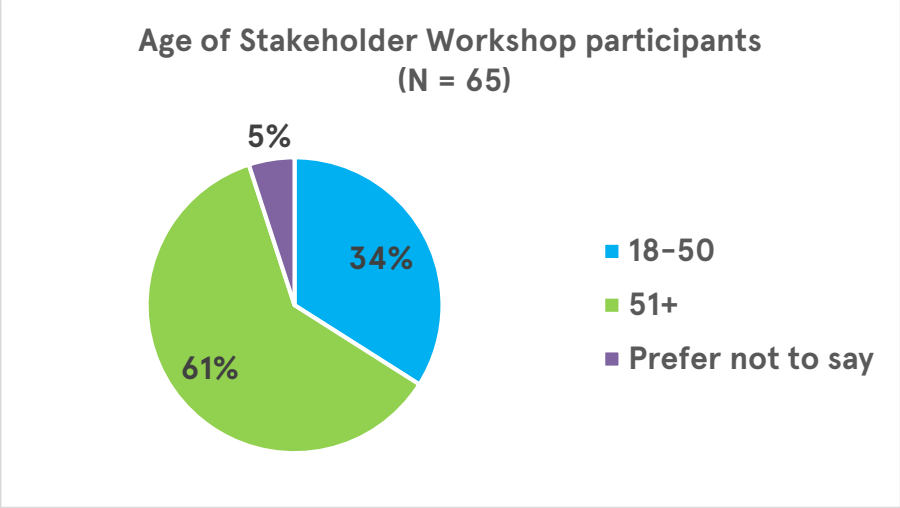

Figure 69: Stakeholder Dialogue Workshop participants age

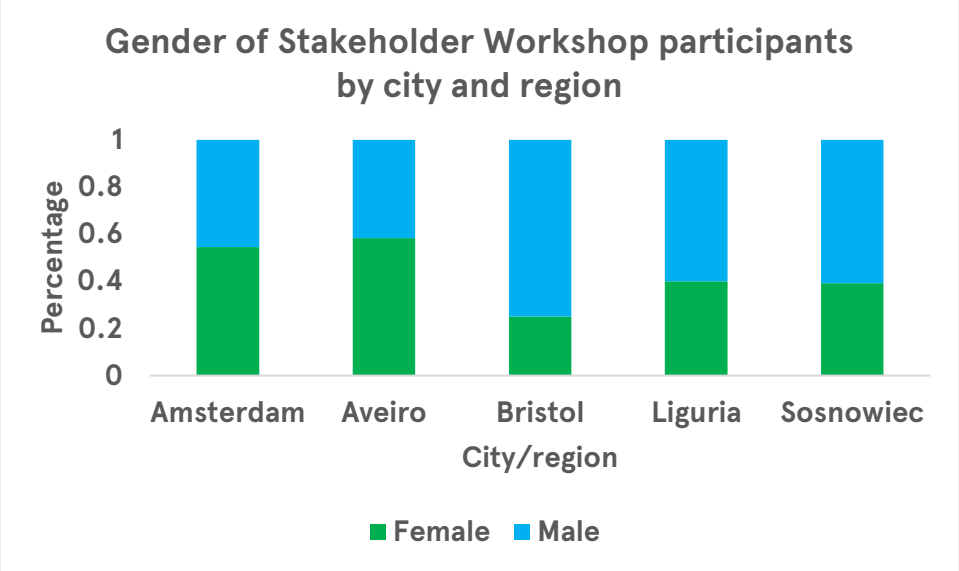

Figure 70: Gender of Stakeholder Workshop participants by city and region

ClairCity received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 68928.

While overall the stakeholder dialogue workshops skewed more male, both Aveiro (55%) and Amsterdam (58%) had a higher proportion of female than male participants. Bristol had the most male-dominated workshops, where 75% of participants were male.

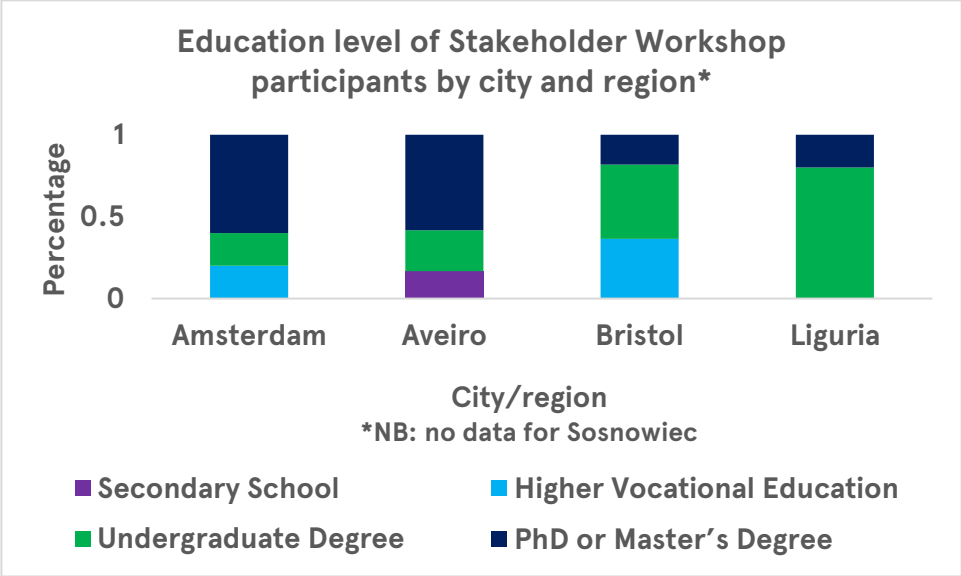

Figure 71: Stakeholder Workshop participants education level by city and region

In both Aveiro (58%) and Amsterdam (60%), the majority of workshop participants had postgraduate degrees. This skew towards more highly educated participants in the two cities may have skewed the overall education level distribution, which broken down by city/region shows that Liguria (20%) and Bristol (18%) had more modest numbers of participants educated to postgraduate level. Interestingly, while in general the participants in Aveiro were highly educated, it was the only city to report having participants whose highest level of education was secondary school (17%).

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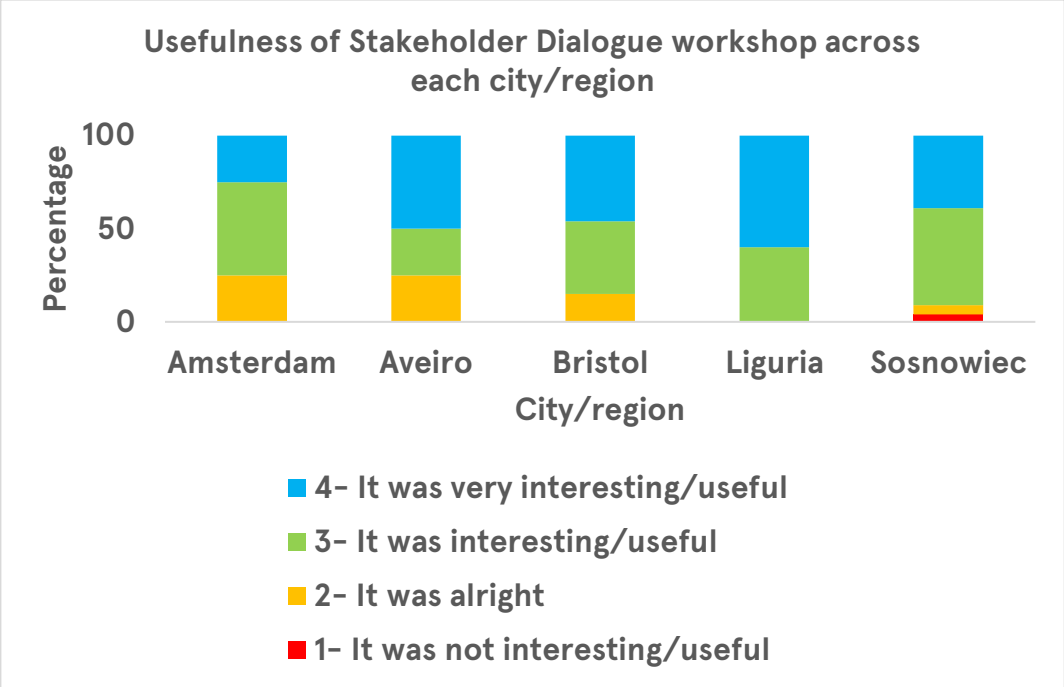

Figure 72: Stakeholder Workshop usefulness by city and region

Participants overwhelmingly found the stakeholder dialogue workshops interesting or useful, more so in Liguria (100%) than in any other city/region. Aveiro and Amsterdam were the cities where participants felt most ambivalent about the workshops (both 25%), while Sosnowiec was the only city where participants did not find the workshops useful (4%; 1 participant).

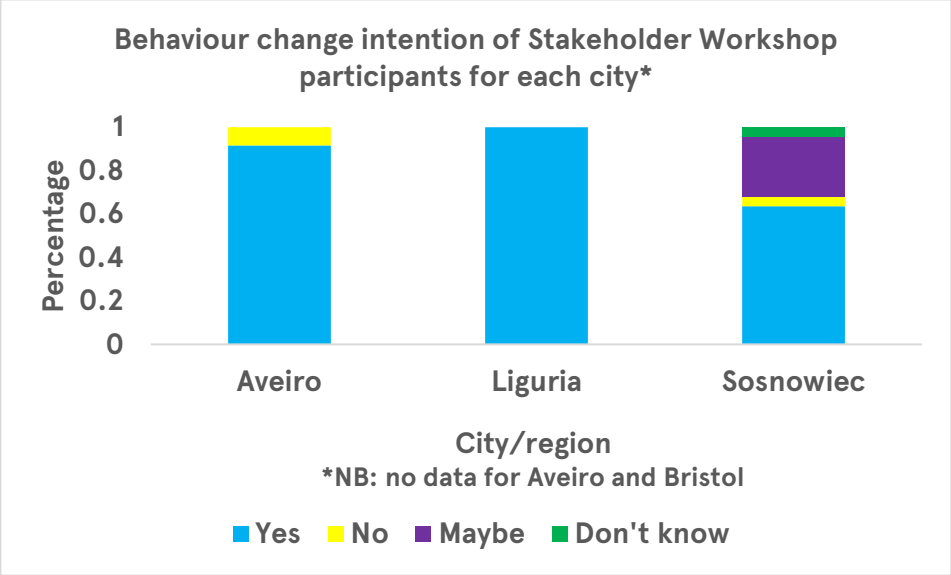

Figure 73: Stakeholder Workshop participants willingness to change by city & region

100% of respondents from Liguria said they intended to change their behaviour, compared to 92% in Aveiro and 64% in Sosnowiec.

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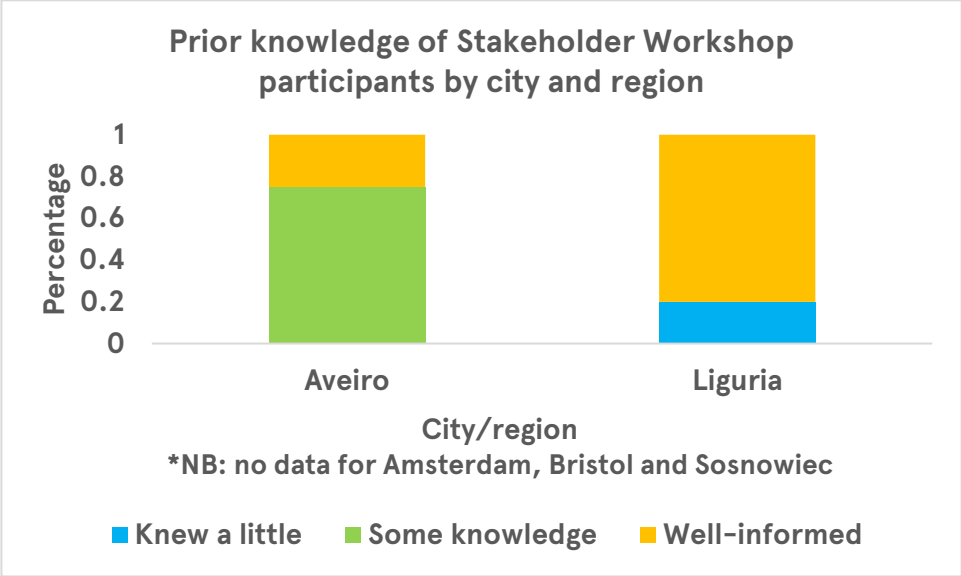

Figure 74: Prior knowledge of Stakeholder Workshop participants by city and region

Stakeholder workshop participants in Liguria were split between 80% who felt well informed before the workshop, compared to 20% who felt they only had a little knowledge. In comparison 75% of participants in Aveiro felt they had some prior knowledge before the workshop, and only 25% felt they were well-informed before the workshop.

Table 30: Stakeholder Dialogue Workshop engagement tool summary

What Worked Well	What did not work so well	How to do it better
Allowed for in-depth discussion and the co-creation of policy solutions.	**Requires careful facilitation.**	**Piloting any activity in advance to resolve possible issues or questions that may arise for facilitators.**
	Involves data collection of handwritten materials and photos.	**Deciding in advance what data you need to collect and designing activities that will give most precise access to this information.**
	Time, location and access to the location will affect the type of people who are interested or able to participate.	**Organising the workshop setting with input from target audience to make sure it appeals to them.**

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7.11. Policy Workshops

7.11.1. Participant characteristics

Here we present participant characteristics regarding those who engaged in the Policy Workshops. A total of 82 people engaged and the analysis is presented below.

Table 31: Policy Workshops engagement data across all cities

	Policy workshops		
	Total number of participants	Male/Female (%)	Most popular age range
Amsterdam	6	50/50	not collected
Aveiro	6	50/50	not collected
Bristol	18	56/44	not collected
Liguria	20	45/55	not collected
Ljubljana	12	42/58	not collected
Sosnowiec	20	30/70	not collected
Total	82		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

In total, the Policy Workshops across ClairCity case studies have mobilised 82 participants of which 46 male and 36 female. The composition of participants varied in each city / region but everywhere a balanced mix of relevant policy advisors, councillors, and municipal departments gathered together (please refer to the participants sections in the city-by-city chapters below for further detail). A headcount of people per expertise / topic is not provided as several participants covered many areas. Politicians (councillors) only attended the workshops of Bristol and Ljubljana.

7.11.1. Participants' feedback on the Policy Workshops

Here we present the feedback given by those taking part in the Policy Workshops. A total of 44 surveys were collected and the analysis is presented below.

Policy workshops were conducted in all six cities and regions. Evaluation forms were completed by some participants in four areas (Bristol and Ljubljana did not carry out evaluation).

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Table 32: Policy Workshops evaluation data across all cities

	Policy workshops		
	Total number of feedback	Male/Female (%)	Most popular age group
Amsterdam	3	0/100	37-50 (33%) and 51-65 (33%)
Aveiro	6	50/50	37-50 (67%)
Bristol	N/A	N/A	N/A
Liguria	16	44/66	N/A
Ljubljana	N/A	N/A	N/A
Sosnowiec	19	68/32	30-49 (64%)
Total	44		

Note: percentages may not sum to 100% as some people selected 'Other' or 'Prefer not to say'.

The gender of evaluation participants was fairly evenly split overall with 52% male and 48% female. Due to the different age ranges used to collect age data in different cities/regions, it is not possible to calculate an overall age distribution. Overall, the policy workshop participants were very highly educated, with 67% holding a postgraduate qualification.

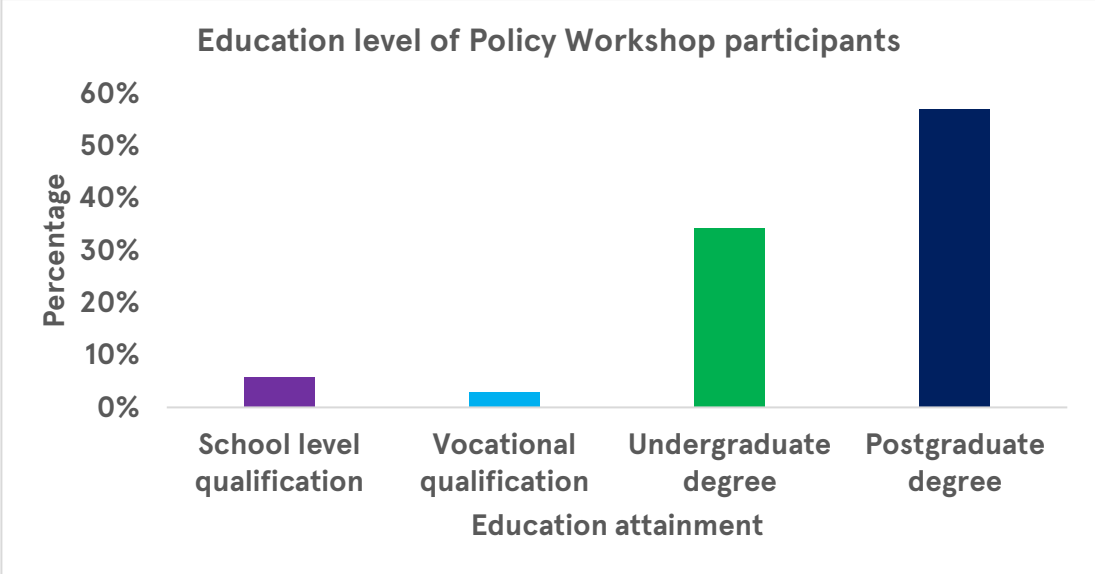

Figure 75: Education level of Policy Workshop participants

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Figure 76: Usefulness of Policy Workshop

Overall, the overwhelming majority (98%) of participants found the policy workshops interesting or useful. In Amsterdam and Aveiro, participants also rated individual sections of the workshops, including the scenario presentation and the work session, shown in the following graphs. Matching the overall trend, the overwhelming majority of participants found the scenario presentation (78%) and the work session (88%) interesting or useful, with the work session being rated more highly than the scenario presentation.

Participants credited the workshop for being professional and interesting, although this varied across cities/regions (Figure 77) Of particular benefit to participants were being able to "hear about aspects I'm less aware about", "resolution of important problems", and "sharing political decision-making among all municipalities with citizens' objectives". The few negative comments mentioned that the introduction to the workshop was "slow and not fully clear", and that "there were relatively few expertise areas around the table". One participant criticised the questionnaire options presented in the inhabitants' poll for being too extreme, meaning they did not allow for the answers to be balanced. Many comments offered suggestions on how to improve the policy workshops, summarised as follows:

1. **Involving or engaging more people (n=8):**
    a. Other air quality colleagues (1)
    b. Citizens' associations (1)
    c. Residents (1)
    d. Young people (1)

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e. Different social groups (1)
f. Covering a larger geographical area (1)
g. Holding more workshops (1)
h. Holding other meetings and discussions (1)

2. **Practical concerns (n=4):**
    a. Better timekeeping (3)
    b. More space for discussion (1)
3. **Education (n=4):**
    a. Of residents (1)
    b. Of young children (2)
4. **Improved communication and dissemination (n=5):**
    a. Using social media/internet (1)
    b. Publicising workshop results (1)
    c. Promoting the game (1)
    d. Highlighting financial results (1)
5. **Workshop content (n=2):**
    a. Clarifying the links between ClairCity and municipal strategy (1)
    b. Doing a cost-benefit analysis (1)

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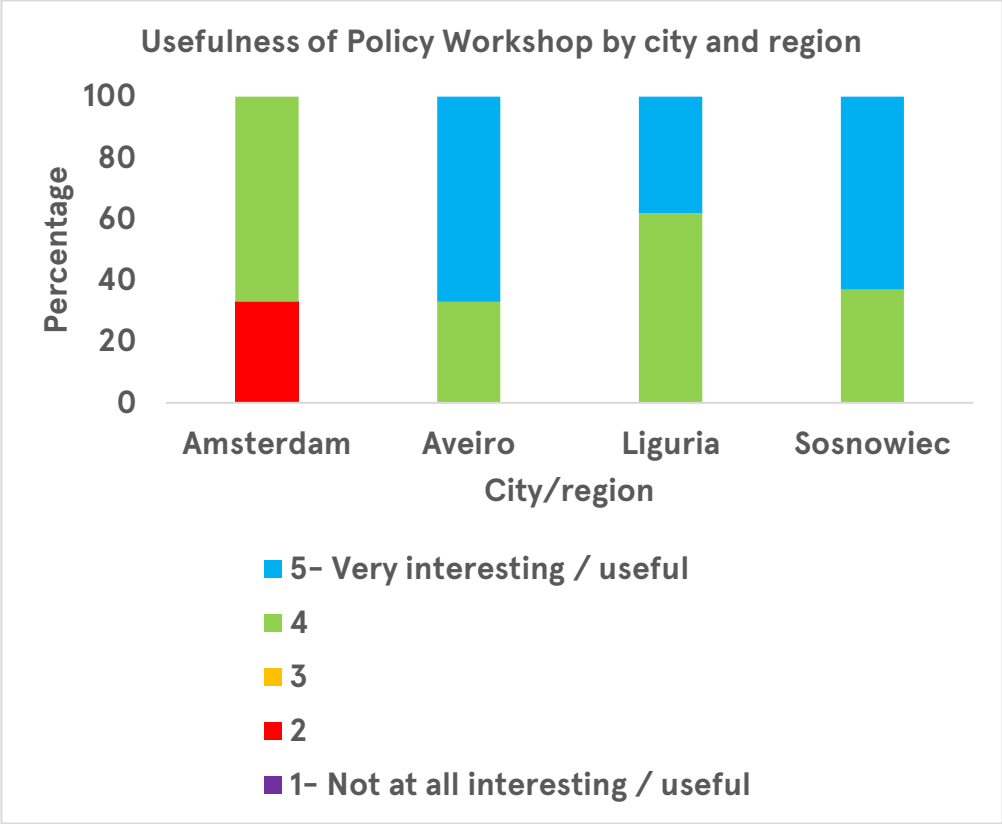

Figure 77: Policy Workshop overall reaction by city and region

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Table 33: Policy Workshops engagement tool summary

The policy workshops worked well to provide context to the views of citizens and stakeholders. They showed a varied picture of what is possible and what is not possible to implement, what are main barriers for implementation, and what are main enabling factors from a policy point of view. As such, the policy workshops were essential to connect citizens desires on how they want to live, work and travel in the future with practical implementation possibilities and limitations from policy makers' perspectives in each city. The policy workshops also showed that in some cities policy makers' ambitions were well aligned with citizens' ideas, in other cities less so.

The 'closed' design of the workshop itself worked well to structure the discussions and to provide tangible outputs, while at the same time offering ample opportunity for policy makers to mention all practical implementation barriers and enabling factors they encountered in their every-day work. Also, the carefully designed sequence – Stakeholder Dialogue Workshop (SDW) via Policy Workshops (PW) towards quantified inputs for the 'Unified Policy Scenario' (UPS) – worked well. Funnelling of citizens' policy choices into concrete inputs for the policy workshops proved useful. However, in some cities the final inputs for the UPS that emerged from the policy workshops were still rather qualitative, which sometimes made UPS calculations difficult.

The internal process within ClairCity to design the funnelling process from SDW via PW to UPS inputs proved difficult and required a lot of coordination. The main challenge was to find the right balance between allowing citizens to give all their opinions freely and to channel these inputs into feasible inputs for the scenarios through a 'reality check' done in the Policy Workshops. However, the overall process worked very well and could be repeated in future cities. With internal coordination between ClairCity partners now optimised, in the future the process steps in the sequence could be more easily repeated and in less time. In addition, ideally, all policy workshops would have to be facilitated by the same person in order to allow for the same workshop structure and sequence of events to be applied in all cities.

What Worked Well	What did not work so well	How to do it better
The combined 'closed' and 'open' design of tie workshops allowed for in-depth discussion, identification of all practical policy enabling factors and barriers and quantifiable inputs for the scenarios.	**Requires careful facilitation, ideally by the same person in all cities.**	**Allow for more time between policy workshops in different cities, which now effectively prohibited on-site facilitation by one coordinator.**

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Providing policy makers with a limited number of options to choose from helped to structure the workshops and to provide tangible outcomes for the scenarios.	**Involves data preparation of handwritten materials, which showed to be time intensive in ClairCity.**	**Now that the process structure has been decided and carried out in practice, it can be repeated much easier and quicker in the future. No fundamental adaptations to the process that was carried out in all cities showed necessary.**
Participation by policy makers was sometimes satisfactory and in other cities limited.	**In all cities a variety of policy makers was engaged from different policy areas. In some cities, also politicians were involved. Whether or not the participation of politicians in the process contributed or inhibited the discussion did not become clear.**	**Time, location and access to the location will affect the type of people who are interested or able to participate. Also, more and better internal advertising the importance of the workshops and the whole ClairCity process to policy makers in a particular city would be needed. More test runs in different cities with and without politicians would give a better view on if their participation is helpful or not.**

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7.12. ClairCity Project Staff interviews

7.12.1. Participant characteristics

ClairCity consortium staff who were involved in the implementation of the engagement activities were interviewed about their experiences on the project. A total of 27 in-depth semi-structured interviews took place, at two timepoints:

- Halfway through the project (Month 24 – April 2018), 12 interviews.
- During the last six months of the project (Months 42-48 – October 2019 – March 2020), 15 interviews.

In total 14 different members of staff took part in the interviews, across all cities/regions. Most cities took part in both interview rounds, with only one city (Sosnowiec) taking part in just one round.

Most staff interviewed were female (64%, n= 9). Regarding positions within the project team, 57% (n= 8) of those interviewed were Buddies and 43% (n= 6) were City partners.

Table 34: Full details of ClairCity staff taking part in the interviews

City	Position	Gender	Round 1	Round 2
Amsterdam	Buddy	Female	Yes	Yes
Amsterdam	City	Male	Yes	Yes
Amsterdam	Buddy	Male	Yes	Yes
Aveiro	Buddy	Female	Yes	Yes
Aveiro	Buddy	Female	Yes	Yes
Aveiro	City	Female	Yes	Yes
Bristol	City	Male	Yes	Yes
Bristol	Buddy	Female	Yes	Yes
Bristol	Buddy	Male	Yes	Yes
Liguria	Buddy	Male	Yes	Yes
Liguria	City	Female	Yes	Yes
Ljubljana	Buddy	Female	Yes	Yes
Sosnowiec	City	Female	No	Yes
Sosnowiec	City	Female	No	Yes

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7.12.2. ClairCity Staff feedback

Table 35**Error! Reference source not found.** presents the highlights (what worked well), challenges (what did not work so well) and any learnings that occurred, from the perspective of ClairCity staff. This analysis is presented by city/region.

Table 35: Main highlights, challenges and learnings, according to ClairCity staff

City	What worked well	Challenges	Learnings
Amsterdam	**Face to face engagement: "I think when you bring people together that's the best way".** **Mutual Learning Workshop due to being very specific (specific purpose and specific people invited/participating).** **Delphi questionnaire since it reached a large number of people.**	**Mobilising/recruiting people was hard work, particularly in big cities, where there are lots of other events happening, competing for citizen's attention and participation.** **Recruiting non-specialists was particularly challenging.** **Video competition was difficult to manage and to attract participants.** **Social media.** **GreenANTS app.**	**Increased awareness and knowledge on how to recruit participants.** **Increased awareness on Ethics requirements and Ethics compliance.** **"We learned everything, we had never engaged with the public before."** **"It's good to be on the street and to talk with people and to hear the voices that you normally don't hear. We have to do that, even if it's small numbers, it gives you a different insight than what you would get with a standard questionnaire."**
Aveiro	**Stage 3 of the Delphi.** **Online surveys.** **All workshops: stakeholders, policymaking, Mutual Learning Workshops.**	**Initially, approaching people on the streets was very challenging as the team had no experience in doing this.**	**Increased awareness of engagement skills: charisma, clear communication, type of language, etc.** **Training and knowledge in science communication are crucial.**

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		Recruiting stakeholders for the MLW was difficult due to availability. **Lack of knowledge and experience in social sciences, in particular methodologies, was a challenge.** **Timing the engagement tools correctly: for instance the school competition.**	**Increased knowledge and confidence in adapting language to suit the audience.**
Bristol	**Delphi process** **Working with science communication experts.** **Face to face engagement with citizens.** **Relationship between local council and UWE.**	**Not been as wide reaching as thought.** **GreenANTS app.** **Policy workshops attracted the usual suspects rather than a wider audience.**	**Increased awareness, knowledge and confidence in communicating and engaging with citizens: "Listen to people, simplify and adapt you message to your intended audience** **When engaging with citizens, "Be less scientist, be more human"** **Increased awareness of the importance and value of two-way communication: "Listen to other people's perspective, listen to other people's ideas, take time to reflect on**

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			them and it's the same with the public." **"How much I have enjoyed engaging with the public".**
Liguria	**Social media engagement.** **Public meetings with citizens.** **School competition.**	**Recruiting for Delphi (especially the questionnaire)** **Skylines game.**	**Increased knowledge and confidence on how to engage with citizens. In particular, the importance of the language used.** **Increased awareness of the importance of project evaluation.** **Citizens are not aware of their city's issues, such as air pollution. They do not think it is a problem.**
Ljubljana	**Delphi workshops** **Linking ClairCity activities with other ongoing activities was a successful strategy.**	**Low number of participants.** **Delphi with citizens, low participation.**	**Citizens are not aware of their city's issues, such as air pollution. They do not think it is a problem.**
Sosnowiec	**Skylines game.** **Face-to-face workshops.**	**Delphi process.** **GreenANTS app. Citizens do not want to be tracked**	**Increased knowledge on how to get local partners on board.** **Increased knowledge on methods on engaging with the public.** **"It showed me how to successfully involve residents in activities for common good."**

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8. Overall Comparisons

8.1. Overall Evaluation Findings

The overall evaluation sample of 855 participants was analysed for skew and found to tend towards a normal distribution (0.83), and so parametric statistical tests were conducted when the construct had scalar values. Different activities were evaluated in different ways, as appropriate for their mode of engagement; this means that not all activities were asked the same questions. When the questions were the same, their outputs have been compared.

Table 36: Statistical analysis of engagements

	Enjoyment	Useful	Understanding	Behaviour
N	731	62	733	755
Mean	3.7	4.2	3.4	N/A
Mode	5	4	3	2
Std. Deviation	1.1	1.0	1.1	.5
Range	4	4	4	2
Minimum	1	1	1	1
Maximum	5	5	5	3

8.1.1. Enjoyment

Overall, 731 participants were asked if they enjoyed the activity, and the mean value was 3.7 out of 5 (SD=1.1), indicating that there was a high level of enjoyment. The activities which achieved the highest enjoyment scores were the Delphi workshops and videos, with 91% and 90% (respectively) of participants either enjoying or really enjoying the activity (Figure 78). Of the game participants, 55% indicated that they enjoyed or really enjoyed the activity. The GreenANTS app was the least liked by its participants, with 53% of participants indicating that they disliked it.

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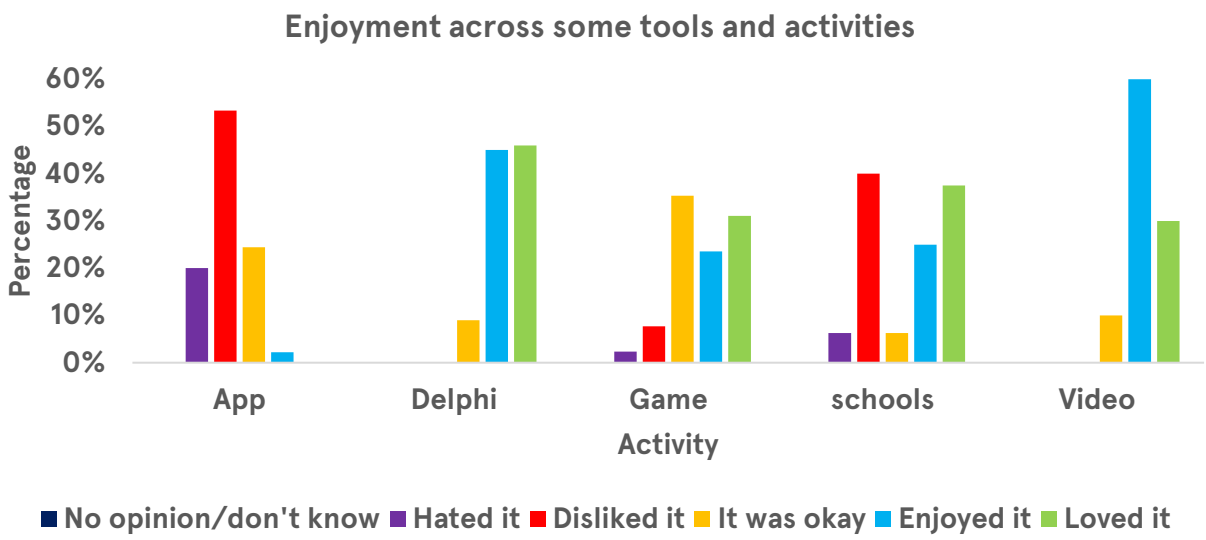

Figure 78: Comparison of enjoyment across some tools and activities

There were no statistically significant differences in the enjoyment levels between men and women. However, a Kruskall-Wallis test showed that there were highly statistically significant differences at the $p<.05$ level between how different age groups enjoyed engaging with ClairCity activities [$H(5) = 28.49$, $p<.000$]. This is probably due to the types of activities the younger and older participants participated in; participants in the 16-24 and 25-34 year old brackets were more likely to say that some hated the activities, and some loved them.

A Spearman correlation coefficient was computed to assess the relationship between participants' age and their enjoyment of the activities. There was a negative correlation between the two variables ($r_s(97) = -.311$, $p=.002$) i.e. the younger the participants, the more likely they were to say that they enjoyed the activity.

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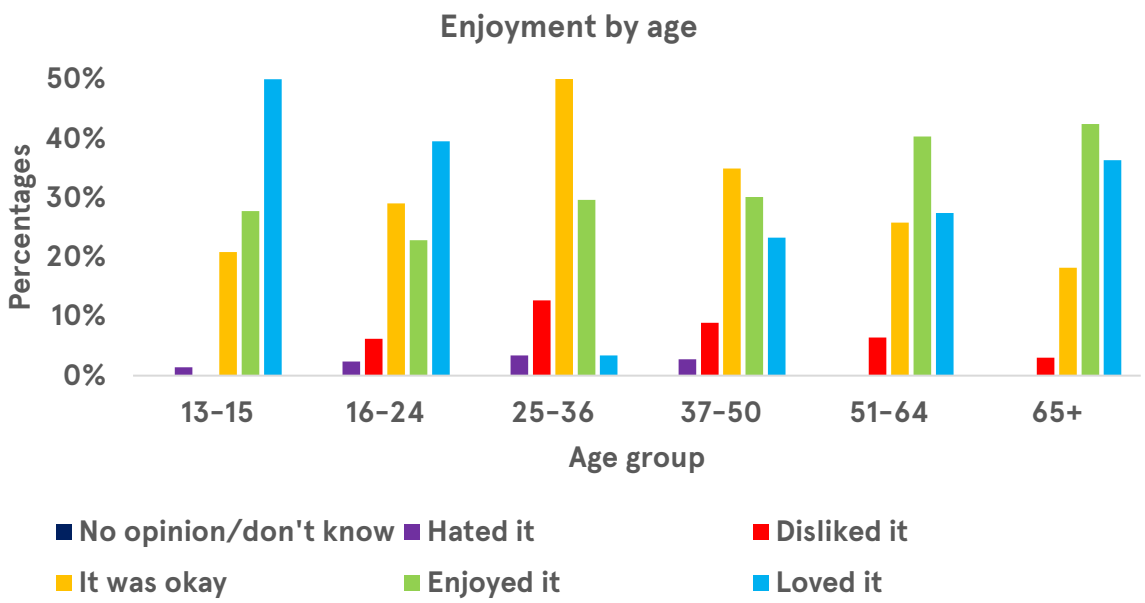

Figure 79: Comparison of enjoyment by age

8.1.2. Usefulness

The policy workshop and schools engagement participants (*N*=62) were asked if the activities were useful for their work. The mean score was 4.2 (*SD*=1.0), indicating that these activities were useful. 98% of participants in the policy evaluation found the workshops useful or really useful, while 61% of schools activity evaluators found them to be useful or really useful.

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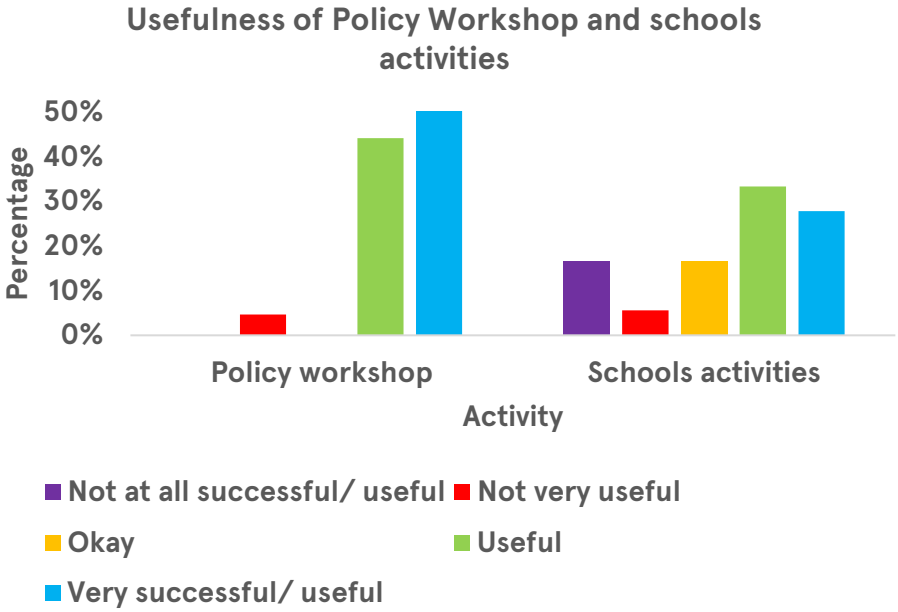

Figure 80: Comparison of usefulness of policy and school activities for participants

8.1.3. Understanding

The GreenANTS app, Delphi, Skylines game and stakeholder workshop evaluation participants (*N*=733) were asked if their understanding of air pollution, carbon emissions and health impacts had changed after participating in the activity. The mean score was 3.4 out of 5 (*SD*=1.1), which indicates that their knowledge had largely stayed the same. This is due to large numbers of game participants rating their understanding as staying the same (45%), with most coming into the game with little expertise in air quality. This may be a result of the game asking participants to run the city straight away and not focussing on explaining these issues. The Delphi was rated the most highly for improving understanding (62%) of air quality.

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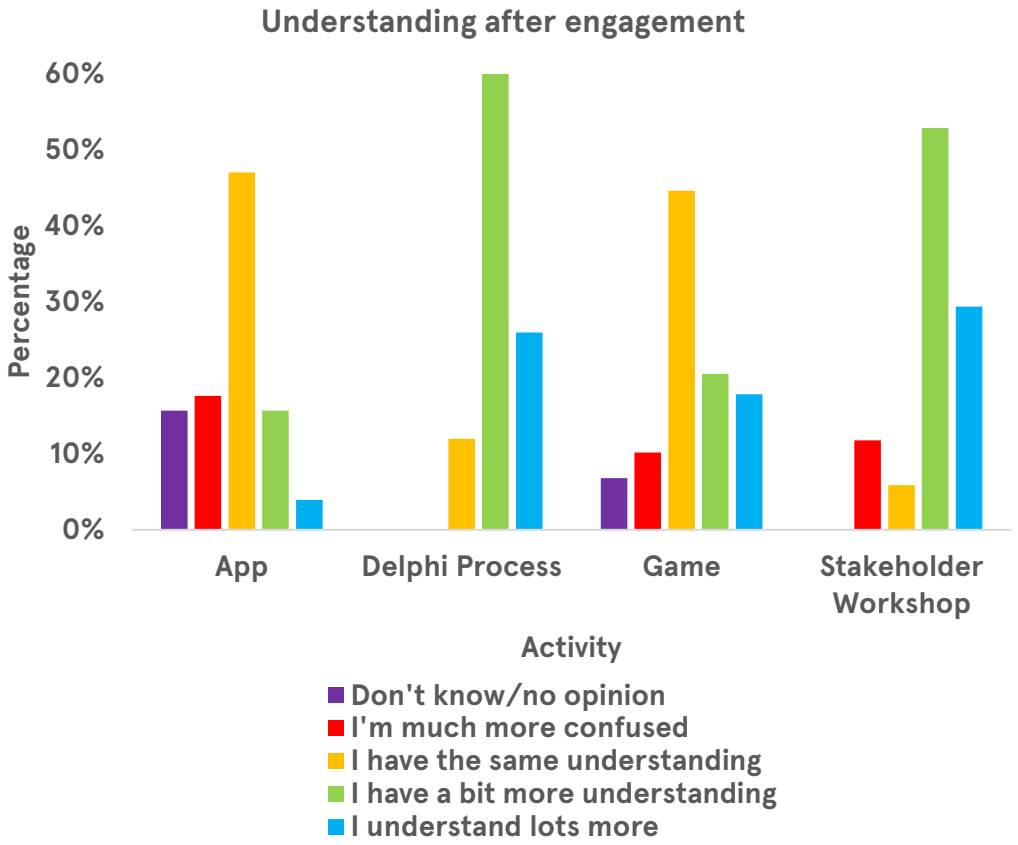

Figure 81: Comparison of understanding across some tools and activities

There were no statistically significant differences in how men and women rated each activity for understanding. However, a Kruskall-Wallis test showed that there were highly statistically significant differences at the $p<.05$ level between how different age groups rated their understanding following ClairCity activities [$H(5) = 38.96$, $p<.000$]. This is probably due to the types of activities the younger and older participants participated in; participants in the 16-24 and 25-34 year old brackets were more likely to say that their understanding stayed the same.

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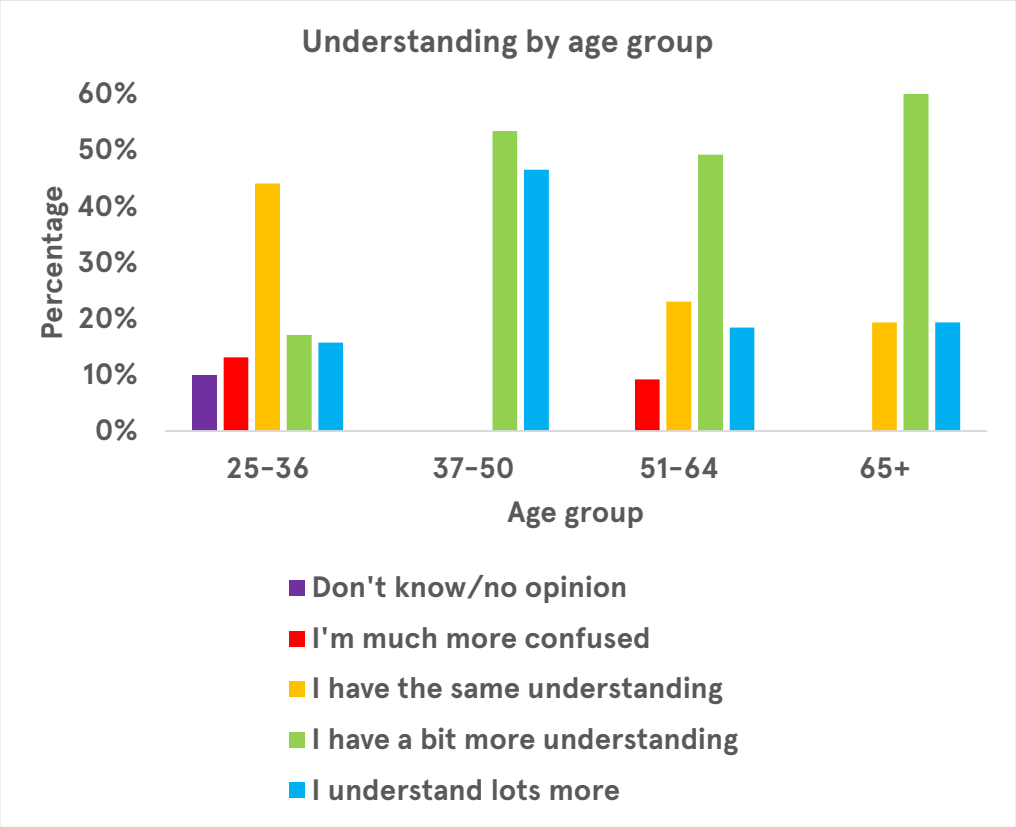

Figure 82: Comparison of understanding by age group

A Pearson product-moment correlation coefficient was computed to assess the relationship between participants' enjoyment of the activities and their subsequent understanding of air quality. There was a positive correlation between the two variables [r = .587, n =705, p < .000], i.e. the more participants enjoyed the activity, the more they reported that their understanding of air quality had improved.

8.1.4. Behaviour

Evaluation participants (*N*=755) were asked if they would do anything differently to improve air quality after participating in the activities. Overall, 74% of participants said that they would make a change. The Stakeholder workshop and the Game had the most impact on participants, with 79% and 80% (respectively) of participants saying that yes they would make a change.

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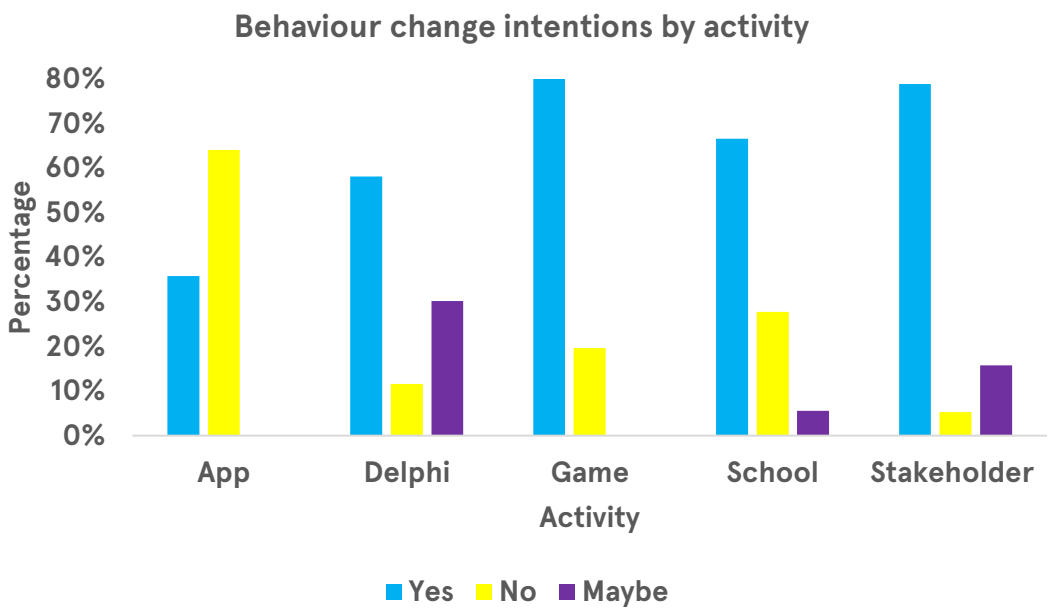

Figure 83: Behaviour change intention comparison across some tools and activities

The city with the highest ratio of people who said they would make changes was Liguria, while the lowest intentions were in Amsterdam (Table 37). A Kruskall-Wallis test showed that there were highly statistically significant differences at the p<.05 level between how different cities rated their intentions to change their behaviour following ClairCity activities [H(6)= 26.98, p<.000]. This may be because people in Amsterdam are already living relatively green lives and feel they have fewer changes to make.

Table 37: Behaviour change intention in each city

	Behaviour change intention			
	Yes	No	Maybe	Yes/No ratio
Aveiro	101	22	4	4.59
Amsterdam	51	35	1	1.46
Bristol	50	15	5	3.33
Liguria	35	6	7	5.83
Ljubljana	4	1	0	4.00
Sosnowiec	247	67	16	3.69
Worldwide	72	14	0	5.14

There were no statistically significant differences in how men and women rated each activity for behaviour change. However, a Kruskall-Wallis test showed that there were highly statistically significant differences at the p<.05 level between how different age groups rated their intentions to change their behaviour following ClairCity activities [H(5)= 27.64, p<.000].

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This does not seem to be related to the types of activities that the participants took part in, and is probably more related to the perceived capacity people have to take action at different life stages. Young people (13-15 and 16-24) and older people (55-64) had a higher ratio of yes/no answers (higher intentions to change), with the lowest ratio being in the 25-34 year old age bracket (Figure 84).

Table 38: Behaviour change intention across age groups

	Behaviour change			
Age	No	Yes	Maybe	Yes/No proportion
13-15	7	65	0	9.29
16-24	33	173	4	5.24
25-34	41	111	3	2.71
35-44	28	119	6	4.25
45-54	14	49	10	3.50
55-64	3	24	10	8.00

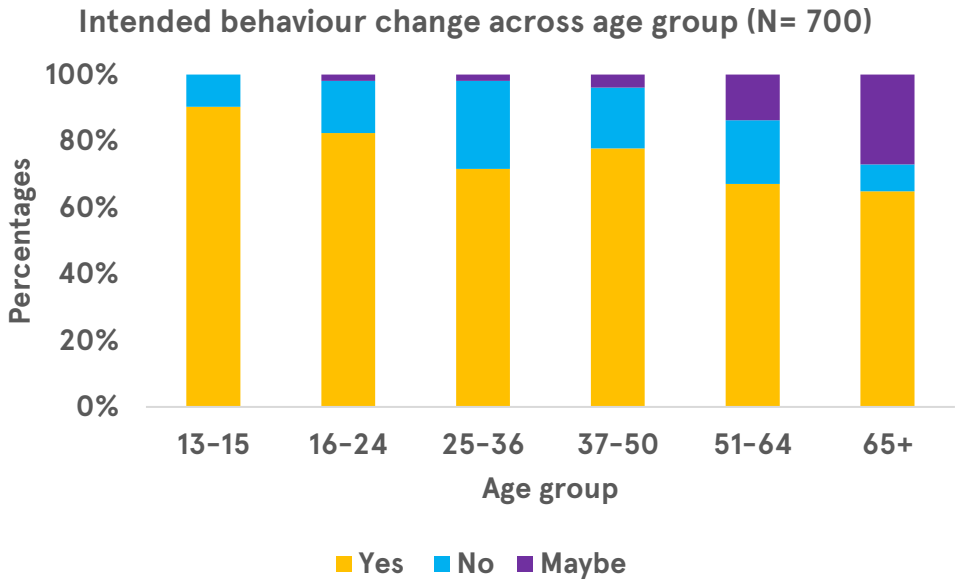

Figure 84 Intended behaviour change across age groups

A Spearman correlation coefficient was computed to assess the relationship between participants' education level and their intentions to change their behaviour. There was a negative correlation between the two variables [rs(123) = -.253, p=.005] i.e. the less educated the participants, the more likely they were to say they were going to change their behaviour.

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A Spearman correlation coefficient was computed to assess the relationship between participants' understanding of air quality following the activities and their intentions to change their behaviour. There was a positive correlation between the two variables [$r_s(716) = .401$, $p<.000$] i.e. the more participants reported that their understanding had improved, the more likely they were to say they were going to change their behaviour.

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8.2. Which engagement tool was most successful in each city/region?

While the engagement activities were not a competition, this graphic indicates which engagement tool worked best in each city.

Figure 85: Most successful engagement tool in each city

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The different engagement tools worked variably in each city, and Table 39 presents some suggestions from staff interviews about why this maybe so.

Table 39: Analysis of successful approaches for each engagement tool

Engagement tool	Most successful in the city/region	Why?
Delphi	Aveiro (1349 participants)	The Aveiro region consists of 11 municipalities and so was able to recruit through each regional council.
Skylines Game	Sosnowiec (949 participants)	Sosnowiec used the free Council advertising network through bus stops to advertise, a very successful recruitment strategy.
GreenANTS App	Amsterdam (36 participants)	Amsterdam connected to health officials through the city council.
Mutual Learning Workshop	Liguria (37 participants)	Liguria consists of a wider region and so was able to recruit representatives from across the wide area.
Schools Competition	Liguria (130 participants)	The Italian school curriculum aligned with the competition ethos
My City videos	Aveiro (26 participants)	Aveiro worked with community centres from across its regional municipalities to develop the videos. This meant the senior citizens felt supported and encouraged to participate.
Stakeholders Workshops	Sosnowiec (29 participants)	Sosnowiec city council recruited many city stakeholders who wanted to change the region through ClairCity engagement.
Policy Workshops	Liguria and Sosnowiec (20 participants each)	Sosnowiec and Liguria councils were well connected to city policymakers.

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9. Conclusion

A total of 8302 people from ClairCity cities/regions directly engaged with the project over its duration. In addition, there were 103,494 views of the project website, and over 770,000 social media impressions. Overall, the project more than met its engagement targets.

The evaluation of our engagement activities attracted 855 participants. More males (63%) than females participated in the evaluation due to the most popular engagement activity being the game (N=534), with a high level of male players. The game also appealed to a younger audience than other activities, meaning that overall, 25% of evaluators were aged 16-25 years old. However, different activities appealed to different ages of people, and so all age categories are represented in the project. For instance, the workshop activities (Delphi, policy, and stakeholder workshops) attracted 66% of people in the age category of 45-54 year olds and 83% of 55-64 year olds.

Overall, participants tended to enjoy the activities in which they took part; the younger the participants, the more likely they were to say that they enjoyed the activity. The activities also had an impact, with 74% of participants saying that they would now make a change to their lives to improve air quality. The more participants enjoyed the activity, the more they reported that their understanding of air quality had improved. Similarly, the more participants reported that their understanding had improved, the more they reported that they would change their behaviour. Younger people and those with lower education to start with more likely to say they would change their behaviour. All of these relationships were highly statistically significant.

To fully realise the goal of citizen-led air pollution reduction in cities, researchers and policymakers need to work hard to ensure engagement is reflective of city demographics. This evaluation shows the importance of designing engagement activities which appeal to a wide variety of audiences to ensure that a broad cross-section of society can participate in engagement with policymaking. The more enjoyable the engagement activities, the more people gain understanding about the issues, and the more likely people are to make a change to their behaviour to reduce air pollution and carbon emissions, and improve the health of our cities. We hope this evaluation report proves useful to other policymakers working towards a future with clean air.

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10. Appendices: Evaluation Toolkit

These guidelines were formatted and adapted for each country and event, but they provided a useful framework to begin the Evaluation process. All evaluation methodologies received full Ethics Approval in accordance with POP1 and POP3 Ethics Framework D8.1 and D8.2.

10.1. Guidance for online surveys

This document will help and assist ClairCity staff and/or City Partners involved in collecting evaluation data using online surveys.

Guidance for online surveys:

1. These events involve pre-booking, where email addresses need to be collected. Please make sure you **keep all the email addresses** and update the list if you have new attendants or drop outs.
2. Towards the end of the event, before goodbyes, make sure you mention that each delegate will receive an email containing a link to a short online survey.
3. Highlight how important it is that we get feedback from them: "*It is really important for the ClairCity team to hear your opinions and views about today's event*".
4. Make sure you mention the online survey is quick and simple to complete: "*The online survey will take no more than 10 minutes to complete and questions are simple and straightforward. Please make sure you complete the online survey, we would be very grateful".*
5. Soon after the event (ideally the next day) send an email to each delegate with the following text, translated into your native language:

> *Dear delegate,*
> *Thank you for participating in the [EVENT'S NAME].*
>
> *We would like to invite you to complete a short online survey. The information gathered from this survey will form an important contribution to the evaluation of the ClairCity project. Your feedback and comments are very important to us and we would greatly appreciate if you could spare approximately 10 minutes to complete this online survey:*
>
> *[LINK TO SURVEY].*
>
> *The evaluation is being carried out by researchers from the Science Communication Unit at the University of the West of England, Bristol, UK. Any information gathered will be used only for the purposes of the evaluation report and academic publications, and all data will be anonymised, meaning you will not be personally identifiable.*
>
> *Thank you for your time.*
>
> *Best wishes, YOUR NAME*

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6. One week after the event send a reminder to all delegates with the following text, translated into your native language:

Dear delegate,
Thank you for participating in the [EVENT'S NAME] on the [DATE of EVENT].

If you haven't already, could you please fill in a short online survey, as this would help us to evaluate the project.

You can find the survey here [LINK TO SURVEY]; your answers are completely anonymous and it only takes 5-10 minutes to complete.

Thank you for your time.

Best wishes,
YOUR NAME

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10.2. Post-workshop online surveys

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Thank you for taking the time to complete this questionnaire. It should take around 5-10 minutes to complete, and will help us improve future events. Completing this questionnaire indicates that you give consent for this data to be used in this research study. All data will be treated anonymously and confidentially.

Section A: About the workshop:

1. How did you enjoy the workshop in general?

☐ Really enjoyed it

☐ Enjoyed it

☐ It was OK

☐ Didn't enjoy it

☐ Didn't enjoy it at all

Other comments:

2. Thinking about how much you know about air pollution and carbon emissions. Do you think you have the same level of knowledge about these topics as you did before the workshop?

☐ I know considerably more now
☐ I know a little bit more now
☐ My knowledge hasn't changed
☐ I feel more confused
☐ Don't know / no opinion

Section B: Post-workshop

3. Are you planning on doing something different to help reduce air pollution and/or reduce carbon emissions?

☐ Yes
☐ Maybe
☐ No

If **Yes** please give details:

If **No**, why not (please tick all that apply)?

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☐ I haven't thought about it
☐ There is nothing I could personally change
☐ It's too difficult to change
☐ It's up to our city leaders to take action

Section C: About you:

4. **What is your gender?**

☐ male ☐ female ☐ other

5. **What is your age?**

☐ under 18 ☐ 18-29 ☐ 30-39 ☐ 40-49 ☐ 50-59

☐ 60+

6. What is your highest level of education?

☐ School qualification

☐ University degree/ undergraduate degree

☐ Postgraduate degree (Masters, PhD, etc.)

☐ other:_____

7. What is your occupation? _____

8. Please indicate the name of the event you attended and the city where it took place: _____

Thank you.

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10.3. Online survey - Teachers

ClairCity Schools Activity Ethics and Survey

ClairCity needs to evaluate how effectively it has achieved its aims over the course of the project. In order to get information about the Schools Competition teacher participants and how they found taking part we need to collect demographic information, as well as asking them attitudinal questions.

School Competition Post-participation Survey
Following participation in the activity, teachers will be sent an email asking them to complete a review survey.

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Thank you for taking part in the ClairCity Schools Activity – My City, My School, My Home. We would like to evaluate your experience of the project through a short online questionnaire. Participation is voluntary.

The questionnaire will take about 10 minutes to complete. Data will be stored securely in accordance with the terms and conditions of the General Data Protection Regulation. Your answers will be anonymised and then grouped thematically with other respondents so they are not identifiable to you. Overall outcomes from the evaluation will be published in an evaluation report to the European Commission and communicated more widely where possible.

It is up to you to decide whether or not to take part. If you do decide to take part, please proceed and complete the online questionnaire. This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK researchethics@uwe.ac.uk.

1. **How did you enjoy working on the ClairCity schools activities?**

- ☐ Hated it
- ☐ Disliked it
- ☐ It was OK
- ☐ Liked it
- ☐ Loved it

Other comments: ☐

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2. How would you rate the following aspects of the ClairCity Schools Activities?

	1 Very Poor	2 Poor	3 OK	4 Good	5 Very good
General organisation					
Online tool design					
Questions asked of the children					
Measures discussed by the children					
Teaching materials provided					

Other comments:

3. How useful were the activities in supporting your teaching about air pollution, carbon emissions and health?

☐ Not at all useful
☐ Unuseful
☐ Neither unuseful or useful
☐ Useful
☐ Very useful

Please explain further:

4. How successful do you feel the activities were in achieving the following aims?

	1 Not at all successful	Unsuccessful	OK	Very successful	Very successful
Increasing your students' awareness and knowledge of air pollution, carbon emissions and health?					
Motivating your students to make changes to their daily lives to reduce air pollution and					

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carbon emissions?					
Motivating your students to take an interest in their city's issues around air pollution and carbon emissions?					

5. Are <u>you</u> planning on doing anything to reduce air pollution and/or reduce carbon emissions, as a result of participating in this ClairCity activity?

☐ Yes
☐ No

If **Yes** please select all that apply

I will walk or cycle more often
I will take public transport more often
I will choose a greener car
I will campaign for change
Other box

If **No**, why not?

☐ I haven't thought about it
☐ There is nothing I could personally change
☐ I feel it's too difficult to change
☐ It's up to local and national government to take action
☐ Other: _____

6. Are your <u>students</u> planning on doing anything to help reduce air pollutions and/or reduce carbon emissions, as a result of participating in this ClairCity activity?

☐ Yes
☐ No
☐ Don't know

Please give details:

Demographics

We need to collect information on the teachers and school's demographics.

Are you: Male Female Prefer not to say
Age (years): 18-24 25-34 35-49 50-64 65+
Teaching specialism:
School name:
City where school is located:

Thank you for your time.

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10.4. Pop-up survey for Skylines game

Ethics Consent

A 'tick box to proceed' option should be programmed into the game. This should include words to this effect:

I agree that by playing this game my choices will inform the ClairCity project about policymaking research into air pollution.

I confirm that I am over 16 years of age. If you are aged 13-16 years you can still play provided you have asked parental permission.

Embedded in entry information:

This game is about air pollution, carbon emissions and health in cities. How would you rate your knowledge about air pollution before playing the game:

☐ Expert
☐ Well-informed
☐ Knew a little
☐ No knowledge

Are you: ☐ Male ☐ Female ☐ Prefer not to say

Age (years): ☐ 13-15 (I have permission from my parents to play this game) ☐ 16-24 ☐ 25-34 ☐ 35-49 ☐ 50-64 ☐ 65+

Location: ☐ Bristol ☐ Aveiro Region ☐ Liguria Region ☐ Sosnowiec ☐ Amsterdam ☐ Ljubljana ☐ Other city (please specify with open box)

Information on the About or Credits page of the game should include:

ClairCity is asking citizens how they want to work and live in the cities of the future, and based on that, investigating ways of providing more effective air pollution and climate change policies for a healthy city. The project also aims to raise awareness about air pollution, carbon emissions and health in our cities, looking at how we can all contribute towards solving the problems.

Six partner cities and regions will directly shape the project; they are Amsterdam in the Netherlands; Bristol in the UK; Ljubljana in Slovenia; Sosnowiec in Poland; the Aveiro region in Portugal and the Liguria region in Italy. Residents will get involved through an online game, app, city events, a schools competition, and local workshops. The end product of the project will be a tailored Policy Package for each city, detailing the potential solutions for a future with clean air.

We would like to find out what you see as the barriers and solutions to a future with clean air through playing this game. Your choices in playing the game will enable us to develop different futures for our cities. This will inform the development of the project and eventually contribute to the policy package.

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The personal information collected through this game will be processed by the ClairCity project in accordance with the terms and conditions of the EU General Data Protection Regulations. We will hold your data securely and not make it available to any third party unless permitted or required to do so by law. Your choices will be anonymised so they are not identifiable to you and will be grouped thematically with other game players.

Overall outcomes from the evaluation will be published in reports to the European Commission, on our website www.claircity.eu, and through wider media.

It is up to you to decide whether or not to play the game. By playing the game you are agreeing to us using your game choices in our research. This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK researchethics@uwe.ac.uk.

ClairCity Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689289.

Survey questions

1. *How much did you enjoy playing this game?*

(1 Hated it - 5 Loved it)

2. *Has this game improved your understanding of air pollution, carbon emissions and health in cities?*

(1 More confused - 5 More understanding)

3. *Do you think you will do anything to help reduce air pollution and/or carbon emissions now you have played the game?*

☐ Yes
(please select all that apply):

- I will walk or cycle more often
- I will take public transport more often
- I will choose a greener car
- I will campaign for change
- ☐ Other: _____

☐ No
(please select all that apply)

- ☐ I haven't thought about it
- ☐ There is nothing I could personally change
- ☐ I feel it's too difficult to change
- ☐ It's up to local and national government to take action
- ☐ Other: _____

ClairCity received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 68928.

10.5. Pop-up survey for GreenANTS App

Ethics Consent

A 'tick box to proceed' option should be programmed into the app. This should include words to this effect:

I agree that by using this app my choices will inform the ClairCity project about policymaking research into air pollution.
I understand data about my travel choices will be held under GDPR in the EU.
I confirm that I am over 16 years of age.

Information on the About or Credits page of the app should include:

ClairCity is asking citizens how they want to work and live in the cities of the future, and based on that, investigating ways of providing more effective air pollution and climate change policies for a healthy city. The project also aims to raise awareness about air pollution, carbon emissions and health in our cities, looking at how we can all contribute towards solving the problems.

Six partner cities and regions will directly shape the project; they are Amsterdam in the Netherlands; Bristol in the UK; Ljubljana in Slovenia; Sosnowiec in Poland; the Aveiro region in Portugal and the Liguria region in Italy. Residents will get involved through an online game, app, city events, a schools competition, and local workshops. The end product of the project will be a tailored Policy Package for each city, detailing the potential solutions for a future with clean air.

We would like to find out more about your travel choices and your reactions to change, through using this app.

The personal information collected through this app will be processed by the ClairCity project in accordance with the terms and conditions of the EU General Data Protection Regulation. We will hold your data securely and not make it available to any third party unless permitted or required to do so by law. Your choices will be anonymised so they are not identifiable to you and will be grouped thematically with other app users.

Overall outcomes from the evaluation will be published in reports to the European Commission, on our website www.claircity.eu, and through wider media.

It is up to you to decide whether or not to use the app. By using the app you are agreeing to us using your choices in our research. This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK researchethics@uwe.ac.uk.

ClairCity Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689289.

Research participation survey information

You are being invited to give your views on the ClairCity GreenAnt app, which aims to understand more about our travel choices and travel behaviour. This research study involves thousands of people in cities across Europe, enabling us all to decide the best local options for a future with clean air and lower carbon emissions.

We would like to evaluate your experience through a few questions, which will take no longer than 10 minutes to complete. This is anonymous and data will be stored securely.

This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK researchethics@uwe.ac.uk.

Thank you for your time.

Survey questions

1. **How often have you used the GreenAnt phone system?**

☐ Daily
☐ Some days a week
☐ Some days a month
☐ Just opened once
☐ Never

2. **How easy was it to use the app on your phone?**

☐ Really easy
☐ Easy
☐ It was okay
☐ Hard to use
☐ Really hard to use
☐ Don't know / no opinion

3. **Have you enjoyed using this app?**

☐ I loved it
☐ I liked it
☐ It was okay
☐ I disliked it
☐ I hated it
☐ Don't know / no opinion

4. **Do you have any further comments on how the app worked? If you encountered any issues please state which phone device you use.** (open free choice)

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10.6. Survey for My City video competition

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Thank you for taking part in this ClairCity activity. We would like to evaluate your experience of the project through a short questionnaire. Participation is voluntary.

The questionnaire will take about 5 minutes to complete. Data will be stored securely in accordance with the terms and conditions of the General Data Protection Regulation. Your answers will be anonymised and then grouped thematically with other respondents so they are not identifiable to you. Overall outcomes from the evaluation will be published in an evaluation report to the European Commission and communicated more widely where possible.

It is up to you to decide whether or not to take part. If you do decide to take part, please proceed and complete the questionnaire. This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK researchethics@uwe.ac.uk.

Section A: About the competition

1. **Why did you take part in the ClairCity videos?**
2. **Who did you hope would watch the video and what did you hope they would get from it?**
3. **Were you pleased with the experience?**

☐ Loved it
☐ Liked it
☐ Neither liked it or disliked it
☐ Disliked it
☐ Hated it

Please explain your answer: _____

4. **Did taking part achieve your expectations? Please explain your answer:**

_____

Section B: About you:

5. **What is your gender?**

☐ male ☐ female ☐ other

6. **What is your age?** _____

7. **Which city do you live in?** _____

Thank you

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10.7. Interviews with ClairCity Project team - Round 1

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Thank you very much for agreeing to participate in this interview. It won't take very long and I'd appreciate it if you could be as honest as possible regarding your views and thoughts about the ClairCity project. This is an opportunity to reflect on how the project is engaging and working with **the public.**

Thinking about your involvement:

1. Please describe your role in the project.

Thinking about working with the public:

2. In your opinion, what has worked well so far?

3. And what hasn't worked so well?

4. Please would you describe the sort of challenges that you have faced over the past two years when working with people?

5. Is there anything you would you have done differently to achieve your aims?

6. Have you learnt anything new from working with the public?

7. Did you use any new approaches compared to your ordinary work practices in order to involve people in ClairCity? Can you please give me some details about those approaches?

8. Can you think about a situation where you had to adapt your style or approach when engaging with people?

9. Is there anything else you would like to add regarding your involvement in the ClairCity project?

Thank you for your time.

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10.8. Interviews with ClairCity Project team - Round 2

University of the West of England
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Thank you very much for agreeing to participate in this interview. It won't take very long and I'd appreciate it if you could be as honest as possible regarding your views and thoughts about the ClairCity project. This is an opportunity to reflect on how the project is engaging and working with **the public.**

Thinking about your involvement:

10. Please describe your role in the project.

Thinking about working with the public:

11. In your opinion, what was the most successful way to engage the public with ClairCity?

12. And what was the least successful way to engage the public with ClairCity?

13. Please would you describe the biggest challenges that you have faced over the past four years when working with the public?

14. Reflecting on the past four years, Is there anything you would you have done differently to achieve your aims?

15. Have you learnt anything new from working with the public?

16. Did you use any new approaches compared to your ordinary work practices in order to involve people in ClairCity? Can you please give me some details about those approaches?

17. Can you think about a situation where you had to adapt your style or approach when engaging with people?

Thinking about your own behaviour:

18. Has working on ClairCity had any impact on your personal behaviour?
If yes, can you please explain how? What changes have you made? Are you doing anything differently?

19. Are you planning on doing anything/anything else differently?

20. Is there anything else you would like to add regarding your involvement in the ClairCity project?

Thank you for your time.

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10.9. British Science Association Activities

BRITISH SCIENCE WEEK

JOURNEYS THROUGH NATURE

Pollution solution

About this activity

When we look around, we do not usually see the 'air' so it is easy to assume that our air is clean. In reality, the air and the pollution in it are made up of mostly invisible gases. Many pollution particles are so small that we cannot see them. This means that it is hard to know if the air we breathe is clean or polluted. This experiment will help you discover how we can test for air pollution.

Time

1 hour

Kit list

- Bicarbonate of soda dissolved in water ("pollution")
- Red grape juice ("reagent")
- Droppers / spoons
- Beakers / cups (ideally white or clear)
- Sticky labels
- Paper
- Pen or pencil for recording ideas

Advance activity for teachers:

- Make 2 types of sample in large containers e.g. litre bottles: (A) neutral (just water) and (B) polluted (Add around 1-2 teaspoons of bicarbonate of soda per 500ml of water).
- Label the container of plain water (A) 'Park' and the water mixed with bicarbonate of soda (B) as 'Busy road'.

Instructions:

1. Your teacher should give you two containers of water. One labelled 'Busy road' and one labelled 'Park'.
2. Make a hypothesis about whether a busy road or a park would be likely to be more polluted.
3. Use a teaspoon or pipette to add ten drops of the 'reagent' to each container.
4. Watch for a reaction to see if the reagent changes colour when it is added to the sample.
5. Which container has the 'pollution' and which one does not? Is the more polluted container the busy road or the park? Why do you think this? Was your hypothesis correct?
6. What do you think are the biggest causes of pollution in the UK?
7. Can you think of any solutions to air pollution? Try designing a vehicle that creates no pollution.

Next steps:

- Why not write a letter to your local MP with your thoughts about air pollution?

  Use ClairCity's letter template: claircity.eu/2018/10/15/teachers-toolkit
- Make a poster about air pollution and what teachers and students can do to reduce it.
- Make a transport Top Trumps card game. You can make cards with existing transport options in your area and invent some futuristic ones too. Score each mode of transport on different attributes: Is it clean for the air? Is it fast? How expensive is it?
- This activity can be put towards a CREST Discovery Award and there are plenty more online activities you could try for free. For more information, follow this link: crestawards.org/crest-discovery

UWE Bristol

ClairCity

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BRITISH SCIENCE WEEK

Preserving natural diversity

Pollution solution

About this activity

One in eight deaths are due to air pollution – and yet human and planetary health are not at the heart of political decision-making. In this Top Trumps-style game, you will hold your own 'citizens assembly' to explore the trade-offs that we consider when making decisions about our health and that of the environment. You will learn the science of air pollution and carbon emissions, discover the solutions that exist and vote for what you want to prioritise and work on to improve air quality in our towns and cities.

Kit list

- Top Trumps cards (complete) - via link below
- Top Trumps template sheet (one for each pair) - accessible via link below
- Top Trumps template document (to be filled out during class) - accessible via link below
- Flipchart paper and pen
- Sticky dots

Time: 1 hour

Advance activity for teachers

- On a piece of flipchart, draw a table with symbols (or numbers) to represent each Top Trump in columns
- The full lesson plan is available here: www.activatelearning.com/resource/air-pollution-citizens-assembly
- Start the activity by brainstorming the causes/sources of air pollution and fill in one of the Top Trumps cards together, to make sure everyone understands the game
- Later on, hand out the complete packs of Top Trumps cards (see step 4).

Instructions

1. In pairs, discuss a few solutions to the air pollution problem.
   - What could we change?
   - What could we build?
   - What could we teach?
2. In pairs, fill in a Top Trumps card. Using an example of supermarkets delivering food by bike, you might ask:
   - How **difficult** is it for supermarkets to do this?
   - How **expensive** would it be to implement?
   - Would it affect delivery **speed**?
   - Would it cause **environmental** harm?
3. Follow step 2 for three more cards, based around the theme of transport.
4. Your teacher should then hand out the completed packs to you in your pairs. Add these complete packs to the four newly created cards.
5. Play the game. If you lose all your cards, and there is time, play again. Once you have played, think about what your favourite choice was.
6. Each pair should vote for their favourite, by sticking a dot on your preferred option.
7. You should then discuss trade-offs for the winning solution as a class:
   - What would you have to give up?
   - What would you gain?
   - Is there a perfect solution for everyone?

Next steps

Explore these ideas further by playing ClairCity Skylines (a sort of digital Top Trumps): claircity.eu/take-action/game

Develop an action plan for implementing the change. This could include:

- Get involved in Eco Schools and form an Eco Committee: eco-schools.org.uk
- Start a campaign at your school to address air pollution locally.
- Make a poster about air pollution and what teachers and students can do to reduce it.
- Host an event with invited speakers to inform teachers, parents and pupils.
- Write a persuasive letter to a polluting business to change their practices.
- Write a persuasive letter to your MP – use ClairCity's letter template here: claircity.eu/take-action/schools
- Check out the UK Student Climate Network ukscn.org

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