



## **CitiMeasure - Using citizen measurements to create smart, sustainable, and inclusive cities**

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## Acronyms

<b>BZK</b>	Ministry of the Interior and Kingdom Relations of Netherlands
<b>D</b>	Deliverable
<b>WG</b>	Working Group

# 1 Executive Summary

This report presents the material created to support the implementation of the three main outputs developed by CitiMeasure (2021-2023), a project to promote citizen science for smart, sustainable, and inclusive cities. These outputs result from the efforts of three working groups, each of which aimed to tackle the most pervasive challenges in mainstreaming citizen science: (a) changing behaviours and impacting policy; (b) addressing the digital divide; and (c) improving comparability and interoperability. The three CitiMeasure outputs, then, are (1) Guidelines on Behaviour & Policy Change; (2) Guidelines on Competencies for Digital Inclusion; and (3) CitiAIR, a comparability tool on citizen-based air quality monitoring initiatives. The purpose of the supporting material to these outputs has been to provide use instructions and training material on the one hand, and to disseminate the outputs for wider use on the other. Ideally, the supporting material presented in this report will thus contribute to the uptake of the guidelines and CitiAIR by cities, citizen scientists, researchers, practitioners, project initiators, and information professionals.

## 2 Introduction

### 2.1 ABOUT CITIMEASURE

Citizen measurement, or citizen science, initiatives contribute to a sustainable transition in European cities. By using an array of tools and instruments, citizens can play a role in the measurement and monitoring of indicators on air quality, temperature, soil moisture, biodiversity, or risk management, among many other environmental areas. Citizen measurement initiatives can also strengthen collaboration between different stakeholders and contribute to the democratisation of science and policy. The CitiMeasure project (2021-2023) aimed to bring together the experiences and expertise of European cities, organisations and networks in implementing citizen science initiatives (in the form of guidelines, toolboxes, online platforms, apps, etc.). The project built upon the lessons learnt from the Dutch City Deal WGs, a network of stakeholders working on the broader area of smart cities, including citizen measurement initiatives. The City Deals are an instrument of the Dutch Ministry of Interior Affairs and Kingdom Relations. CitiMeasure has used these experiences to inform the development of three outputs:

1. [Guidelines on Behaviour & Policy Change](#)
2. [Guidelines on Competencies for Digital Inclusion](#)
3. [CitiAIR](#), a comparability tool for participatory air quality monitoring initiatives in Europe

A fourth WG, Strategy and Oversight, focused on providing strategic direction and ensuring cohesion of activities across the three Instrument Sub-Groups and the project in general. CitiMeasure has also raised awareness of the importance of citizen science initiatives and capitalised on the results and tools of similar projects by creating an online European Knowledge Centre with a repository of good practices.

### 2.2 PURPOSE OF THIS REPORT

The primary purpose of this report is to present the training material supporting the implementation of the three CitiMeasure outputs outlined above.

## 2.3 STRUCTURE OF THIS REPORT

The following section introduces the training material for each output. The idea is to help citizen science initiative implementers, and anyone interested in promoting citizen science to make the best use of the CitiMeasure outputs. The report ends with a short conclusion. Annex 1 includes the training materials.

# 3 Supporting Tools and Guidance

## 3.1 GUIDELINES ON BEHAVIOUR & POLICY CHANGE

The Guidelines on Behaviour & Policy (D1.12 Final Instruments) aim to guide those interested in identifying, understanding, and enhancing policy and behavioural changes resulting from citizen science initiatives. They thus target those initiating citizen science projects or those who aim to study or improve current practices in existing citizen science initiatives. The guidelines include challenges and applications of citizen science and recommendations for cities and citizen science initiatives on how to foster policy and behaviour change using citizen science.

### 3.1.1 Training Material

The Guidelines on Behaviour & Policy Change come with instructions on how to use them. In this illustrative document, the vision of the guidelines, the content, colour coding, target groups, 65 specific recommendations, examples, case studies, and references are explained (see Figure 1).

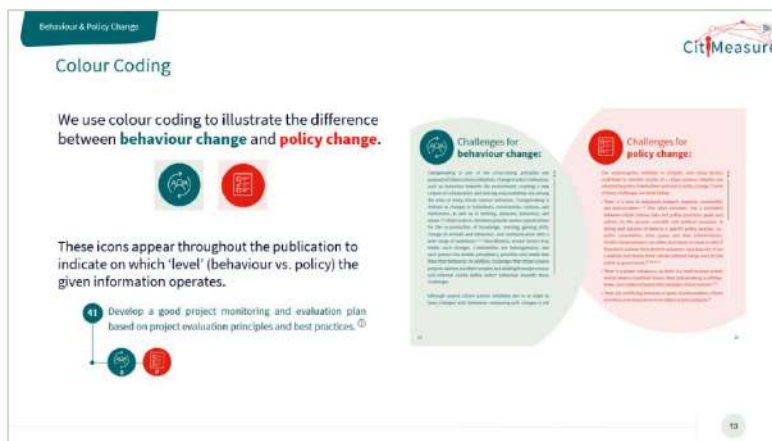


Figure 1: Use instructions for the Guidelines on Behaviour & Policy Change

Additional workshop material exists for use of the Guidelines on Behaviour & Policy Change (see Figure 2). This material aims to facilitate the use of the guidelines by cities and the citizen science community, so they identify what recommendations are more relevant to their specific contexts and inspire them with the examples and case studies. In the pilot in Barcelona (D1.10 Pilot Case Studies), different exercises were designed to help participants understand their needs and collectively reflect about potential solutions. Based on this experience, a step by a step approach is suggested in the training material. Five to 20 participants should be selected for a workshop during which a needs assessment is conducted. Here, participants are asked to use post-its to add the challenges they faced in their initiatives or projects in relation to behaviour and policy change. The exercise takes place [on Miro](#).

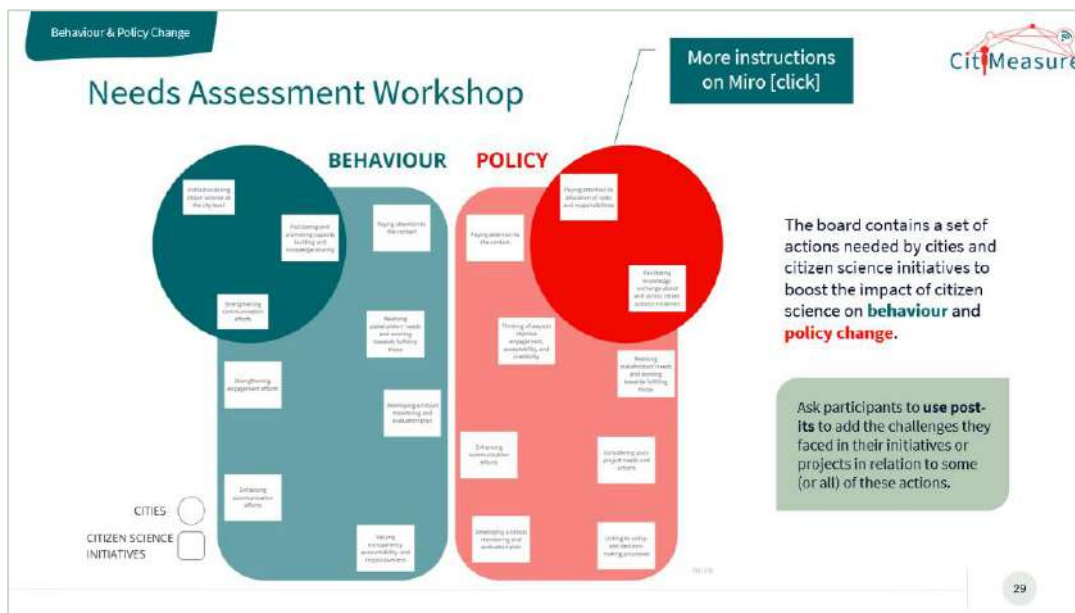


Figure 2: Needs assessment slide (Guidelines on Behaviour & Policy Change)

The needs assessment is followed by two interactive exercises. The first exercise is a role play in which different citizen science scenarios are presented (see Figure 3). Participants are then given guiding questions and instructions and encouraged to come up with implementation strategies (e.g., ‘How do you prevent dropouts?’). Roles range from ‘technical staff from the city council’ to ‘representative of research organisations.’



Behaviour & Policy Change

CitiMeasure

### Problem Statement 3

You are applying for a grant of EUR 50,000 to tackle bullying in schools following a citizen science approach.

The main objectives of this project are to understand the drivers of these bad practices and help young people improve their mental health.

**Guiding questions:**

- What type of project would you design?
  - Which specific behaviours would you like to encourage and which ones would you like to discourage? How?
- What stakeholders would you like to involve in your project application to increase your chances of getting this funding?
- How do you ensure learning among the students and teachers participating?




Figure 3: Example of a scenario in Exercise 1 (Guidelines on Behaviour & Policy Change)

The second exercise is a reflection on the policy aspects of citizen science. Numerous thematic areas are covered, ranging from legislation to funding (see Figure 4).

Behaviour & Policy Change

CitiMeasure

### Exercise 2: Policy aspects

- What are typical **conflicts of interest** between citizen science projects and policy/decision makers?
- How could you better align citizen science **data** and policy questions, objectives, and actions?
- How could you better align citizen science **outputs** with current political structures and processes?
- How can you facilitate **knowledge exchange** among different actors to face the challenge at hand?
- Do you need to change any **legislation** to facilitate the policy uptake of this project?
- How could you increase **trust** between citizen science initiators and policy-makers?
- Are there **constraints in time, resources, and expertise** that could prevent policy uptake? How can you best address these constraints?
- How would you **communicate** the project results to the authorities?
- How would you measure the **impact** of the project?
- Are there any **funding**-related considerations that could facilitate policy uptake?



Figure 4: Exercise 2 (Guidelines on Behaviour & Policy Change)

The idea of the exercises is to help project implementers and participants make the best use of the guidelines and to adjust them to their specific experiences and needs. The group should be able to select from all 65 recommendations the ones most relevant to them.

Annex 1 includes the PDF with the training material.

## 3.2 GUIDELINES ON COMPETENCIES FOR DIGITAL INCLUSION

The Guidelines on Competencies for Digital Inclusion unpack the issue of competencies by identifying skills, knowledge, and attitudes that may be required for the participation of citizens in citizen science



initiatives and those needed by project initiators to establish and run such initiatives. The guidelines also provide recommendations on how to systematically think about and enhance these actors' competencies. They are primarily developed to guide those who are interested in identifying, understanding, and enhancing capacities and competencies required for digital inclusion of different actors in citizen science projects.

### 3.2.1 Training Material

The Guidelines on Competencies for Digital Inclusion too come with use instructions. The vision of the guidelines, content, 27 clusters, colour coding, target groups, 32 specific recommendations, examples, case studies, and references are explained in the same way as the use instructions for the Guidelines on Behaviour & Policy Change (see Figure 5).

**Guidelines on Competencies for Digital Inclusion**

**What exactly do they contain?**

- 27 clusters of competencies** (skills, knowledge, and attitudes) for digital inclusion of different actors in citizen science projects
- 32 specific recommendations** on how to enhance those competencies
- Based on **39 resources** (peer-reviewed and grey publications)

**Who was involved in developing the guidelines?**

Co-created in a collaboration among **24 individuals**:

- representing 7 cities
- representing 9 different organisations

**7 clusters of skills**

- Scientific research skills
- Data management skills
- IT & internet skills
- Digital software skills
- Technical (hardware) skills
- IT support skills
- Translation skills

**9 clusters of knowledge**

- General knowledge
- Local knowledge
- Knowledge of the project
- Knowledge of the project's goals
- Knowledge of the project's methods
- Knowledge of the project's results
- Knowledge of the project's impact
- Knowledge of the project's funding
- Knowledge of the project's partners

**11 clusters of attitudes**

- Openness
- Curiosity
- Interest
- Engagement
- Collaboration
- Teamwork
- Communication
- Leadership
- Resilience
- Flexibility
- Adaptability

**Colour Coding / Clustering**

**Skills**

- One of three **Competencies** (Skills, Knowledge, Attitudes).
- One of 27 **Clusters**.
- These **icons** indicate who the Cluster is relevant for (citizen scientists, project initiators, information professionals).
- One of many **Subclusters**.
- Examples** under Subclusters.
- Citizen science **Project Examples**.

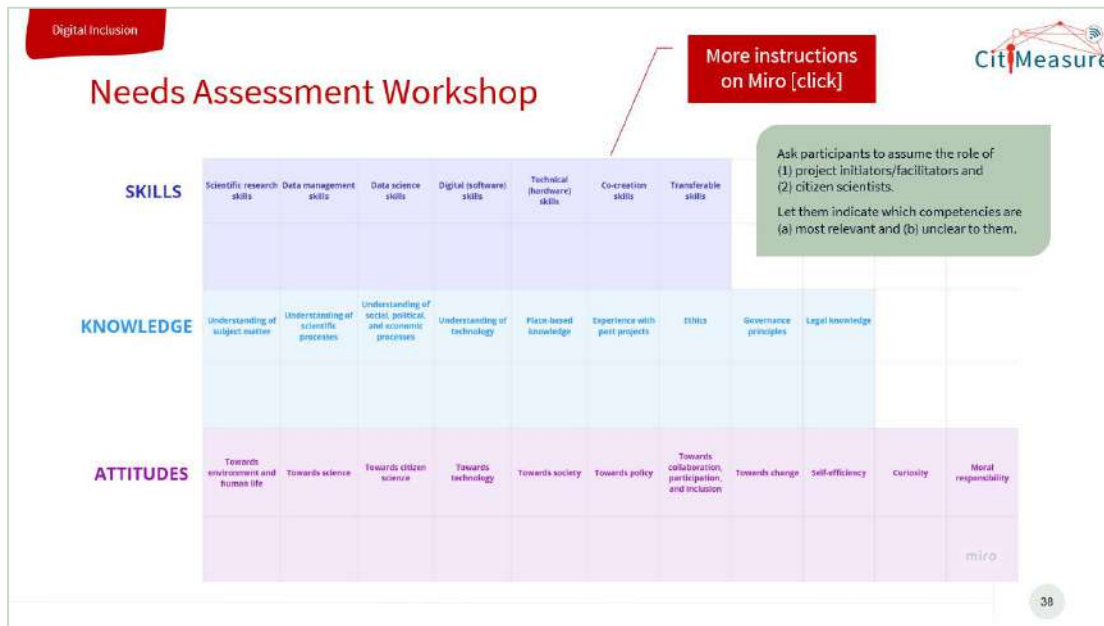
**Scientific research skills**

- Research design and execution**
  - Formulating and methodological skills for planning or carrying out scientific research
  - Ability to experiment design in the collection and analysis of research data
  - Writing research proposals
  - Managing research operations
  - Scientific mentoring and organisational skills
- Data collection**
  - Planning and recording
  - Clearing and collecting data about biodiversity
  - Collecting data in a coordinated manner
  - Data collection in field research
  - Integrating observations in the project's database

Figure 5: Use instructions for the Guidelines on Competencies for Digital Inclusion

In addition to the use instructions, CitiMeasure provides workshop material for citizen scientists, project initiators, and information professionals interested in implementing the Guidelines on Competencies for Digital Inclusion in citizen science projects. This material aims to help the implementers and project participants understand the guidelines in the context of a workshop. The

number of participants can range between five and 20. The workshop includes a needs assessment (see Figure 6) and self-assessment exercise (see Figure 7).



**Needs Assessment Workshop**

More instructions on Miro [click]

Ask participants to assume the role of (1) project initiators/facilitators and (2) citizen scientists. Let them indicate which competencies are (a) most relevant and (b) unclear to them.

SKILLS	Scientific research skills	Data management skills	Data science skills	Digital (software) skills	Technical (hardware) skills	Co-creation skills	Transferable skills				
KNOWLEDGE	Understanding of subject matter	Understanding of scientific processes	Understanding of social, political, and economic processes	Understanding of technology	Place-based knowledge	Experience with past projects	Ethics	Governance principles	Legal knowledge		
ATTITUDES	Towards environment and human life	Towards science	Towards citizen science	Towards technology	Towards society	Towards policy	Towards collaboration, participation, and inclusion	Towards change	Self-efficacy	Curiosity	Moral responsibility

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Figure 6: Needs assessment slide (Guidelines on Competencies for Digital Inclusion)

In the needs assessment, participants are asked, [on Miro](#), to assume the roles of project initiators and citizen scientists to find out which competencies are most relevant and unclear to them. In this way, participants identify which competencies are important for different actors and can refer to the guidelines to better understand what the different clusters mean.



**Self-Assessment**

The following self-assessment for participants shall serve as a mere guidance; it is by no means an 'exam.' Nor does it aim to make definitive statements about people's digital competencies.

Please note that the results are no reason for exclusion. By contrast, they shall help project initiators better understand how **strategies for inclusion** can be developed.

For instance, if project initiators find that many participants score low on digital software skills, they might want to think about ways in which these skills can be improved. Or, if few participants have an understanding of 'social justice,' project leaders can work on including principles of transformative action.

All questions are loosely based on the 27 clusters (see previous slide). We are aware that some of the questions may lead to biased answers.

We do not provide a fixed evaluation form to avoid conveying the message that some participants do not 'qualify' for citizen science projects.

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Figure 7: Self-assessment slide (Guidelines on Competencies for Digital Inclusion)

The self-assessment helps project implementers get an overview of the competencies of the participants to be able to maximise digital inclusion.

Again, the idea of both assessments is to help project implementers and participants adjust the guidelines to their specific experiences and needs. Ideally, at the end of the training, the group will be able to select from all 32 recommendations the ones most relevant to them. Annex 1 includes the full presentation of the training materials.

### 3.3 COMPARABILITY TOOL: CITIAIR

CitiAIR is the first online inventory of participatory air quality initiatives in Europe. An interactive map invites users to compare different initiatives. To date, more than 46 initiatives have been added to the inventory. Contact details are provided so that organisations can get in touch with one another and share lessons learnt. Users for their part can check whether projects are available in their neighbourhood. The idea is not only to make citizen science initiatives on air quality more comparable, but also to raise awareness of the issue of air pollution.

#### 3.3.1 Training Material

The CitiMeasure team developed use instructions for CitiAIR, explaining (a) how to use the tool (see Figures 8 and 9) and (b) how to add new initiatives (see Figures 8, 9 and 10).

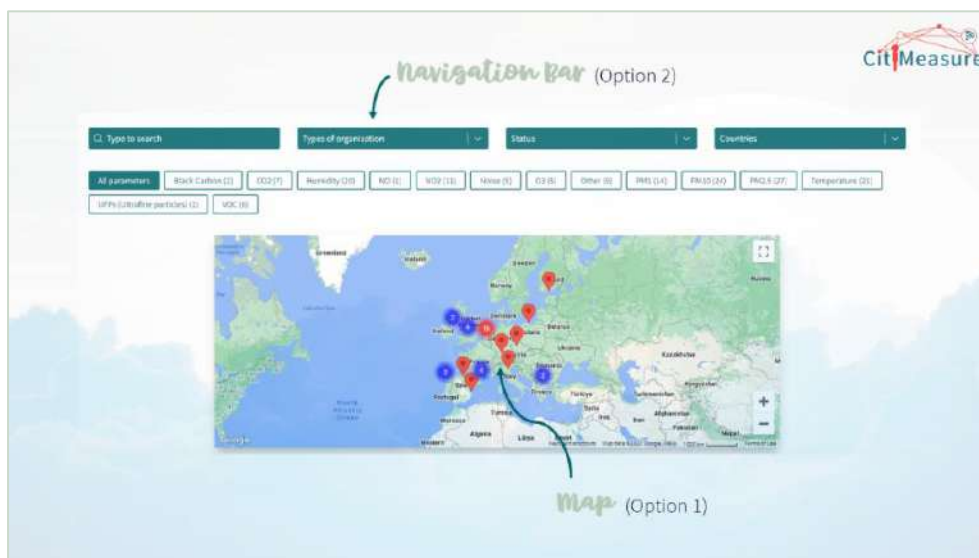


Figure 8: CitiAIR – How to use the tool (Example 1)

## Option 1: Use the Map

Users can directly access the map and explore different initiatives. These are represented using a **location identifier**.

If numerous initiatives exist in a region, they are clustered. This way, users can identify particularly active regions right away.

Once they click on the blue circle, the map zooms in on the respective initiatives. Users can then select the initiative they are interested in.




Figure 9: CitiAIR – How to use the tool (Example 2)

## CitiAIR

Share your citizen science air quality story



- 1 Fill in information about your organisation.** Please include a real address so the map can find you!
- 2 Add information about your citizen science initiative on air quality.** Please share your best estimates with the community!
- 3 Add technical details about the equipment used in your initiative.** If there are multiple devices, please repeat this step as often as necessary.
- 4 Fill in information about your data platform and lessons learnt.** Think about what you want to share.

Fill-in time: 30 minutes

Figure 10: CitiAIR – How to add new initiatives

If needed, the CitiMeasure team can provide a PDF version of the questionnaire – containing every question on technical details, data use, or contact information – to organisations interested in submitting their initiative. The PDF is particularly useful to organisations which would like to get an overview of all questions before submitting the online form via the CitiAIR website (see Figure 11).

STEP 1: YOUR ORGANISATION/DEPARTMENT	
First Name:	Last Name:
Email:	Phone:
What is the name of your organisation?*	Website/URL:
What best describes the type of organisation that you are representing? <ul style="list-style-type: none"> <li>• City administration</li> <li>• Government administration</li> <li>• National or International NGO</li> <li>• Community-based / Civil Society Organisation</li> <li>• Private company</li> <li>• Academia</li> <li>• Schools</li> <li>• Other</li> </ul>	
Where are you based? (location)	
City	State/Province/Region
ZIP/Postalcode	Country
STEP 2: YOUR INITIATIVE	
<i>The initiative should have involved citizens (directly or indirectly).</i>	
What is the name of your initiative?*	
How would you describe your initiative's mission? <ul style="list-style-type: none"> <li>• Measure/monitor air quality</li> <li>• Raise awareness/education</li> <li>• Commercialize air quality sensors</li> <li>• Measure personal exposure</li> <li>• Advocate for air quality policies</li> <li>• Air quality modelling</li> <li>• Smart/sustainable mobility</li> <li>• Environmental justice</li> <li>• Other</li> </ul>	
Please provide a short description of your initiative? Who is participating, who is your target audience...? [max 80 words]	
Who is your main audience?	
<ul style="list-style-type: none"> <li>• Citizen</li> </ul>	

Figure 11: The CitiAIR submission questionnaire

Internal use instructions for the backend of the CitiAIR website, outlining the necessary steps to add an initiative, have also been included in D2.4 Training Programme. These instructions give a short introduction and are aimed at (administrative) staff new to the project.

### 3.3.2 Dissemination

Two infographics and a promotional video built the foundation for the dissemination of CitiAIR. The communications infographics included: (1) an infographic showcasing the benefits of adding initiatives (aimed at organisations; see Figure 12); (2) an infographic showcasing the benefits of using the tool (aimed at individual users; see Figure 13). The promotional video displayed the CitiAIR inventory in numbers, including CitiAIR “members,” participants reached, and project cities.





Figure 12: CitiAIR – Benefits of adding an initiative



Figure 13: CitiAIR – Benefits of using the tool

The promotional video has been [distributed on LinkedIn](#).

## 4 Conclusion

The material presented here was developed to support the implementation of the three CitiMeasure outputs: (1) Guidelines on Behaviour & Policy Change; (2) Guidelines on Competencies for Digital Inclusion; and (3) CitiAIR, a comparability tool. We hope that the training material will encourage decision-makers to include citizen science in their programming. We also hope that, through the dissemination of the outputs in our network, we will reach groups that traditionally have less contact with citizen science.

## Annex 1 – Training Material

This annex includes two presentations including the Training Material Programme and the CitiAIR Use Instructions for External Users. It also includes a PDF with the full questionnaire of CitiAIR.



# CitiMeasure

Using citizen measurements to create  
smart, sustainable and inclusive cities

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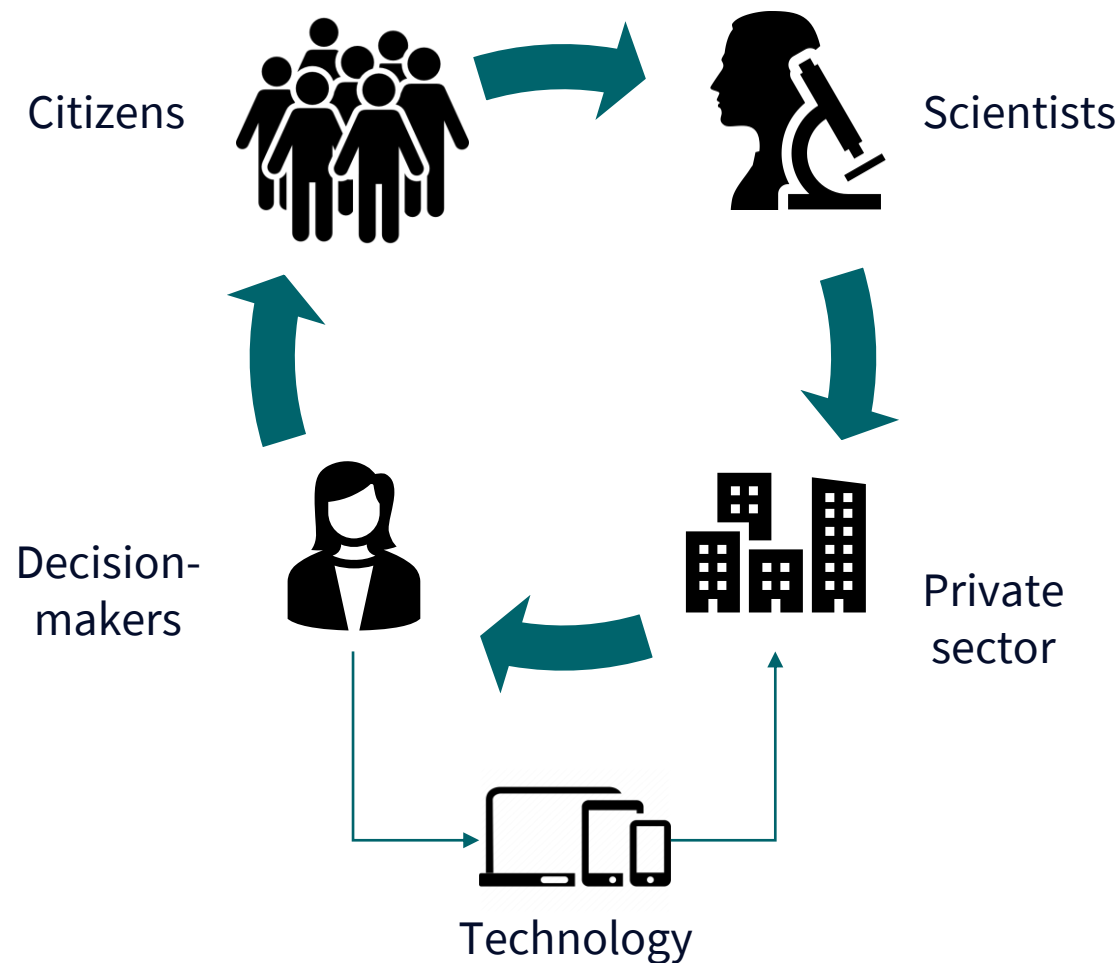
TRAINING PROGRAMME  
MATERIAL

# 1

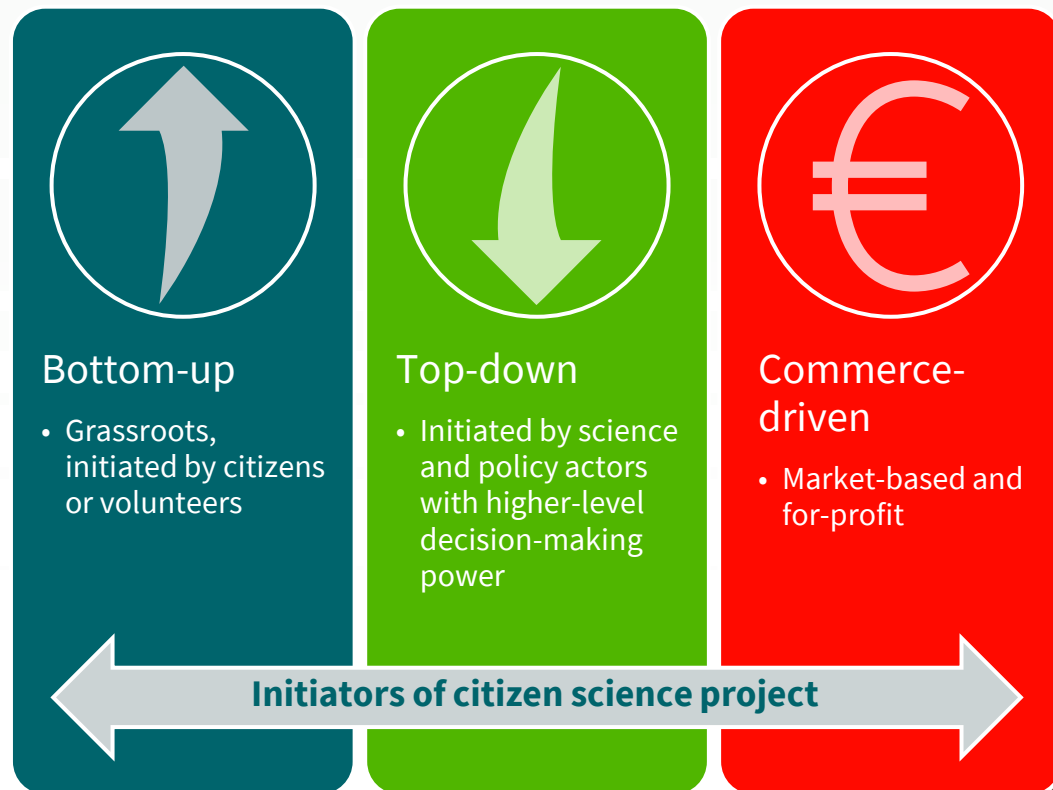
## Citizen Science and CitiMeasure

# What is Citizen Science?

**Citizen Science** entails a spectrum of **participatory processes** with the aim of studying an issue (often a natural phenomena) using scientific methods and often involves **collaboration** between **citizens**, **scientists**, **private sector** and (increasingly) **decision-makers**.



# Typologies of Citizen Science Projects



(Ciravegna et al., 2013, Gharesifard et al., 2017)



## Benefits of Citizen Science Projects

- ✓ They increase **efficiency**
  - ✓ More comprehensive information
  - ✓ Better decision-making
- ✓ They foster **empowerment, equity, transparency and accountability**
  - ✓ Democratising science/policy
- ✓ They strengthen **social cohesion**
  - ✓ Reducing conflicts
  - ✓ Environmental justice/mediation







## Challenges of Citizen Science Projects

- ✧ Trust in the process and **quality** of results
  - Ability of citizens to conduct scientific research
  - Quality of citizen-generated data
- ✧ **Comparability** and interoperability
  - Difficulty to connect to established processes
- ✧ Long-term **sustainability** of initiatives
  - Sustained engagement of citizens/stakeholders
  - Financial sustainability and business models
- ✧ Measuring and **communicating** outcomes
  - Impacts materialising after lifetime of project





Promoting citizen science to create smart, sustainable, and inclusive cities



June 2021 to May 2023



Funded by Directorate-General Structural Reform Support (DG REFORM)



3+1 working groups, 40+ cities and organisations, +70 individual members



1. CitiAIR: Comparability Tool on Participatory Air Quality Initiatives
2. **Guidelines on Behaviour & Policy Change**
3. **Guidelines on Competencies for Digital Inclusion**

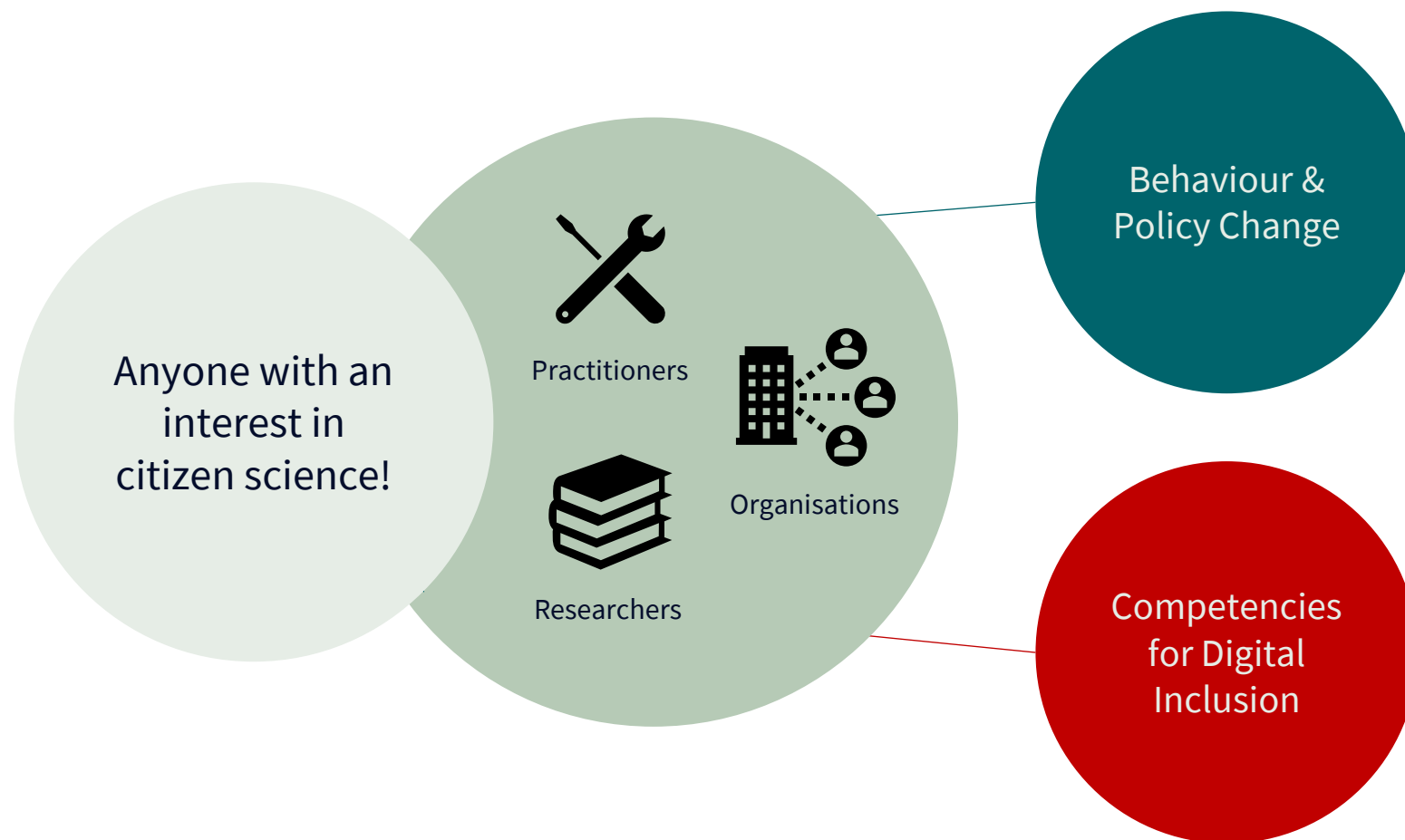




# 2

# Guidelines

# Who are these guidelines for?



*Particularly relevant for*



Cities



Citizen Science Initiatives

*Particularly relevant for*



Citizen Scientists



Project Initiators

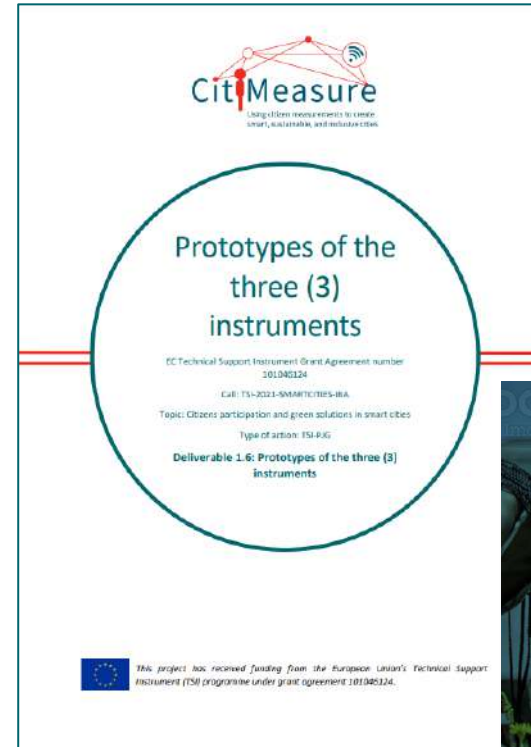


Information Professionals

# Behaviour & Policy Change

## VISION

- Facilitate **changes in behaviour** of different stakeholders
- Advancing the understanding of trust, participation behaviour, collaboration, sharing responsibilities, and decision- and policy-making processes



PDF document



Animated visualisation

# Guidelines on Behaviour & Policy Change

## What exactly do they contain?



**65 specific recommendations** to identify, understand, and enhance policy and behavioural changes resulting from citizen science initiatives.

Based on **59 resources** (peer-reviewed and grey publications)

## Who was involved in developing the guidelines?

Co-created in a collaboration among **35 individuals**:

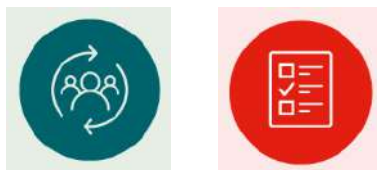
- representing 19 cities
- representing 7 different organisations





## Colour Coding

We use colour coding to illustrate the difference between **behaviour change** and **policy change**.



These icons appear throughout the publication to indicate on which 'level' (behaviour vs. policy) the given information operates.



### Challenges for behaviour change:

Changemaking is one of the cross-cutting principles and purposes of citizen science initiatives. Change in actors' behaviour, such as behaviour towards the environment, creating a new culture of collaboration and sharing responsibilities are among the aims of many citizen science initiatives. Changemaking is defined as changes in individuals, communities, cultures, and institutions, as well as in thinking, attitudes, behaviour, and values.<sup>27</sup> Citizen science initiatives provide various opportunities for the co-production of knowledge, learning, gaining skills, change of attitude and behaviour, and communication with a wide range of audiences.<sup>2, 4, 9</sup> Nevertheless, several factors may hinder such changes. Communities are heterogeneous, and each person has certain perceptions, priorities and needs that drive their behaviour. In addition, challenges that citizen science projects address are often complex and existing formal processes and informal norms define actors' behaviour towards those challenges.

Although several citizen science initiatives aim to or claim to have, changed actor behaviour, measuring such changes is not

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### Challenges for policy change:

The science-policy interface is complex, and many factors contribute to whether results of a citizen science initiative are adopted by policy stakeholders and lead to policy change.<sup>7</sup> Some of these challenges are listed below:

- There is a lack of alignment between research, community, and policymakers.<sup>2, 20</sup> This often translates into a mismatch between citizen science data and policy questions, goals and actions on the ground, scientific and political processes in timing and aptness of data to a specific policy process, i.e., public consultation, time cycles, and data infrastructures. Citizen science projects are often short-lived or cease to exist if they don't achieve their desired outcomes, and data can sit on a website and reside there silently without being used by the public or government.<sup>23, 30, 32, 35</sup>
- There is a power imbalance, so there is a need to share power and be aware of political biases. Most policymaking is still top-down, and evidence-based often excludes citizen science.<sup>2, 22</sup>
- There are conflicting interests or goals of policymakers, citizen scientists and researchers from citizen science projects.<sup>30</sup>

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## Target Groups



### **Cities**

This refers to the governance level and includes (among others) everyone working in policy, planning, finance and administration, architecture, operations, community development, and environment and climate change.



### **Citizen Science Initiatives**

Any initiative promoting the involvement of members of the public in some aspect of scientific research, including but not limited to data collection, interpretation, analysis, and communication.

## Recommendations

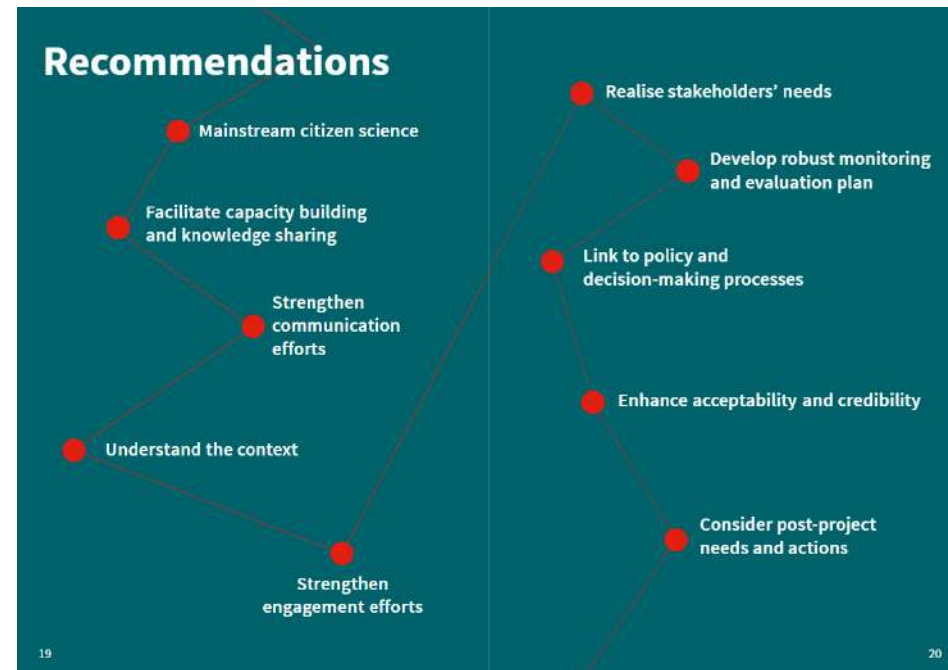
The CitiMeasure working group members developed **10 categories** of recommendations with **65 specific recommendations** for **cities** and **citizen science** projects that aim to influence behaviour and/or policies.

Every recommendation comes with small icons indicating the **behaviour/policy** dimension **and** whether the recommendation is particularly relevant for **cities** or **citizen science** initiatives.

- 47 Constantly identify evolving policy linkages of the citizen initiative, e.g., with bulletins directed to competent authorities and adapting to changing contexts (and scales). ⓘ



*This recommendation is relevant for cities and citizen science initiatives.*





## Examples

We included **11 examples** of how different organisations and citizen science projects promote behaviour and policy change.

All examples are referenced in the Recommendations section. They help illustrate our suggestions.

19 Use traditional advertising techniques to reach out to less tech-savvy parts of the population or those with limited access to technology. <sup>1</sup>

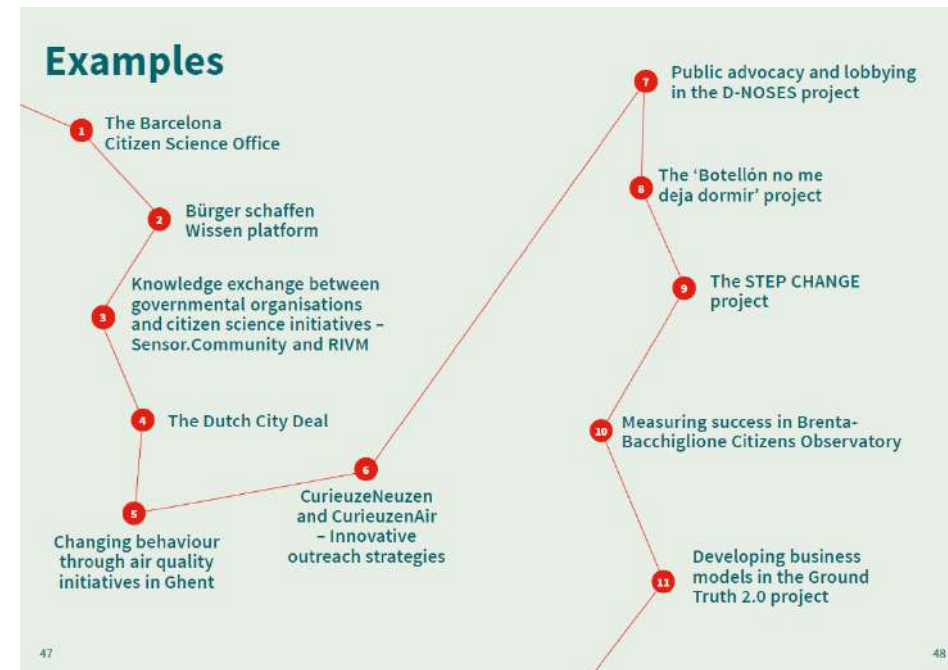
CurieuzeNeuzen and CurieuzenAir - Innovative outreach strategies



19 Example 6:  
**CurieuzeNeuzen and CurieuzenAir - Innovative outreach strategies**

20 The CurieuzeNeuzen project used in its recruitment process both traditional media, including TV, radio, printed media, billboards, as well as online media such as websites and social media. In addition, citizens were involved in innovative ways, including colourful V-boards as points of recognition of participants; postcards; ads at the Ringland Rock Festival (June 2016); a booth at a science innovation festival (September 2018); video clips with well-known artists as ambassadors; and a large knowledge event with 900 citizen researchers in Antwerp in 2016. <sup>1</sup>

21 + See the full project



## Case Studies

Our case studies are different from examples. They describe how the Guidelines on Behaviour & Policy have been applied in **Roeselare** and **Barcelona**.

We also refer to them as **pilot projects**.

They illustrate how the guidelines have been implemented in practice – and, ideally, should serve as an **inspiration** for other cities interested in promoting citizen science!

**Boosting the potential of a citizen science project in Roeselare**

The city of Roeselare is a municipality in West Flanders (Belgium). Residents have been experiencing abnormal droughts and intense rainfall in recent years, leading to catastrophic floods. The Flemish government awarded 'The Smart in the City' prize to the citizen science project Smartwaterland, which involved school students in building pluviometers to collect precipitation data to manage rainwater in a potentially smarter way. By involving students in measuring rainfall, families and other stakeholders could become more aware of the effects of climate change, and authorities could use the data for better planning.

Smartwaterland was the first citizen science project coordinated by the city council in collaboration with other partners. Through the CitMeasure pilot, the city aimed to boost the project's potential in two key areas: communication and impact evaluation. The city aimed to strengthen the project's communication efforts to raise awareness of data, targeting young and old people, agriculture and other businesses, and internal employees. In addition, there was a need for a tailor-made impact assessment matching the specific aims and ambitions of citizen science projects.

The CitMeasure Guidelines on Behaviour & Policy Change raised awareness in the city of the importance of a communication strategy and a robust evaluation plan. By selecting and applying a set of recommendations, the pilot team helped the city design these products considering the needs and challenges at the local level. With the support of additional resources, different indicators and impact domains were identified for the future evaluation of the project.

Based on the experience of the city of Roeselare, the guidelines include good practices and examples for inspiration, but they are not a 'one-size fits all' document. These guidelines should be a basis to trigger thinking about different aspects of citizen science projects and decide with the project team which ones are relevant in each case. Furthermore, a certain level of experience and knowledge is needed to operationalise the application of the guidelines.




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## References

We provide references all throughout the guidelines.

The Dutch National Institute for Public Health and the Environment (RIVM) aims to increase data comparability across Europe and further integrate citizen science data into its databases. In collaboration with other initiatives such as Sensor.Community, the RIVM has developed a data infrastructure that has informed other projects like Snuffelfiets (“Sniffer Bike”) or Hollandse Luchten (“Dutch Skies”).<sup>①</sup>

A click on the ‘info’ icon  will open a pop-up window with the specific reference. We hope these references encourage you to **dig deeper** into citizen science.

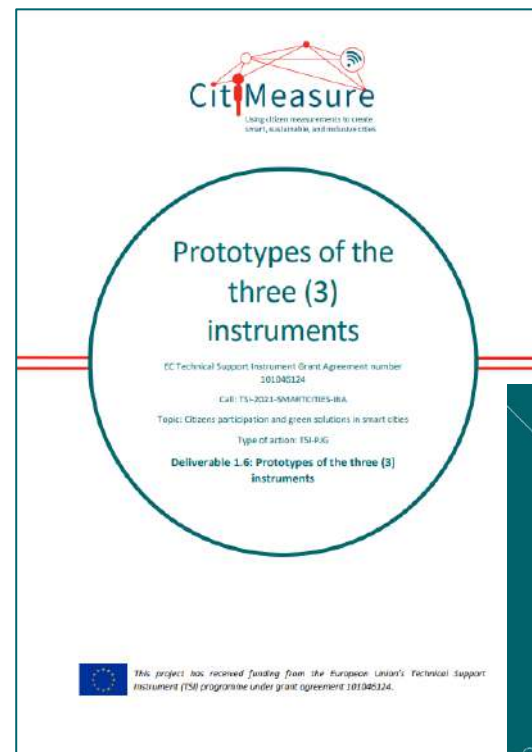


- <sup>22</sup> Phillips, T, et al. 2018. A Framework for Articulating and Measuring Individual Learning Outcomes from Participation in Citizen Science. *Citizen Science: Theory and Practice*, 3(2): 3, pp. 1–19, DOI: <https://doi.org/10.5334/cstp.126>
- <sup>23</sup> Misonne, Delphine. (2020). The emergence of a right to clean air: Transforming European Union law through litigation and citizen science. *Review of European, Comparative & International Environmental Law*. 10.1111/reel.12336. <https://doi.org/10.1111/reel.12336>
- <sup>24</sup> Mollie Latham, & Luigi Ceccaroni. (2020). Deliverable 4.1: Guidelines and Recommendations Based on a Range of Best Practices for Achieving Societal and Policy-maker Engagement. Zenodo. <https://doi.org/10.5281/zenodo.3690772>
- <sup>25</sup> Ghahesifard, M. (2020). Community-based monitoring initiatives of water and environment Evaluation of establishment dynamics and results. <https://doi.org/10.1201/9781003131243>
- <sup>26</sup> Ajzen, I. (2005). *Attitudes, personality, and behavior*: McGraw-Hill International.
- <sup>27</sup> Berti Suman, A., Schade, S., & Abe, Y. (2020). Exploring legitimisation strategies for contested uses of citizen-generated data for policy. In B. J. Richardson (Ed.), *From student strikes to the extinction rebellion: New protest movements shaping our future* (Special issue ed., Vol. 11, pp. 74–102). Edward Elgar Publishing Ltd. <https://doi.org/10.4337/9781800881099.00008>
- <sup>28</sup> Cologna, V., & Siegrist, M. (2020). The role of trust for climate change mitigation and adaptation behaviour: A meta-analysis. *Journal of Environmental Psychology*, 69, 101428. <https://doi.org/https://doi.org/10.1016/j.jenvp.2020.101428>
- <sup>29</sup> Kieslinger, B., Schaefer, T., Heigl, F., Dörler, D., Richter, A., & Bonn, A. (2017). The Challenge of Evaluation: An Open Framework for Evaluating Citizen Science Activities. <https://doi.org/10.17605/OSF.IO/ENZC9>
- <sup>40</sup> Weyhenmeyer, G. A., Mackay, M., Stockwell, J. D., Thiery, W., Grossart, H. P., Augusto-Silva, P. B., Baulch, H. M., de Eyto, E., Hejzlar, J., Kangur, K., Kirillin, G., Pierson, D. C., Rusak, J. A., Sadro, S., & Woolway, R. I. (2017). Citizen science shows systematic changes in the temperature difference between air and inland waters with global warming. *Scientific reports*, 7, 43890. <https://doi.org/10.1038/srep43890>

# Digital Inclusion

## VISION

- Advancing the understanding of **'competencies'** for digital inclusion
- Helping citizens participate in citizen science initiatives
- Helping policy-makers, decision-makers and municipal employees engage citizens



PDF document



Animated visualisation



# Guidelines on Competencies for Digital Inclusion

## What exactly do they contain?



**27 clusters of competencies** (skills, knowledge, and attitudes) for digital inclusion of different actors in citizen science projects

**32 specific recommendations** on how to enhance those competencies

Based on **39 resources** (peer-reviewed and grey publications)

## Who was involved in developing the guidelines?

Co-created in a collaboration among **24 individuals**:

- representing 7 cities
- representing 9 different organisations

### 7 clusters of skills



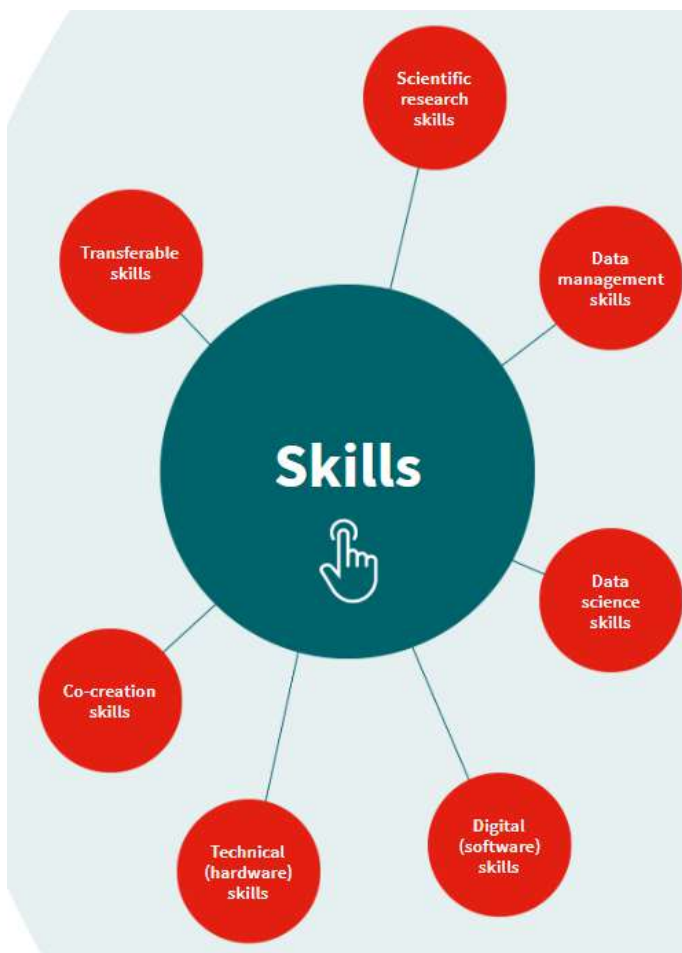
### 9 clusters of knowledge



### 11 clusters of attitudes



# Colour Coding / Clustering



**Skills**

**Scientific research skills** <sup>①</sup>

CS PI IP

- Research design and execution** <sup>①</sup>
  - Practical and methodological skills for planning and carrying out scientific research <sup>①</sup>
  - Capacity to involve citizens in the collection and analysis of research data <sup>①</sup>
  - Asking research questions <sup>①</sup>
  - Answering research questions <sup>①</sup>
  - Scientific reasoning and argumentation skills <sup>①</sup>
- Data collection** <sup>①</sup>
  - Observing and recording <sup>①</sup>
    - Observing and collecting data about biodiversity
    - Collecting data in a standardised manner
    - Data collection in CitieS-Health
  - Submitting observations to the project database

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One of three **Competencies** (Skills, Knowledge, Attitudes).

One of 27 **Clusters**.

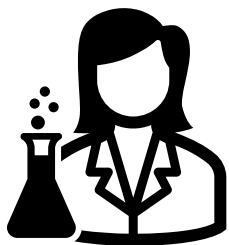
These **icons** indicate who the Cluster is relevant for (citizen scientists, project initiators, information professionals).

One of many **Subclusters**.

**Examples** under Subclusters.

Citizen science **Project Examples**.

## Target Groups



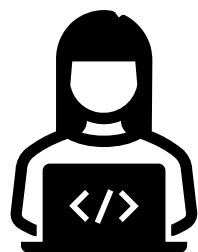
### **Citizen Scientists**

Members of the general public participating in one or more steps of scientific research, typically as part of a collaborative project with professional scientists and other relevant actors.



### **Project Initiators**

Those involved in setting up and/or running the citizen science initiative (including scientists, municipal employees, decision-makers, policy-makers, and citizens in case they assume that role).



### **Information Professionals**

Those involved with management of data, including librarians and professional data management staff.



## Recommendations

The CitiMeasure working group members developed **7 categories** of recommendations with **32 specific recommendations** that are relevant to all actors involved in citizen science projects.

Some recommendations provide **project examples** of particularly successful applications of digital inclusion.

29 Think of possibilities for providing feedback and interactive communication among actors involved. ⓘ

 The ClairCity project

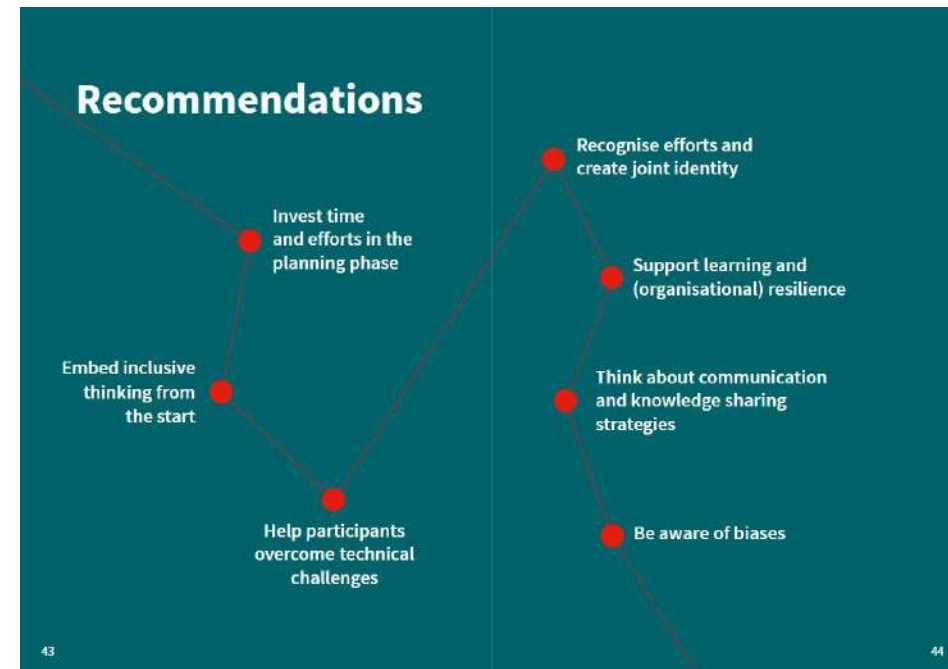


Example 11: **The ClairCity project**

The ClairCity project sought to incorporate social psychological theories in air quality and carbon management and involved over 818,000 citizens across Europe in six case studies. The project identified demographic groups and social groups in their visuals and communications. It considers science communication as an essential element for the success of these types of projects. Tailored communications are particularly powerful, as they enhance credibility and emotional engagement to ensure the findings and insights reach the desired audience. The following graph showcases a social card distributed in Bristol, one of the case studies.

[+ See the full project](#)

Users will be redirected to the Examples section.



## Examples

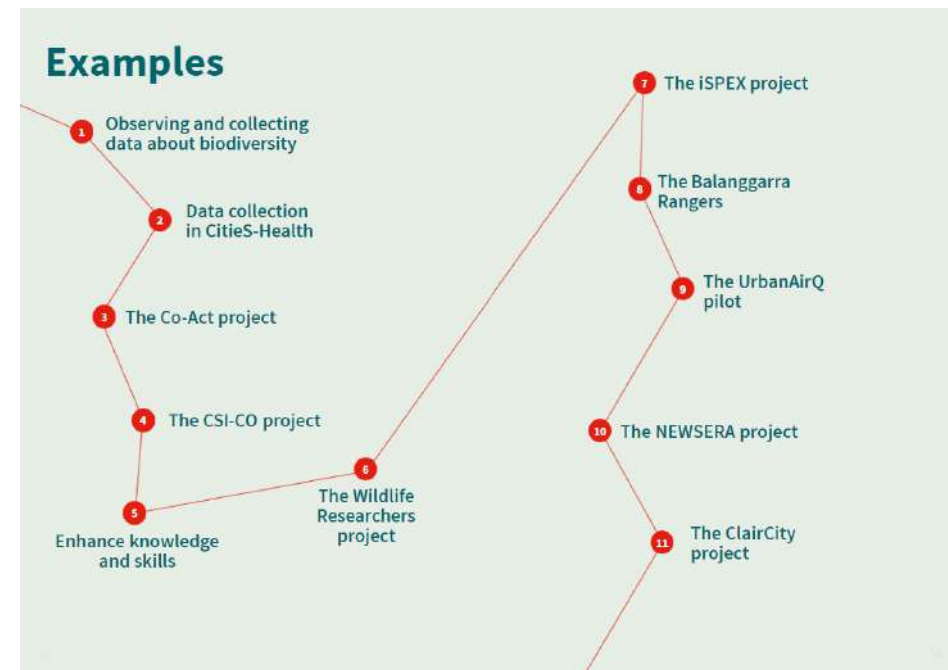
We included **11 examples** of how different organisations and citizen science projects promote competencies for (digital) inclusion.

All examples are referenced in the Competencies Framework and Recommendations sections.

**Think about communication and knowledge sharing strategies**

27 The format of communication needs to match the target audience. For example, visualisations can ensure scientific content is comprehensible for a large target audience and potentially incentivise further engagement.<sup>①</sup>

 The NEWSERA project



## Case Studies

Our case studies are different from examples. They describe how the Guidelines on Competencies for Digital Inclusion have been applied in **Barcelona** and **Prague**.

We also refer to them as **pilot projects**.

They illustrate how the guidelines have been implemented in practice – and, ideally, should serve as an **inspiration** for other cities interested in promoting citizen science!

**Understanding the competencies of students measuring air quality in Prague**

Like many other European cities, Prague, the capital of Czechia, is facing air quality problems. Senzorvzduchu, z.s. ("Air Sensor") is an NGO which promotes community building through air quality measurements using the Sensor.Community DIY sensor kit solution. The CitiMeasure pilot focused on a project called Sensor2School, the aim of which was to build 50 sensors in schools together with students, discussing the possibility of citizen measurements and the importance of air quality. Students develop their sensors, start measuring in their schools, and use an information board with a QR code to see the results shared via a web platform.

This pilot aimed to test the application of the CitiMeasure Guidelines on Competencies for Digital Inclusion to assess the competencies required for, and acquired by, participation in the Sensor2School initiative. To do so, pre- and post-project surveys were designed that helped the project team understand the competencies needed for participation. It also revealed acquired knowledge and changes in students' perception of air quality.

The CitiMeasure guidelines provided a much-needed framework for these assessments. The pilot resulted in a better understanding of the scope and focus of the tools, skills and knowledge needed to start and run sensor-building workshops and measurements in schools. These insights can help with the future design of Sensor2School activities, or similar projects.

The Sensor2School participants found the collaboration on the design of both surveys particularly beneficial and necessary. At a higher level, the pilot helped the Sensor2School project define priorities and think about citizen science differently. The interactions with CitiMeasure provided new perspectives as citizen science initiatives are still relatively recent in the local context. For example, after the discussions with the working group members, the Sensor2School project is planning to increasingly focus on inequalities by comparing data and school surveys in structurally disadvantaged cities and regions such as Osti and Labem, Karlovy Vary, and the Moravian-Silesian region.



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## References

We provide references all throughout the guidelines.

Other important elements were the information they received from the project, the interaction they had with other participants, project staff, and scientists, and the feedback and recognition they received from the project. The eu-citizen.science Training Platform offers a variety of Massive Open Online Courses (MOOCs) and training material. <sup>①</sup>

A click on the ‘info’ icon <sup>①</sup> will open a pop-up window with the specific reference. We hope these references encourage you to **dig deeper** into citizen science.



- <sup>30</sup> International Telecommunication Union (2021). Measuring digital development. Facts and figures.
- <sup>31</sup> Aristeidou, M., & Herodotou, C. (2020). Online Citizen Science: A Systematic Review of Effects on Learning and Scientific Literacy. *Citizen Science: Theory and Practice*, 5(1), 11. DOI: <http://doi.org/10.5334/cstp.224>
- <sup>32</sup> Buytaert, W., Zulkafli, Z., Grainger, S., Acosta, L., Alemie, T. C., Bastiaensen, J., et al. (2014). Citizen science in hydrology and water resources: opportunities for knowledge generation, ecosystem service management, and sustainable development. *Front. Earth Sci.* 2:26. doi: 10.3389/feart.2014.00026
- <sup>33</sup> Dwivedi A. K. (2021). Role of digital technology in freshwater biodiversity monitoring through citizen science during COVID-19 pandemic. *River research and applications*, 10.1002/rra.3820. Advance online publication. <https://doi.org/10.1002/rra.3820>
- <sup>34</sup> Li, Z. (2020). Research on Key Competences Needs of Volunteers in Ecological Citizen Science Projects based on Grounded Theory.
- <sup>35</sup> Parrish, J., & Jones, T., & Burgess, H., & He, Y., & Fortson, L., & Cavalier, D. (2019). Hoping for optimality or designing for inclusion: Persistence, learning, and the social network of citizen science. *Proceedings of the National Academy of Sciences*. 116. <https://doi.org/10.1073/pnas.1807186115>
- <sup>36</sup> Queiruga-Dios, M. A., López-Iñesta, E., Díez-Ojeda, M., Sáiz-Manzanares, M. C., & Vázquez Dorrio, J. B. (2020). Citizen Science for Scientific Literacy and the Attainment of Sustainable Development Goals in Formal Education. *Sustainability*, 12(10), 4283. <https://doi.org/10.3390/su12104283>
- <sup>37</sup> Phillips, T., Porticella, N., Conostas, M., & Bonney, R. (2018). A Framework for Articulating and Measuring Individual Learning Outcomes from Participation in Citizen Science. *Citizen Science: Theory and Practice*, 3(2), 3. DOI: <http://doi.org/10.5334/cstp.126>
- <sup>38</sup> Pejovic, V., & Skarlatidou, A. (2019). Understanding interaction design challenges in mobile extreme citizen science. *International Journal of Human-Computer Interaction*, 36(3), 251–270. <http://doi.org/10.1080/10447318.2019.1630934>
- <sup>39</sup> Bowser, A., P. Brenton, R. Stevenson, G. Newman, S. Schade, L. Bastin, A. Parker, and J. Oliver. (2017). Citizen science association data & metadata working group: report from CSA and future outlook. *Workshop report, Woodrow Wilson International Center for Scholars, Washington, DC.*

# 3

## Using Guidelines for Training



# Steps

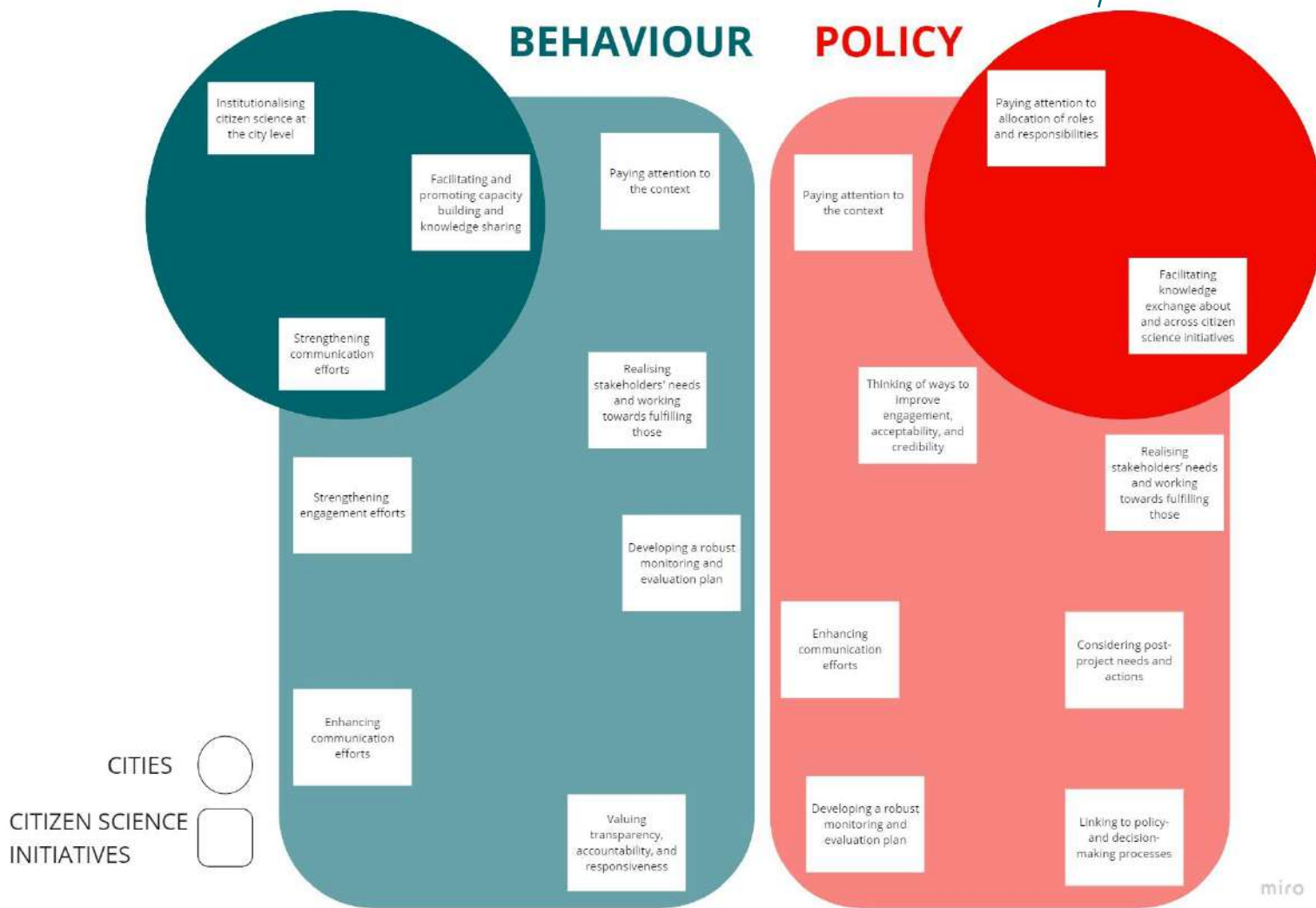
1. Read the guidelines [slides 10-17]
2. Select between 5 to 20 people
3. Run a **needs assessment workshop** (1 hour) [slide 28]
4. Interactive **exercises** (1h – 1h30) [slides 29-35]
  - Role play (Exercise 1) [slides 29-34]
  - Reflect on policy aspects of citizen science (Exercise 2) [slide 35]
5. Following the identified needs and exercises, select key recommendations (X out of 65) and check the examples (if any)

Narrow down recommendations based on **own experiences** of participants.



More instructions on Miro [click]

# Needs Assessment Workshop



The board contains a set of actions needed by cities and citizen science initiatives to boost the impact of citizen science on **behaviour** and **policy change**.

Ask participants to **use post-its** to add the challenges they faced in their initiatives or projects in relation to some (or all) of these actions.

# Exercise 1: Role play

**Behaviour change** = Measurable change in action resulting from engagement in citizen science that lasts beyond the citizen science project itself.

1. Read the following problem statements and choose one of them
2. Pick a role (Ideally, it will be your current role, but you can also choose a different one. Your contributions to the discussion should be aligned with the expected interests of a person in your role or based on your experiences.)
  - Technical staff from the city council
  - Representative of civil society organisations
  - Representative of research organisations
  - Facilitator or collaborator in a citizen science project
  - Politician or policy-makers
  - Private sector
3. Go through the guiding questions and discuss with your team
4. If you have ended your discussion, please choose a new problem statement

## Problem Statement 1

Following the approval of the new EU Ambient Air Quality Directive, the Mayor wants to implement a pilot to measure air pollution in one of the city's busiest avenues.

The city council has bought 50 sensors and is planning to distribute them among interested neighbours for a two-month campaign to measure air quality. The Mayor wants to involve different stakeholders to prepare a plan and make this campaign a success.

This case has been inspired by the [Balbyn'Air initiative](#) in Bobigny.

### Guiding questions/indications:

- How do you find interested participants?
- How do you prevent dropouts?
- How do you ensure participants learn about air quality during the campaign?
- Think about the types of behaviour you would like to influence, and how you plan to do so.





## Problem Statement 2

You (in your chosen role) have been implementing a citizen science project which has been measuring noise pollution for the past six months. It has been observed that young people, especially skaters, are a significant source of noise pollution.

As part of the final phase of the project, you want to run a campaign to raise awareness about this issue and discuss potential solutions.

This case has been inspired by projects such as [Noise Maps](#).

### Guiding questions/indications:

- How can you measure learning effects?
- What would you include in the awareness campaign?
- Who would you involve in the campaign?
- What communication channels would you use?
- Think about the types of behaviour you would like to influence, and how you plan to do so.





## Problem Statement 3

You are applying for a grant of EUR 50,000 to tackle bullying in schools following a citizen science approach.

The main objectives of this project are to understand the drivers of these bad practices and help young people improve their mental health.

### Guiding questions:

- What type of project would you design?
  - Which specific behaviours would you like to encourage and which ones would you like to discourage? How?
- What stakeholders would you like to involve in your project application to increase your chances of getting this funding?
- How do you ensure learning among the students and teachers participating?



## Problem Statement 4

Your city experiences intense heat waves during the summer period. Such extreme weather events particularly affect the elderly and other vulnerable groups.

You would like to use a citizen science approach to address heat stress and protect those who suffer most.

### Guiding questions:

- What could be effective strategies to include the target groups in the project design phase?
- How can you measure the impacts of the project across different groups?
- How would you ensure the long-term sustainability of the project (after its completion)?



## Problem Statement 5

An EU-funded project wants to assess the potential benefits and the main setbacks of neighbourhood electricity sharing.

Households have received a monthly report about their consumption and have real-time access to their energy consumption data. You want to understand how this information is affecting their behaviour and consider these learnings to tackle the energy crisis.

This case has been inspired by the [STEP CHANGE project](#).

### Guiding questions:

- Which specific behaviours would you like to encourage and which ones would you like to discourage?
- How do you plan to do so?
- How do you ensure learning at all levels (from the household to the institutional and societal levels)?



## Exercise 2: Policy aspects

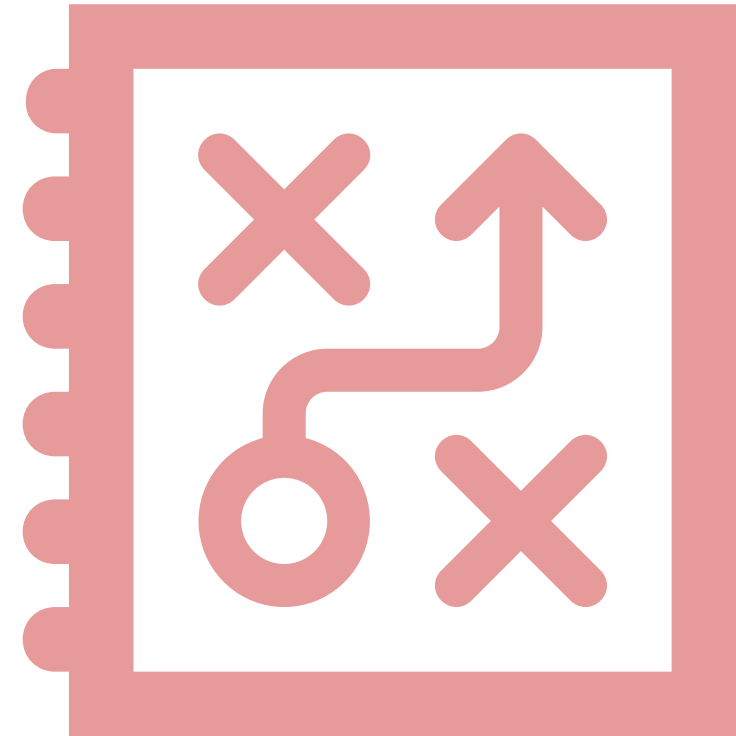
- What are typical **conflicts of interest** between citizen science projects and policy/decision makers?
- How could you better align citizen science **data** and policy questions, objectives, and actions?
- How could you better align citizen science **outputs** with current political structures and processes?
- How can you facilitate **knowledge exchange** among different actors to face the challenge at hand?
- Do you need to change any **legislation** to facilitate the policy uptake of this project?
- How could you increase **trust** between citizen science initiators and policy-makers?
- Are there **constraints in time, resources, and expertise** that could prevent policy uptake?  
How can you best address these constraints?
- How would you **communicate** the project results to the authorities?
- How would you measure the **impact** of the project?
- Are there any **funding**-related considerations that could facilitate policy uptake?





# Steps

1. Read the guidelines [slides 18-25]
2. Select between 5 to 20 people
3. Run a **needs assessment workshop** (1 hour) [slide 37]
4. Exercise on **self-assessment** (1h – 1h30) [slides 38-42]
  - Let participants conduct self-assessment
  - Come back together as a group and discuss
5. Based on the identified needs and self-assessments, select key recommendations (X out of 32) and check the examples (if any)





More instructions on Miro [click]

# Needs Assessment Workshop

Ask participants to assume the role of (1) project initiators/facilitators and (2) citizen scientists.  
Let them indicate which competencies are (a) most relevant and (b) unclear to them.

<b>SKILLS</b>	Scientific research skills	Data management skills	Data science skills	Digital (software) skills	Technical (hardware) skills	Co-creation skills	Transferable skills				
<b>KNOWLEDGE</b>	Understanding of subject matter	Understanding of scientific processes	Understanding of social, political, and economic processes	Understanding of technology	Place-based knowledge	Experience with past projects	Ethics	Governance principles	Legal knowledge		
<b>ATTITUDES</b>	Towards environment and human life	Towards science	Towards citizen science	Towards technology	Towards society	Towards policy	Towards collaboration, participation, and inclusion	Towards change	Self-efficiency	Curiosity	Moral responsibility
											miro

# Self-Assessment

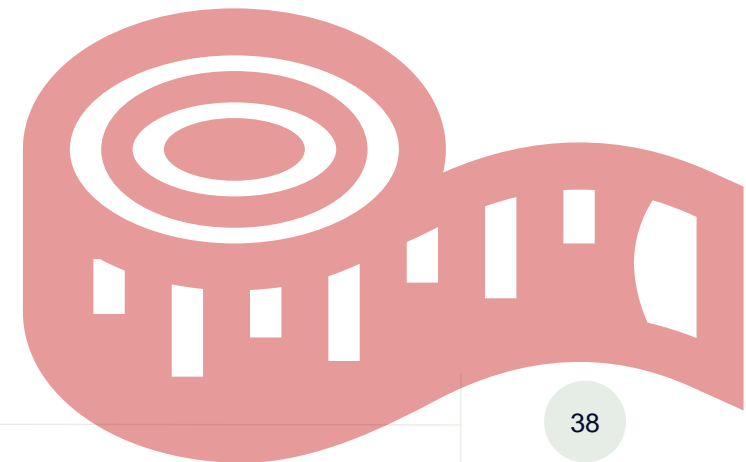
The following self-assessment for participants shall serve as a mere guidance; it is by no means an 'exam.' Nor does it aim to make definitive statements about people's digital competencies.

Please note that the results are no reason for exclusion. By contrast, they shall help project initiators better understand how **strategies for inclusion** can be developed.

For instance, if project initiators find that many participants score low on digital software skills, they might want to think about ways in which these skills can be improved. Or, if few participants have an understanding of 'social justice,' project leaders can work on including principles of transformative action.

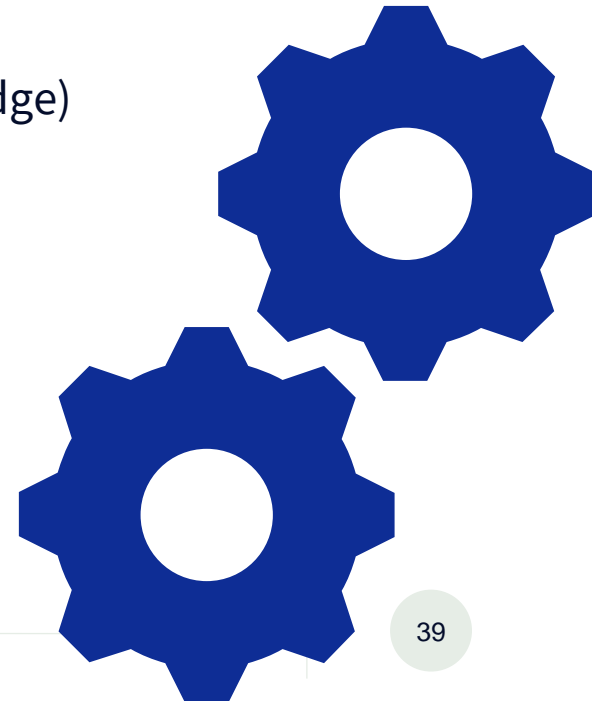
All questions are loosely based on the 27 clusters (see previous slide). We are aware that some of the questions may lead to biased answers.

We do not provide a fixed evaluation form to avoid conveying the message that some participants do not 'qualify' for citizen science projects.



# Self-Assessment: Skills

1. Have you conducted scientific research before?
  - If yes, what tasks have you completed (e.g., literature review, research design, data collection, data analysis, communication)?
2. Have you worked with raw data before?
  - If yes, how large was the dataset? What exactly did you do with the data?
3. Do you own a smartphone or computer?
  - If yes, how proficient would you say you are on a scale from 1 (basic user knowledge) to 10 (excellent coding skills)?
  - If yes, do you have any technical hardware skills (e.g., maintenance)?
4. How comfortable do you feel using technology new to you?
5. Have you participated in community projects before?
  - If yes, in what role? What were your tasks?



## Self-Assessment: Knowledge

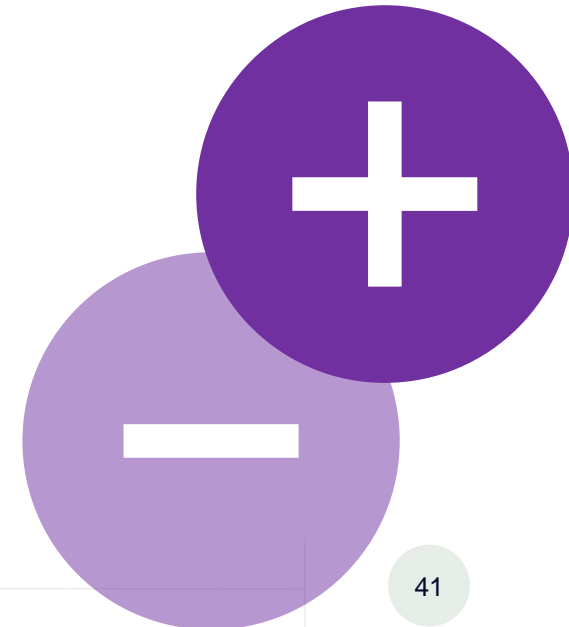
6. Do you have any background knowledge in the fields of wildlife, biodiversity, the environment, geography, biology, hydrology, sustainability issues, or future studies?
7. How familiar, on a scale from 1 to 10, are you with scientific procedures?
8. How familiar, on a scale from 1 to 10, are you with the social and political implications of environmental management?
9. In a scientific project, how well aware are you of available technological tools?
10. How long have you been living in the city or neighbourhood where the citizen project is about to be implemented?
11. Can you think of any ethical issues coming up during citizen science projects?  
Where do you see potential ethical problems or dilemmas?
12. What kind of social justice aspects do you think a citizen science project should address?
13. What legal knowledge do you feel is important when participating in a citizen science project?

Citizen science projects are of course not limited to the environment and can cover all kinds of thematic areas (e.g., culture, mental health, physics, architecture). If needed, this question can therefore be adjusted accordingly.



## Self-Assessment: Attitudes

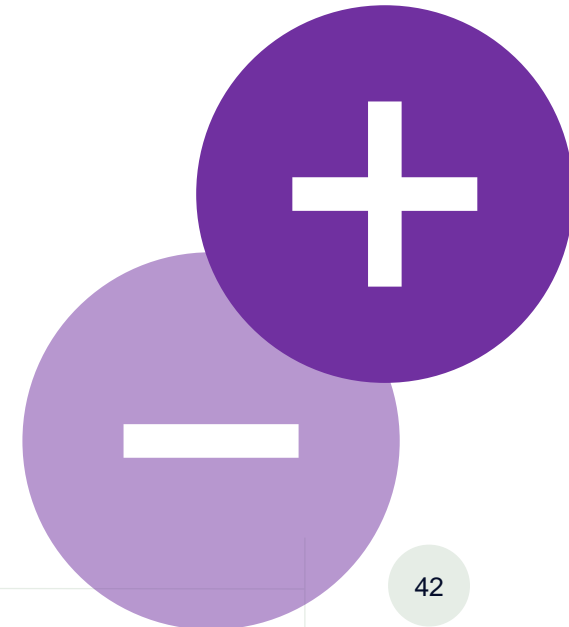
14. How big of a priority is the environment for you compared with other things in your life?
15. How much trust, on a scale from 1 to 10, do you have in science (e.g., when it comes to climate change or global health)?
16. How much trust, on a scale from 1 to 10, do you have in the ability of the general public to get involved in scientific research and issues?
17. How willing, on a scale from 1 to 10, are you to learn about and use new technology?
18. To what extent do you agree with the following statement:  
*“The actions of an individual must benefit the whole of society.”*
19. How much trust, on a scale from 1 to 10, do you have in public authorities?
20. To what extent do you feel that, in collaboration with others, you can bring about change in your neighbourhood?





## Self-Assessment: Attitudes (2)

21. To what extent are you willing to change your everyday behaviour to discontinue unsustainable practices, even if it means renouncing personal comforts?
22. Do you generally feel confident when it comes to completing an individual task or achieving personal objectives?
23. Would you describe yourself as a curious person? If yes, please explain why and provide an example.
24. What common values, norms, and principles do you think we share as a society?



# Access to the Guidelines



Visit <https://citimeasure.eu/> for more information!

# CitiMeasure

Using citizen measurements to create  
smart, sustainable and inclusive cities

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INSTRUCTIONS ON  
HOW TO USE CITIAIR

# What is CitiAIR?

**CitiAIR** is an online inventory of initiatives from all over Europe that empowers individuals to monitor air pollution in their neighbourhood.

The main objective of this online tool is to collect **technical and descriptive** information about cities and citizen science organisations using low-cost sensors and other devices to measure air quality with communities.

A circular graphic containing a blue-tinted, hazy image of a city skyline with various skyscrapers.

ACCESS THE  
TOOL HERE

# 1

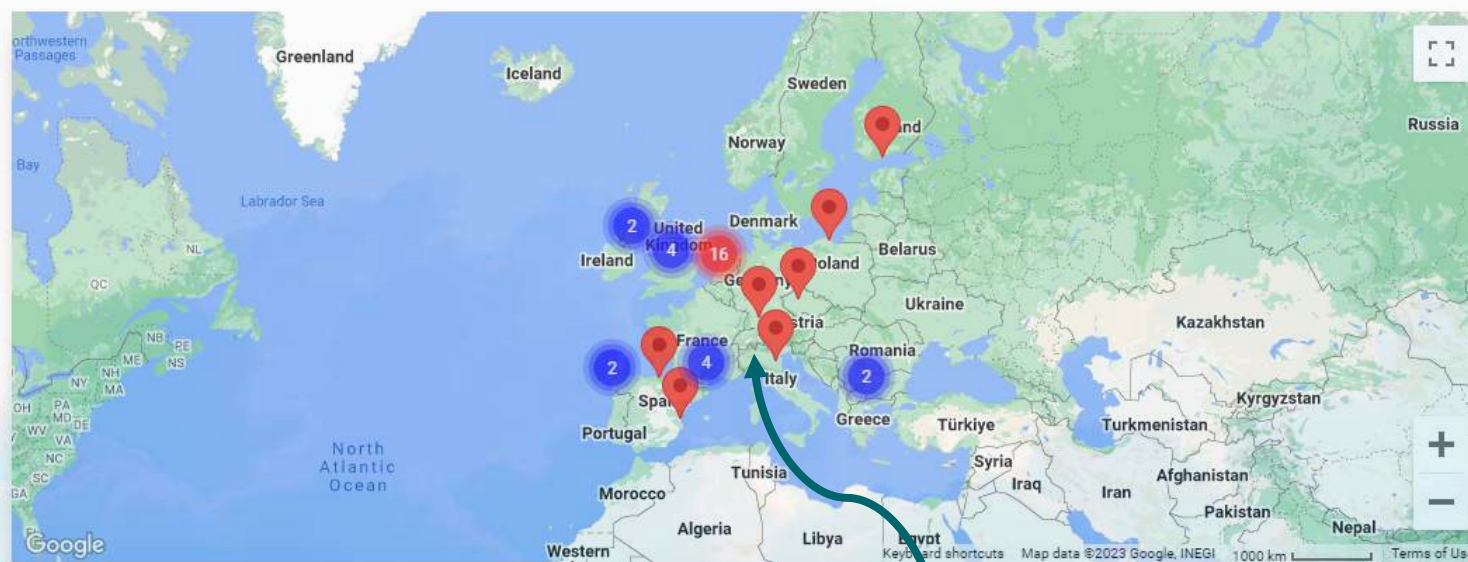
## How to Use the Tool



## Navigation Bar (Option 2)

Navigation Bar (Option 2) components:

- Search bar: Type to search
- Types of organisation: [Dropdown]
- Status: [Dropdown]
- Countries: [Dropdown]
- Parameter filters:
  - All parameters
  - Black Carbon (2)
  - CO2 (7)
  - Humidity (20)
  - NO (1)
  - NO2 (11)
  - Noise (5)
  - O3 (5)
  - Other (9)
  - PM1 (14)
  - PM10 (24)
  - PM2.5 (27)
  - Temperature (21)
  - UFPs (Ultrafine particles) (1)
  - VOC (6)



## Map (Option 1)

# Option 1: Use the Map

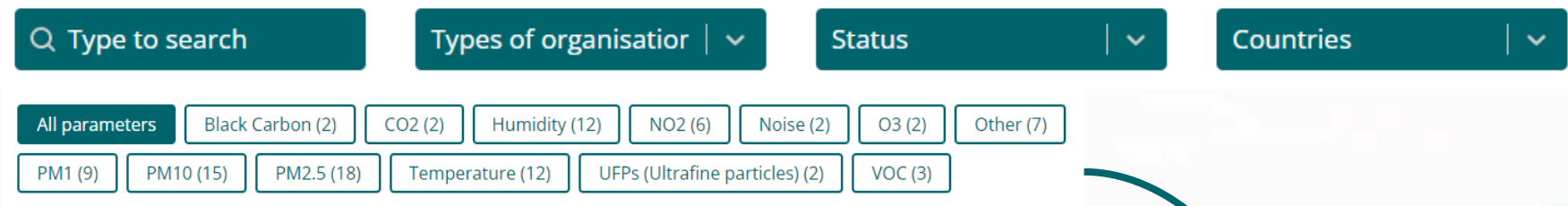
Users can directly access the map and explore different initiatives. These are represented using a **location identifier**.

If numerous initiatives exist in a region, they are **clustered**. This way, users can identify particularly active regions right away.

Once they click on the blue circle, the map zooms in on the respective initiatives. Users can then select the initiative they are interested in.



# Option 2: Use the Navigation Bar



Users can filter initiatives by choosing categories from the drop-down menu where they can sort initiatives by:

- Organisation type
  - City
  - University and/or research institute
  - Private sector
  - Non-governmental organisation
  - Other government administration
  - Other
- Status
  - Ongoing
  - Inactive/ended
- Country [Europe]

Below the navigation bar, different types of pollutant parameters and (thermal) comfort indicators are displayed. Once clicked upon, initiatives measuring the chosen pollutant are shown.

# Search Box

🔍 Type to search



🔍 commuting ✕

<p><b>Air-Break – Co-producing healthy clear commuting air spots in town</b></p> <p><b>Location:</b> Ferrara, Italy</p> <p><b>Description:</b> Air-Break set the ambitious goal of reducing air-pollution by 25% in the most critical areas of the city. The project will tackle air-quality issues through a set of integrated actions along four core strategic fields: Nature-Based Solutions, with the plantation of phyto-absorbing species; Infrastructural upgrades for sustainable mobility. Technological equipment, with the deployment of air-quality monitoring stations, as well as of innovative digital services and gamification applications, towards the incentivisation of environmentally friendly behaviours; Awareness-raising and stakeholders' engagement</p> <p><b>List of parameters measured:</b> PM2.5, PM10, NO2, Temperature, Humidity, CO2, VOC, O3, PM1</p> <p><a href="#">Read more</a></p> <p>October 24, 2022</p>	<p><b>Limp.ar</b></p> <p><b>Location:</b> Guimarães, Portugal</p> <p><b>Description:</b> The Limp.AR project aimed to respond to the need to promote the improvement of air quality and noise in urban centers, seeking to encourage the integration of vegetation in the urban environment and raise awareness of the importance of reducing commuting. The project integrates education, training and awareness actions for citizens, participatory co-creation actions, interventions in urban spaces and actions to assess air quality and noise in different contexts.</p> <p><b>List of parameters measured:</b> Noise, CO2, PM2.5, PM10, Other</p> <p><a href="#">Read more</a></p> <p>February 24, 2023</p>
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Users are invited to use the search box to look for key information among the CitiAIR initiatives. This allows visitors to find what they need faster. In the example here, all projects tackling the issue of clean commuting are displayed.



# Read More

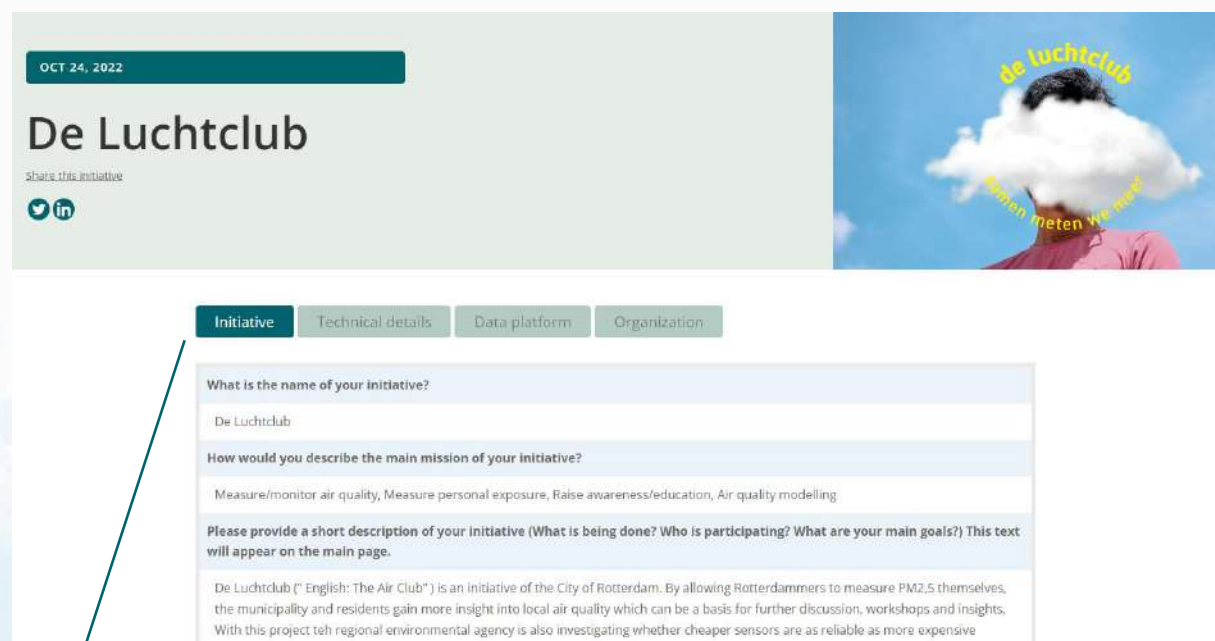
View using navigation bar



View using map



The “Read More” button directs users to a separate page where users can find out more about the respective initiative. The information displayed here is based on the questionnaire the initiatives submitted online.



Users can switch between four different tabs.



# 2

## How to Add New Initiatives

# Share Your Story

## SHARE YOUR STORY

Is your municipality, organization, or company involved in participatory air quality monitoring initiatives? Then we would love to hear from you and to have your story on the map! Please take 20 minutes to fill out the survey to help interested cities and organizations across Europe find you, learn from you, and set up their own project.

[I WANT TO SHARE MY STORY →](#)



Adding a new initiative can take up to 30 minutes.

In the 'Share Your Story' section of the website, organisations are invited to submit their initiatives. Once users click on the 'I want to share my story' button, they are redirected to a new page asking them to fill in the details of their initiative. The questionnaire seeks information about key characteristics of the project, technical details, data use, and contact details.



**Fill in information about your organisation.** Please include a real address so the map can find you!



**Add information about your citizen science initiative on air quality.** Please share your best estimates with the community!



**Add technical details about the equipment used in your initiative.** If there are multiple devices, please repeat this step as often as necessary.



**Fill in information about your data platform and lessons learnt.** Think about what you want to share.



Fill-in time: 30 minutes



Visit <https://citimeasure.eu/>  
for more information





# CitiAIR Submission Questionnaire

## WHAT TO EXPECT IN THE FORM

<b>STEP 1: YOUR ORGANISATION/DEPARTMENT</b>	
First Name:	Last Name:
Email:	Phone:
What is the name of your organisation*?	Website/URL:
<p>What best describes the type of organisation that you are representing?</p> <ul style="list-style-type: none"> <li>• City administration</li> <li>• Government administration</li> <li>• National or International NGO</li> <li>• Community-based / Civil Society Organisation</li> <li>• Private company</li> <li>• Academia</li> <li>• Schools</li> <li>• Other</li> </ul>	
Where are you based? (location)	
City	State/Province/Region
ZIP/Postal code	Country
<b>STEP 2: YOUR INITIATIVE</b>	
<i>The initiative should have involved citizens (directly or indirectly).</i>	
What is the name of your initiative*?	
<p>How would you describe your initiative's mission?</p> <ul style="list-style-type: none"> <li>• Measure/monitor air quality</li> <li>• Raise awareness/education</li> <li>• Commercialize air quality sensors</li> <li>• Measure personal exposure</li> <li>• Advocate for air quality policies</li> <li>• Air quality modelling</li> <li>• Smart/sustainable mobility</li> <li>• Environmental justice</li> <li>• Other</li> </ul>	
Please provide a short description of your initiative? Who is participating, who is your target audience...? [max 80 words]	
<p>Who is your main audience?</p> <ul style="list-style-type: none"> <li>• Citizen</li> </ul>	



<ul style="list-style-type: none"> <li>• Private sector</li> <li>• Association</li> <li>• Media</li> <li>• Schools</li> <li>• Other</li> </ul>	
<p>What is the context of the initiative creation?</p> <ul style="list-style-type: none"> <li>• EU-funded project</li> <li>• Municipality programme</li> <li>• Association initiative</li> <li>• Private programme</li> <li>• Other</li> </ul>	
How much budget does this initiative represent?	What is the duration of the programme?
How many participants are involved?	Website that presents your initiative
<p>Please upload a picture to illustrate your initiative</p> <p>Choose file</p> <p>Accepted file</p>	
<b>STEP 3: ADD EQUIPMENT DESCRIPTION</b>	
Name of the new equipment	Brand (if the same as name, just copy-paste)
Number of devices used in your initiative	
<p>Origin:</p> <ul style="list-style-type: none"> <li>• Commercial product</li> <li>• DIY product – we bought parts</li> <li>• DIY – from a dedicated provider</li> <li>• Innovative sensor: we have created the device</li> <li>• Other</li> </ul>	
<p>Measure parameter (you can select several):</p> <ul style="list-style-type: none"> <li>• PM1 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• Temperature – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• COV – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• CO2 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• PM2.5 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• Humidity – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• O3 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• H2S – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• PM10 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• NOx – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• SO2 – Unit/Technology/ Range of measurement/Service life/Detection limit</li> <li>• Noise – Unit/Technology/ Range of measurement/Service life/Detection limit</li> </ul>	

<ul style="list-style-type: none"> <li>• New option – Unit/Technology/ Range of measurement/Service life/Detection limit</li> </ul>
<p>Specific questions:</p> <p>Connectivity/units/resolution/service life</p>
<p>Communication type:</p> <ul style="list-style-type: none"> <li>• Datalogger</li> <li>• 2G-3G</li> <li>• Bluetooth</li> <li>• Lora-SlgFox</li> <li>• Wifi</li> <li>• Ethernet</li> <li>• Other</li> </ul>
<p>Energy type:</p> <ul style="list-style-type: none"> <li>• Solar</li> <li>• Not relevant (passive tubes for example)</li> <li>• Battery</li> <li>• Regular power plug</li> <li>• Other</li> </ul>
<p>Temporal resolution:</p> <ul style="list-style-type: none"> <li>• 1 second</li> <li>• 1 minute</li> <li>• 5 minutes</li> <li>• 10 minutes</li> <li>• 1 hour</li> <li>• 2 hours</li> <li>• Day</li> <li>• Week</li> <li>• On threshold/alert</li> <li>• Other</li> </ul>
<p>Where are you measuring air quality?</p> <ul style="list-style-type: none"> <li>• Indoor</li> <li>• Outdoor</li> <li>• Both</li> </ul>
<p>Device's location:</p> <ul style="list-style-type: none"> <li>• Street – public domain</li> <li>• Mobile – bike mounted</li> <li>• Home</li> <li>• Street – private domain</li> <li>• Mobile – person mounted</li> <li>• Public building</li> <li>• Mobile – car mounted</li> <li>• Mixed</li> </ul>

<ul style="list-style-type: none"> <li>• Other</li> </ul>	
<p>Level of expertise required to operate:</p> <ul style="list-style-type: none"> <li>• Simple if you take time to read the documentation</li> <li>• Takes some advanced skills – digital native</li> <li>• Must be an expert – requires special training</li> </ul>	
<p>What is the price per unit?</p>	
<p>Any setup/installation costs?</p>	
<p>Are there maintenance costs?</p>	
<p><b>STEP 4: DATA PLATFORM AND STORIES</b></p>	
<p>Are you using a platform for data visualisation?</p> <ul style="list-style-type: none"> <li>• No, we manually process the data (csv, excel, ...)</li> <li>• Yes, we use the platform provided by the equipment manufacturer</li> <li>• Yes, we connect to an information data viewer provided by a third party (GIS, digital twin, ...)</li> <li>• Yes, we have created our own</li> </ul>	
<p>Add the public URL (if any)</p>	<p>Is your platform open source?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
<p>What are the related costs (subscription if any, development costs...)</p>	
<p>Are you providing open data?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<p>How are the data made accessible?</p> <ul style="list-style-type: none"> <li>• The data are NOT made accessible</li> <li>• Export (csv, geojson..)</li> <li>• API</li> <li>• Other</li> </ul>
<p>If any, what indicators (e.g., AQI, alerts...) are you calculating?</p>	
<p>How frequently is the data refreshed?</p>	
<p>How long does it take before the newest data is available on your platform?</p>	
<p>Do you give access to historical data?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	
<p>Have you considered GDPR regulation and if so, how?</p>	
<p>What type of data visualisation do you provide?</p> <ul style="list-style-type: none"> <li>• None</li> <li>• Statistics / Indicators / Charts</li> </ul>	

- Map
- Both
- Report
- Other

Would you like to share with us any additional information?

You can share with us any lessons learnt, challenges you faced in your initiative, and potential solutions. This qualitative information can be of great value to other cities and organisations.

PREVIEW/PDF

FINAL SUBMISSION