D4.3 – Report on Living Lab Experiment Brussels
WP4 – Action Research in smart Living Lab experiments

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## Document Description

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### Objective

The SmarterLabs project aims to develop a Smart City Living Lab approach to effectively deal with two major risks to successful, widespread implementation of smart transport technologies. These two risks concern (1) unforeseen barriers to large-scale change in socio-technical systems, and (2) exclusion of social groups not matching the required ‘smart citizen’ profile. This novel, ‘smarter’ approach will be developed, tested and refined by retrospective analysis of urban mobility governance and by action research in Living Lab experiments in the cities of Bellinzona, Brussels, Graz and Maastricht.

### Website

[http://www.smarterlabs.eu](http://www.smarterlabs.eu)

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Introduction

The Brussels Living Lab took the form of a platform of cooperation between the Cosmopolis Centre for Urban Studies of the VUB, the civil society organisation BRAL-Citizens Action Brussels, and various groups of citizens, aiming to better understand the problem of air pollution in Brussels, and to work together toward a cleaner air. In line with the broader objectives of the SmarterLabs project, the Brussels Case Study also served as an opportunity to test a Living Lab methodology, against its capacity to mitigate the risks related to the exclusion of social groups not matching the ‘smart citizen’ profile and to unforeseen barriers to large-scale change in socio-technical systems. This document provides an account of how the living lab unrolled, and a reflection on how the risks of social exclusion and limited upscaling were interpreted and dealt with in the Brussels context.

Part 1 - Brussels Living Lab: AirCasting Brussels

1. Overview

The broad elements of the AirCasting Brussels methods were developed in the course of 2016 combining our experience, perspectives and expectations of civil society workers and researchers, and include i. to get to know, ii. to let others know, and iii. to jointly reflect on the process. These three elements, closely connected with one another, were proposed to different groups of citizens, and adapted to the group character, interests and objectives. To avoid forcing the complex and diversified realities of civic mobilisation into a predetermined box, we chose to blur the contours of the project and use it to provide a toolkit to learn about air pollution, do something about that, and jointly make sense about the ongoing processes and dynamics. In some cases, the AirCasting experience followed a precise methodological approach, in other it was combined with existing projects and activities; in other, the project did not take off and remained at the level of individual experience. Notwithstanding the differences between the groups, we chose to account only for the groups which:

i. were involved in air pollution measurements
ii. participated in regular discussions to share their experience
iii. carried out at least one initiative building on the results
iv. participated in a methodological reflection about the project

The Living Lab was officially launched on in March 13, when the project was presented to partners and the public (this event was reported upon on Activity Report #1). At the time we write, some of the groups have already concluded their experience, some are still active on measuring and addressing air pollution, some are working on different priorities.

In this document we cannot (and we do not want to) provide a thorough account of all of initiatives that directly and indirectly originated from AirCasting Brussels, of their impacts and implications, nor a series of best practices to be replicated. Rather, we want to provide some snapshots of how the AirCasting project unrolled in ‘real life’ and tell the stories and trajectories of many people and communities that have joined us in the last 3 years. It should also be emphasised that, while the AirCasting project was in many cases a trigger for initiatives presented below, by no mean these can be reduced merely as outputs of the project: at best, they are the result of a joint effort and the ‘ownership’ and the merit remain with the group that has carried them out. What we present here is not exhaustive and more can be found on the internet, the news, social media or by asking to the group members.

2. The participants
Building on BRAL experience with community organisation, different calls for participants were carried out so as to establish groups of citizens scientists. Albeit open and interactive, it was clear from the beginning that it would be virtually impossible (and anyway rather artificial) to involve in the Lab a ‘representative’ sample of Brussels population. This is why we decided to look for a ‘meaningful’ sample of people and groups, emblematic of different socio-economic and cultural context, different personal geographies and everyday mobility practices.

The calls for participants, moreover, did not follow a narrow top-down approach, but built on existing opportunities and responded to bottom-up demands for collaboration. In other words, rather than making remaining limited to formal calls for participants, we decided to engage in dialogues with community organisers, i.e. with individuals that could help establishing a group of friends and colleagues interested in participating in the project. In some cases, these collaborations started from the lab organisers, in other cases they were a response to people request to engage with air quality and citizenships questions. Throughout the project particular attention was paid to be inclusive of all possible groups and communities and adapt the working plan accordingly.

Examples of calls for participants include:

- Call for participants from centres for underprivileged residents of Brussels city (neighbourhood houses, medical centres and other social projects). The call was done through the centres’ existing structure, meeting different groups separately first, and convening a single group after.
- Call for participants through the Brussels citizens movement “Bruxselair”
- Call for participants through the European Union Cyclists’ Group (employees of European institutions interested in urban cycling)
- Call for participants through the neighbourhood committee Chants d’Oiseaux Quartier Durable, and Ixelles north
- Call for participants through schools’ committees of parents (Chants D’oiseaux, Groene School, Arc-en-ciel Bempt, Helmet, Saint Ursula, Sint Lukas, Saint Josse Aan Zee, Kakel Bont...)

It should be noted that such an approach allowed to reach out much more people and groups than initially expected and led to the mosaic of activities related to the Living Lab, but only partially replicating its methodology, as mentioned above. Following the call and the engagement with different communities we started to work with the following groups

- **European Union Cycling Group**
  EUUCG is a staff association of employees of the EU institutions, with over 20 years of history, more than 2000 members, and the general objective to encourage the daily use of bicycles by all staff of the Institutions of the European Union ([www.eucg.eu](http://www.eucg.eu)). Some 15 members of EUCG took part in the project, with meetings convening at lunch time within or nearby the EU facilities.

- **Minibxlair**
  The MINIBXLAIR is a group issued from the Bruxel’air, a Brussels based citizens movement fighting or a better air through awareness raising activities and political pressure, initially born from the expAIR project ([www.bruxselair.org](http://www.bruxselair.org)). While Bruxel’air members supported the initial call for participants and participated in the first meetings, the Minibxlair later developed its own identity, project and objectives. Some 20 people participated at different stages of the project, with a shared background of activism and attention to sustainable lifestyle.

- **Chant d’Oiseau quartier durable - COQD**
  The Chant d’Oiseau quartier durable is a neighbourhood committee active in commune of Woluwe-Saint-Pierre. The members engaged with AirCasting Brussel with the objective of supporting through air quality data their advocacy with the local government for a better mobility (e.g. including slower traffic, better pedestrian network...). The group met for a few times for some
measurements and ateliers, but it remained rather small scale, given the other activities and priorities of the committee.

- Hawa Fi Molem
  Hawa Fi Molem is a group issued from the Maison Medicale Médecine pour le Peuple / Mollembeek of Mollembeek, with the objective of understanding and dealing with socio-economic determinants of vulnerability. The group, consisting of some 25 people, among patients, doctors and other staff, and residents of the neighbourhood, was probably the one presenting the highest degree of socio-economic and ethnic diversity.

- School Groups
  The AirCasting project was proposed to different groups gravitating around one or multiple schools, mainly through the parent committee. In the school context, the AirCasting project intersected with the many activities around air quality and mobility that started before, during or after AirCasting. These included the FilterCafeFiltre movement (filter-café-filtré.be) and the project Mon Air Mon Ecole (www.monairmonecole.be). All these activities contributed to a growing mobilisation of parents, children, and school staff, including different forms of air pollution measurement, creative awareness raising, political pressure, and re-appropriation of the public space in front of the street. Participating schools include Sint Joost aan Zee, Kakel Bont, Saint Ursula, Helmet- Heilige familie, Sint Lukas, Arc-en-ciel, Groene School.

3. To get to know: discovering the complexity of urban air pollution

Our approach

This component aimed to have lab’s participants getting a shared understanding of different issues related to air pollution, through a citizen science methodology. This allowed, on one hand, to back the participation of citizens to urban democracy with a process of collective learning; on the other, to strengthen the quality of the research and its societal relevance by the collaboration between researchers and citizens, in the definitions of the objectives and in the co-creation of knowledge.

Concretely speaking, participants were invited to jointly formulate and respond to questions such as: where are the hotspots of pollution in our neighbourhoods? What are the moments during the day where we are the most exposed? How can we reduce exposure and protect our health? What are the implications of pollution in people daily life? To answer to these (and other) questions, the Lab proposed to interested citizens to organise themselves in groups (i.e. communities of interest including for instance parents of the children of a certain school, neighbours, committees, colleagues, member of local association...), and to participate in a series of workshops for 4-5 months facilitated by BRAL and Cosmopolis. During the workshops, participants were encouraged to share their experience and interests, ask questions on relevant issues and try to respond jointly.

Participants were provided with AirBeam portable devices to measure air pollution, connected via smartphone to the online crowd map www.aircasting.org. The system proved to be particularly effective as it allowed participants to ‘visualize’ immediately pollution, as well as to easily tag the sessions depending on the activity (commuting, at home, on a bike, with children...). Several hundreds of measuring sessions were taken by participants, virtually covering the whole regional territory, with more than 1.5million data points. Thanks to the shared tagging protocol, the data are organized in a way that makes it possible to create different sorts of exposure maps (e.g. Brussels pollution, as experienced by children, by bikes, by commuters...). A questionnaire was also developed to gather the basic profile of participants, and possibly monitor existing patterns of exclusion or of sampling bias. The information would also be useful to complement the data on PM 2.5, and provide thicker
description of individual exposure and vulnerability. The questionnaire, though, was only completed by a section of the project participants.

**Stories from the field**

This component was given a different weight (and time) by the various groups, developing more or less specific inquiries. For the Minibxlair, for instance, the “getting to know” part of the project was predominant, and the group developed a series of ‘self-portraits’ illustrating personal exposure in the course of a typical week (e.g. at home, at work, in transport...). The EUCG chose to focus on the commute to work, with sub-questions such as the difference between transport modes, and the between “quick” or “clean” itinerary. The measurements showed the wicked nature of the choice of residence: while living in the suburbs might grant better air at home, it also implies more exposure during the longer commutes.

The measures taken by the school groups reflected the shared interest for the quality of the environment in the schools and in proximity of the schools. Most groups, for instance, participated in a campaign of intensive measurements being conducted in February 2018 in many different schools. The main lesson from that campaign was that the time variation of PM concentration was more important the location, with a morning pollution peak appearing in all schools at children drop-off time. The Sint Joost aan Zee school also started to collaborate with the municipality in the context of pilot testing a School street, and -among other things- used the AirCasting citizens science approach to measure the air quality impact (see BRUZZ.be). The Kakelbontschool, in Laaken, conducted different measurements including a school crowd map, the pollution level through a typical day, or during a bike ride in a park nearby. The “air & mobility” working group of the parent committee, moreover, replicated the citizen science approach in other sectors, including a school-wide mobility survey and different car counting sessions.

Hawa Fi Molem and the Chants d’Oiseaux Quartier Durable groups mainly focused on mapping their own neighbourhood and exploring the pollution levels during the day-to-day of participants. The COQD, in particular, admitted a certain surprise vis-à-vis the findings that seemed to indicate that the air quality can be sometimes worse in the park or in the ‘venelles’ than on the big streets (at least for PM2.5), with the weather playing a much greater role than location. Albeit preliminary, and limited to one pollutant, such results showed how mobilising (citizen) science for advocacy purposes is not always straightforward and should be part of a broader reflection. While meaningful to make visible pollution, these experiences were important to educate to the complexity of the air pollution problem, beyond the questions and answers it can contribute in raising.

**4. To let others know: from knowledge to action**

**Our approach**

The workshops were also an opportunity to jointly design and organise concrete follow-up ‘actions’, based on the lessons from the measurement campaign. The basic idea was to ensure that the learning process undertaken by the lab’s participants would be useful for their broader communities too, in terms of new knowledge and understanding about the issues of pollution, of greater awareness of the urgency to act, and of ideas and solutions toward a healthier and more liveable city.

Possibilities that were proposed to participants, included the organisation of public events to share-experience and raise awareness, (creative) mediatisation of the results, discussion with public officials and decision makers, pedagogical activities for a wide diversity of audiences. From the onset, it was decided to maintain this component relatively flexible and have discussions within each of the groups to decide the specific follow-up activity, given the context the group operated and the findings from the measurement campaign.
Overall, we have reasons to believe that AirCasting Brussels contributed significantly to the growing #BXLdemandscleanair movement, by empowering numerous citizens through a better understanding of the air quality problems, strengthening community bonds and collective actions, generating relevant knowledge and yet-to-be-answered questions, and raising the political demand and the ambitions for a cleaner air in Brussels. The ‘actions’ directly connected to the project include the organisation of public events to share-experience and raise awareness, (self)mediatisation of the results, discussion with scientists, public officials and decision makers, pedagogical activities for a wide diversity of audiences. In addition, all participants told us of the countless individual discussions with friends, family, and passersbys, often started thanks to the portable device carried by participants, which triggered the curiosity of the people around.

**Stories from the field**

Here again, every group took a different trajectory. The Minibxlair members collectively edited a scientific paper, emphasising -among other things- the potential of the so-called ‘extreme citizens science’, i.e. an approach whereby professional and citizens scientists work together during all phases of a research. Part of the research was already published in a scientific magazine ([toxicnews.org, 2018](http://toxicnews.org)), in a blogpost ([lanomadesedentaire.be](http://lanomadesedentaire.be)), and on the news ([alterechos.be](http://alterechos.be)). The main action organised by the EUCG was a conference within the framework of the EU VeloMay 2018. During the conference, the participants shared their experience and the lessons they learned from the project. Dr. Evi Dons, from the University of Hasselt, was also invited to make a presentation to respond to the interrogatives emerged through the project. The experience of this group was also illustrated in different newsletters circulated to thousands of readers. The COQD organised the screening of the documentary “Irrespirable”, followed by an intervention of BRAL, the local alderpersons for mobility and for the environment, and a public debate.

The school groups organised a whole range of activities within and outside the schools, such as organising information events for the parents committee, and activities linked to the FilterCaféFiltré movement on Friday morning in front of the school (e.g. closing the street, music, soap bubbles, distributing black-lungs pins and other communication material, filling the street with steam...). The group at the Kakelbond school was a particularly active one. Among other things, the group disseminated air quality maps during formal and informal gathering of the parents. During the mobility week, also, the group set up a *Speelstraat* in front of the school, by closing off the street every day from 7am to 5pm (with the permission of the municipality). During the same week, the group organised a competition to encourage teachers to leave at home their car, and rewarded the winner with a homemade meal. 3-D zebra crossing were also painted in front of the street to reduce traffic speed (In the press: VRT & BRUZZ). In the south of Brussels, parents from the Arc-en-ciel school and Groene school coordinated among themselves and organised two awareness raising mornings, picked up by the press ([La Capitale](http://lacapitale.be)), and participated actively to different public meetings concerning the redevelopment of the neighbourhood. The experience of the group at the Sint Joost aan Zee school is also interesting, inasmuch as they decided to work systematically in three different directions, namely inclusion, measure, and outreach.

The Hawa Fi Molem made a big outreach effort, toward the patients of the Maison Medicale, neighbourhood residents, and other Maison Medicales. The group members actively reached out to both French and Dutch speaking schools, making themselves available for different kinds of educational and awareness raising activities. Different public events were also organised within the Maison Medical and in the public space to discuss air pollution, from a medical and socio-political perspective, with reflections echoing the broader debates on the Right to the City and on socio-environmental justice. Thanks to the activities of Hawa Fi Molem, the Maison Medicale also started to display real-time pollution levels in the waiting room, proving to be a pioneer in the field.
5. Thinking together: a joint reflection on the process

As the name suggests, Living Lab has to do with experimentation, which implies combining the action research exercise with a reflection on the individual and collective experiences, on the overall process, and on the results. The objective was precisely to get the most from the experimental settings of the living lab and get a thorough understanding of participant perspective and experience throughout the project. Facilitated by Cosmopolis in continuous dialogue with BRAL and the citizens group, this reflection also feeds a broader scientific inquiry on politics and knowledge of air pollution.

In line with the theoretical approach of the living lab illustrated in WP2, the reflection was conducted along three structuring areas: the participants, the learning process, and the methods. The first area included reflections on the socio-demographic characteristics of the project participants, on their motivations and objectives, and on existing barriers hindering participation. The second concerned the lessons that the participants learned by participating in the project, both in terms of their exposure to air pollution and more broadly in terms of the role of citizens in scientific and political production. The third area consisted in a meta reflection on the methodology itself, namely on the experience of participants through the project.

Practically speaking, the reflection took place during a series of focus group interviews, in-depth interviews, facilitated workshops and a ‘collective intelligence’ exercise, all of which allowed to gather the perspectives of individual participants, as well as the ideas generated through group exchange. By nature, this component takes time and can only be completed from a retrospective point of view, with some distance from the project. At the time we write, the last interviews are being made and transcribed, and we look forward to share the results of the reflections in the near future.
Part 2 - The SmarterLabs challenges for the Brussels Living Lab

As mentioned above, the project aimed to test a Living Lab methodology, against its capacity to mitigate the risks of social exclusion, and those stemming from unforeseen barriers to large-scale change in socio-technical systems. In this section we build on our ex-ante reflections on exclusion and upscaling illustrated in WP2, to set the basis of the following sections where we will illustrate how the lab was conducted in relation to these issues.

6. Social exclusion as a risk for Living Labs

The Brussels Living Lab shares with similar participatory approaches to knowledge production and policy co-design the risk of excluding certain groups from the lab, and certain people within the lab. In fact, while one of the principles of these practices is the democratisation of science through broader inclusion of groups and stakeholders, how this materialises is not always straightforward. Exclusion can be the result of certain barriers unwillingly preventing some groups to fully participate, or of an explicit choice at the project design level.

For instance, it has been highlighted that citizens who volunteer to participate in citizen science projects often come from an educated middle class, possibly because of issues of motivation, available time, access to technology (e.g. smart phones), and more in general intellectual and financial resources (Haklay, 2013). Given that personal motivations play a key role in people’s participation to a project, it can also happen that due to mismatching motivations between a participant, other participants and the project organisers constitute a barrier to broad inclusion.

On a different level, it ought to be noted that a project never takes place in the vacuum: the choice of participants and groups of participants might depend on existing networks (e.g. project designers might prioritise groups which they already know), and/or on the presumed feasibility of working with certain groups or with others. It was noted, for instance, that researchers tend to prefer to work with university-educated individuals, since they are more likely to provide accurate data (Connors, Lei, & Kelly, 2012). Another potential source of exclusion concerns the political and ideological bias that are implicit in the project objectives, which might result in (self)exclusion of non-likeminded individuals and groups.

Considering both the literature and the brussels context we envisioned different possible barriers to social inclusion including 1) the lack of resources to participate in the Lab (e.g. financial, temporal, intellectual resources), 2) to the (self-)exclusion of groups having objectives and motivations not matching the project expectations (among other see ENoLL, n.d.). In addition to these, another key issue seems to be related to the overlap of multiple scales of analysis and of operation, resulting in a complex constellation of actors (e.g. residents-vs.-commuters, local-vs.-regional institutions). The differences in the nature and in the stakes of these actors, indeed, might be an obstacle to the inclusionary purposes of the Lab.

Exclusion due to lack of resources to participate in the Lab

Efforts to minimise exclusion were at the core of the process since its early beginning. Different adjustments were also made in progress, considering unexpected circumstances.

At very early stages, the Lab organizers reflected together to identify potential barriers to inclusion, and decided to establish different sub-groups, precisely to include the broadest variety of population. Throughout the process, regular reach out efforts were made toward groups at potential risk of exclusion. The role of focal person for the individual groups, was given to the most suitable person (depending on language skills, residence, family situation, work experience...), and the different workshops were designed depending on the different type of participant.
A key element, for instance, was the strategic choice of venues and schedule for the different groups: for EU officials, meetings were convened in the EU premises at lunch time. For groups of parents and shop keepers, small meetings were organised in the early morning, just after leaving the children in school/just before opening the shop. For young professionals, meetings were organised at early evening in a central neighbourhood.

Several smartphones were purchased to ensure that those who did not have one, could still take part in the lab. Tablets were also purchased, to serve as pedagogical device and to be used for demonstrative purposes. The groups/people least acquainted with the use of smart technologies where dedicated more time to be trained. In some cases, it should be noted, the time dedicated by the LL facilitator was not enough to bridge the gap, resulting in participants not using the technology.

Exclusion from the lab was also part of the reflection that the participants engaged in. Both through focus group interviews and individual interviews, they were invited to identify potential drivers of exclusion, the possible implications, as well as suggestions for coping strategies.

**Exclusion due to the overlap of multiple scales**

In the Brussels Living Lab, the citizens place of residence was one of the most solid barriers to broad inclusion. In particular, the city is characterised by a great inflow of workers commuting in and out the city from the metropolitan area. These commuters are immediately impacted by air pollution in the city, and largely contribute to it. At the same time - with some exceptions- the Living Lab failed to include them in the activities because of lack of time and resources to identify suitable locations at the urban periphery, and because of relatively lower concern for the issue at stake (i.e. widespread perception that suburban living is less impacted by air pollution).

Given, its main focus (i.e. air pollution) the Brussels Living Lab was characterised by the overlapping presence of multiple scales. To minimise exclusion based on participants’ Brussels Living Lab, different arrangements were made. To begin with, the Living Lab ateliers were held in different locations, depending on the participants’ place of residence and employment. In one case (group of parents of children at school age), the group was split in two, based on the location of the school, and the information between the groups was constantly being relayed by the Lab facilitators. These included places throughout the regional territory. In one case (EU officer citizen group), rather than building the group based on place of residence, it was built based on the shared place of work. To do so, it was chosen to meet during office hour at the office location: this allowed for participation of people living in many different locations to interact around common questions. It also allowed to have a discussion on different scales: while it started from a concern about the air at place of work, it soon included the commute, and finally their place of residence.

Despite the outreaching efforts, the Lab was eventually not successful in including participants from all neighbourhoods of the region, nor participants living outside of the regional borders. To complement for this shortcoming, constant efforts of networking and coordination with other organisations were made, to share good practices and lessons from the lab: by experience sharing with organisations in nearby cities, the conditions were created for replication in other contexts.

**(Self-)exclusion of groups with motivations not matching the project expectations**

In Brussels, Lab activities have been coordinated from the onset with the broader citizen movement for a cleaner air in the city. To begin with, an initiative for ‘Smart Mobility’ was immediately reframed by the local partners as one where air quality and people health were at the core. Adopting the right problematization approach favoured raising commitment also in those citizens who would not voluntarily engage in a smart mobility-related process, perceiving the topic as outside their own priorities. Instead, they genuinely and very proactively engaged in an air pollution-related process, since their cared for their health, and especially the one of their kids. Reframing the focus of the Living
Lab helped reaching out to a rather broad variety of citizens, with different geography, and socio-economic, demographic, cultural background. Overall, though, participants could not be considered as a representative sample of Brussels population, being the educated and socially active middle class overrepresented as opposed to other groups.

From very early on, in addition, the Lab initiators (the local university and a citizen movement) engaged in an open dialogue with all stakeholders active on the topic, contributing to establishing both platform for discussion for all civic movements active for better air, and a network of researchers working on air quality and citizen science. Both efforts contributed to reaching out to a broad audience and ensure that the Smarter Lab was immediately part of a broader discussion.

Throughout the process, finally, the Living Lab was fully co-conducted by the project partners and by the various groups who decided to join: while the broad structure was proposed by the organiser (i.e. getting to know pollution, letting others know), different groups decided to fill it in in different ways, e.g. by raising different questions (e.g. the level of pollution in school, while commuting, throughout the day...), and identifying different communication forms (i.e. a citizens science paper, a public conference with experts, creative ateliers ...).

7. Changing the city: barriers and constraints to Living Lab upscaling

Whilst conceptions of upscaling often differ, we conducted the Brussels Living Lab with a broad understanding of spatial and institutional upscaling. The ideal “upscaled” scenario of the Living Lab would possibly be one where participatory sensing of air quality is adopted at a city-wide scale, virtually engaging all urban residents or a representative subset thereof, and where the knowledge produced in this way became a collective resource for the governance of the city’s mobility system.

Therefore, upscaling is envisioned as a process; one through which new practices, in this case participatory sensing and knowledge co-production, move beyond an initial geographical domain and into an institutional context. Drawing insights from transition studies, this interplay between resistant institutions and mobilizing practices/actor sets becomes an important site of attention. Although often regarded as reciprocal in nature rather than a unilateral dynamic, the Brussels Living Lab focuses on co-producing knowledge and mobilizing actors, in a distinctly urban context that can lead to a re-orientation of current structures related to mobility and air pollution.

With these premises, the analysis of the venues for and of the barriers to upscaling could be done at two different levels, namely at the level of the generation of knowledge, focusing on the spread of the SmarterLabs approach to air quality measurement, and/or at the level of the policy process, i.e. on how the projects feeds it. In particular, the analytical part of the project focused on the barriers that prevent the widespread appropriation and “use” of the knowledge produced within the Living Lab by actors who were not directly involved in it. More broadly, this analysis would relate to the broader debate on the role of knowledge in urban governance and on the perceived and actual value of citizen science for decision makers.

Coping strategies from the Brussels Living Lab

AirCasting Brussels took from rather early stage a much broader proportion than initially foreseen. The Living Lab activities articulated and expanded in different fields, and many of them are still ongoing. This implies that while a process of upscaling is taking place, there isn’t yet the adequate distance to analyse and understand the full proportion of the process. Further research is needed to understand the potentials and limits of citizen science for a governance that is citizen-centred, cooperative and supported by innovative technological solutions. Similarly, it is premature to provide any insights on the barriers to successful upscaling. At the same time, we chose to illustrate below how we strived to scale up the living lab, as an approach both to democratize science and to democratize the governance of the city.
Since March 2017, we convene a Belgian network of researchers to bring together researchers looking at air pollution from a wide range of different perspectives and disciplines, including environmental science, public health, urban governance, law, mobility... The network gives researchers an opportunity to update their colleagues about their work (current or future), learn from each other areas of expertise, share experience and data from relevant projects, network and identify possibilities of cooperation. By doing so it contributes to the growing debate on air pollution in Brussels and in Belgium, in a historical moment in which air pollution is a topic of increased interests for citizens and authorities, and in which traditional forms of knowledge are being questioned. It also serves a purpose of reflection on the limit ad the potential of citizen science, disseminating the lessons from the living lab into other contexts. In addition to this network, a constant effort of advocacy, reach out, and best practices sharing was done vis-à-vis many Brussels based stakeholders. Also (but not only) because of the AirCasting project, more and more projects are taking a citizen science approach to measure air pollution. These include projects led by the civil society (LuchtPijp, Greenpeace, Bruxselair...), but also by local governments and the administration.

As a complement to the efforts to scale up the “cognitive” component of the living lab, we also strived to scale up its “operational” component, going from knowledge to action. During the first year of the Brussels Living Lab, we made different attempts to engage with regional governmental institutions responsible for mobility, environment and smart city. These included meetings with staff of the cabinet’s and of the administration, and official letters with different proposals for cooperation and joint activities within the Living Lab. The institutions did not answer to any of the proposals, for reasons that we could only speculate on. On this basis, it was decided to approach institutions through a different channel: via the political production of the Brussels movement for cleaner air. Rather than approaching directly the regional institutions, BRAL and Cosmopolis contributed to facilitate a dialogue between citizen groups and political parties in the context of the local and regional elections, thereby scaling up the Living Lab via the consolidated practices of democratic representation. This was done, for instance, through, a process of citizen lobby in view of the regional election (series of facilitated dialogues between citizens groups and parties’ representatives).

Conclusion

The Brussels case of Smarter Labs was designed with the objective of producing a detailed map of air pollution in Brussels on the basis of citizen science and participatory measurements. In addition, these measurements and mappings were intended to develop a learning process to empower citizens (in particular those usually excluded from the realms of policy and scientific knowledge) and to generate insights into the interaction between citizens and public authorities and the barriers to large-scale change of the socio-technical system of urban mobility.

In a little less than three years, the Living Lab, together with a series of other similar projects have triggered a broad civic mobilisation around the claim for better air. At the time we write, the project participants and other stakeholders are about to organise the Etats Generaux de l’Air de Bruxelles taking place on 25-27 April 2019. Combining an international research symposium, a hackathon and different citizens & civil society activities the initiative will bring together the different actors striving for a cleaner air in Brussels, provide a platform for dialogue and collaboration, and discuss visions and solutions to realise a healthier city. By bringing together all sorts of knowledge about air pollution in Brussels, by developing coalitions and participatory visioning for the city, and by contributing to democratise science and urban governance, the event-and what will hopefully come next- can be considered a tangible output of the achievements of the Smarter Lab project.