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City of Leuven: Intelligent City Transformation Overview

ICC Final Deliverable – final version

Executive summary

Leuven scores very well on managing and respecting the natural environment. The city's economic growth and strategic focus on skills is paying off (low unemployment rate, above-average GDP growth, support to start-ups and scale-ups are...). Also, in the area of health and safety the city of Leuven (as the rest of the Flemish region) performs well, e.g., there is wide access to health-care services, the city has a response strategy in case of a pandemic, the city is very safe and sufficiently prepared in case of natural/climate disaster. Although city services are predominantly digitalized and free wireless internet available in confined public spaces, there is still room for improvement, e.g., a smart city data platform is launched but mainly internally but there is no open data platform yet. In the area of greening the economy, there are still actions to be taken: the 3R-principle is implemented only in some sectors, circular economy is mainstreamed in a very limited number of policy levers, and the local production of renewable energy is significantly below the national target for 2020.

With "Ground-breaking Leuven", the city's strategy is to become one of the most caring, green and sustainable, prosperous cities - through dialogue, cooperation and participation and by being innovative and willing to experiment. Its ambition statements focus on becoming a circular city that focuses on urban adaptation within a green city with a strong digital strategy and smart City approach, stimulating a sustainable consumption, and being a breeding ground for talent that supports companies.

In the framework of the ICC program the city of Leuven decided to select 3 projects/initiatives that were already planned or ongoing, aligning the ICC activities as much as possible with the functioning of - and within – the city ecosystem, and hoping to learn from other ICC cities engaged in similar projects, find alliances to start joint initiatives... Leuven's 'smart city data platform' has just recently launched but the ingestion of climate adaptive data, the 'resource HUB', and the 'circular economy needs assessment' are still ongoing and far from being fully implemented, but the city could learn, though rather fragmentarily, from several initiatives and expert input offered by ICC.

The city will continue to roll out and implement its projects, in addition to committing to participation in European projects, such as the European mission '100 Climate-neutral and smart cities by 2030' to pursue the ambitious goals to slash emissions rapidly and pioneer innovative approaches with citizens and stakeholders.

Mayor Foreword

"The city of Leuven is eager to participate in European projects like ICC, to learn from other cities in the context of European networks. It was exciting for Leuven to be able to present some of its own initiatives and visions at ICC related events such as the City labs, the New European Bauhaus.

The input of expertise in the context of the ICC project was much appreciated and will be further built on afterwards. In the meantime, Leuven was also selected as one of the 100 EU cities to join the European mission '100 Climate-neutral and smart cities by 2030' to pursue the ambitious goals to slash emissions rapidly and pioneer innovative approaches with citizens and stakeholders – a challenge the city is looking forward to taking on."

Mohamed Ridouani
Mayor of the city of Leuven

The city of Leuven pursued an EU-supported transformation over four main stages, and this document details that journey by these sections

Overview to the city's journey and structure of this document

Reported as one section

1 Preparation & assessment

5 months:
September 2020 – January 2021

2 Ambition & roadmap

3 months:
February 2021 – April 2021

3 Implementation

15 months
May 2021 – July 2022

4 Review & way forward

2 months
August 2022 – September 2022

Summary

The ICC city core team assessed the city strengths and weaknesses, in light of the selected projects, as well as a screening of the ecosystem to see who was best placed to join the core team in more actively participating in the ICC journey

The city of Leuven's strategy for ICC was put forward, in line with the overall city strategy, and as a framework for setting out and/or aligning implementation roadmaps for the selected solutions. The ecosystem was consulted and involved in order to contribute to the next steps

The implementation of the projects continued as foreseen – the projects will not be fully implemented at the end of the current ICC project, but the city teams continue to work towards implementation the next months/years

The city of Leuven will continue to roll out and implement its projects, in addition to committing to participation in European projects, such as the European mission '100 Climate-neutral and smart cities by 2030'

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Section

1

City of Leuven: Preparation and assessment

ICC transformation

September 2020 to January 2021

Introduction (1)

Leuven is a **mid-sized city** of roughly 100.000 inhabitants and 50.000 students located in the heart of Belgium. It is renowned for its university **KU Leuven** and is home to **AB InBev**, one of the largest fast-moving consumer goods companies in the world. Leuven also plays host to major research centers such as **imec** (Europe's largest independent nanoelectronics research center), **VIB** (biotechnology), and **Flanders Make** (manufacturing).

Among Leuven's assets are not only its strong research institutions, but also its outstanding track record in **health, high-tech, and creativity**. The city is also fertile ground for entrepreneurs: close to 8.000 SMEs call Leuven home. Tying it all together is Leuven's unique governance model, built on **collaboration** and mission-oriented innovation.

Introduction (2)

Through the triple helix network **Leuven MindGate**, with more than 300 member organisations, the city harnesses its talent and resources to ensuring a thriving economy.

Via the quadruple helix network **Leuven 2030** the Leuven ecosystem is tackling climate change and achieving a resilient, net-zero-carbon city.

In 2017 Leuven was awarded the **European Green Leaf Award**; in 2018, it was a finalist for the European Capital of Innovation Award and in 2020 it won the **iCapital Award** for its radical embrace of the power of collaboration. In 2022 Leuven was also selected as one of the 100 EU cities to join the European mission '**100 Climate-neutral and smart cities by 2030**' to pursue the ambitious goals to slash emissions rapidly and pioneer innovative approaches with citizens and stakeholders. Another great recognition for Leuven's model of collaboration and the efforts on climate and innovation. Leuven is seen as an innovation lab, a city that can serve as an example for other European cities. This reinforces the city's ambition to make Leuven one of the most sustainable, progressive and prosperous cities in Europe, with and for everyone.

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City needs: State of the city overview

The state of Leuven today

Green economy: Leuven has taken already significant steps in waste management and is boosting circular economy. On other points, there is still work to do: the 3R-principle is implemented in *some* sectors, CE is mainstreamed in a very *limited* number of policy levers, the local production of renewable energy is significantly *below* the national target for 2020.

Natural environment: Leuven scores very well on food systems, integration of natural resources, air quality, water sanitation. The effectiveness of water supply systems management can be improved.

Government services and social connectivity: Services predominantly digitalized, e-government possible via fully digitalized platforms, most of the city covered by 3G/4G networks, free wireless internet available in confined public spaces, a smart city data platform is launched, PPI in a few cases, public participation is widespread and growing.

Economic growth and skills: The city has a strategy on upskilling/reskilling, there are sufficient trainings provided by different organizations, unemployment rate is lower than the regional average, GDP growth is above the average regional growth, there is support for start-ups and scale-ups, there are plenty innovation labs, accelerators, incubators, ...

Health and safety: Most of the population has access to health-care services, there is a response strategy and the resources for implementation in case of a pandemic, the city is very safe, road traffic accidents are very infrequent, the city has implemented a climate change risk assessment, vulnerability mapping has been done and the city is taking action to increase adaptive capacity where necessary, the city is sufficiently prepared and has enough resources in case of natural/climate disaster.

Key insights from city performance analysis

Higher performance observed

1 Natural environment

2 Economic growth and skills

3 Health and safety

Lower performance observed

1 Green economy

2 Government services and social connectivity

City ecosystem

A summary of findings from the stakeholder engagement workshop, local ecosystem enablers and 1:1 interviews and in particular:

Shared aspirations and vision – All stakeholders see the city in the same light and believe we are already on a journey: Within Leuven 2030 and Leuven MindGate, we have a significant group of stakeholders (government, knowledge institutions and companies) that are working together to make our city a smart, sustainable, green and economically strong city. Leuven 2030's shared vision is reflected in its Roadmap 2025-2035-2050, a co-created document endorsed by 15 key stakeholders that details the path towards a climate-neutral, resilient city.

What we bring and how we work together – Different parties are bringing capabilities to the party. We work together well in ecosystem situations:

Leuven MindGate has a network of more than 300 stakeholders in the field of health, high-tech and creativity, who can be and are involved in various projects. Leuven MindGate works closely together with the city of Leuven and Leuven 2030. Leuven 2030's network includes over 550 members and contains knowledge/capabilities on key 'vertical' areas such as energy, mobility, and adaptation, as well on cross-cutting areas such as governance, data and monitoring, and stakeholder engagement.

Urban resources for transformation – Our wider city more broadly has the typical assets needed for a major transformation like access to capital, a skilled labor force and critical thinking:

Leuven has the necessary assets: highly educated knowledge workers, a strong record of R&D and innovation, the most innovative university of Europe, world-leading research institutes and companies, a strong record of collaboration…

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ICC strategy: Vision and ambition statements

"Ground-breaking Leuven":

Leuven becomes one of the most caring, green and sustainable, prosperous cities - through dialogue, cooperation and participation and by being innovative and willing to experiment.

Ambition Statement 1.

Leuven is a sustainable, resilient, and circular city that focuses on urban adaptation within a green city.

Leuven is an innovative and efficient city with a strong digital strategy and smart City approach

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Ambition Statement 2.

Leuven is a sustainable, resilient, and circular city that promotes the stimulation of sustainable consumption and circular economy.

Ambition Statement 3.

Leuven is a prosperous city and a breeding ground for talent that supports companies.

A **smart city data platform** enabling the city to (1) **fully exploit** (historical and real time (city)) **data for governmental policy**, and to (2) make these data available to its citizens as open data

Building a (physical) 'Resource HUB' where:

- Specific **residual waste streams/flows will be re-used**

- **Additional jobs** will be created (resulting from the new entrepreneurship that will be stimulated by the Resource HUB

Creating **a cooperative collaboration model** in which **service providers from the ecosystem work together to support the sustainability transition** at companies.

City strategy - justification (1): Guiding thoughts & interaction between the 3 solutions

Boiling down the strategy to three thoughts that have best guided the city on its way:

Climate change and the way we handle our planet will affect all of us. It is time to make the necessary changes.

We need to apply **more 'circularity'** to everything we do. We can guide and lead with clear example and help those that also want to make a change.

In the advent of the **'age of data'** we need to use data more efficiently, for our own policymaking as well as for acceptance and communication with our inhabitants.

1 *Data (open, visualization, BI) for climate adaptive measures for policymakers and general population*

Solution 1 focuses on climate-adaptive measures but the expertise on the use of data for policymaking and the broader public can surely be re-used for **solution 2**

2 *City Resource Hub aimed at valorizing residual waste*

Solutions 2 and 3 interact with each other. Both focusing on circularity. They can reinforce each other.

3 *Bringing stakeholders together with focus on sustainable, green, circular economy and business models*

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City strategy - justification (2): List of dimensions for potential cross-city collaboration

Area/topic of interest for collaboration or exchange	Description	Partner city/cities	Benefit for the city of Leuven	Benefit for other cities
Circular residual waste	Project 'City Resource Hub'	Amsterdam/Leuven *(Utrecht/Rotterdam)*	Learning how they are implementing the City Resource Hub (De Clique)	Knowledge exchange
Circular economy	Project 'Circular business models'	Best practices in EU	Being able to help our companies and SME's to become more futureproof	
Climate adaptation	Project 'Data platform'	Amsterdam Antwerp	Approach on organisational level Technical feasability	
3helix ecosystem on innovation	Mentor city Greater Phoenix Connective's collaboration model	Phoenix	A possible, new level for ecosystem organisation Leuven MindGate	Knowledge and approach sharing between universities, governments and businesses

In the framework of ICC the city of Leuven identified some interesting areas for collaboration or exchange with other core and mentor cities

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Section

2

Leuven: Ambition and roadmap

ICC Transformation

February 2021 to May 2021

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

Rationale to the roadmaps

For the ICC project the **City of Leuven selected 3 projects/initiatives that were already planned or ongoing**. In the context of ICC, the city mainly hoped to learn from its participation in the ICC program: getting in touch with cities engaged in similar projects, learning about additional financing channels, finding alliances to start joint initiatives... The city wanted to **align the ICC activities as much as possible with the functioning of - and within - its own ecosystem**. The ecosystem of the city of Leuven is already very mature and well-organised - one of Leuven's focal points is setting up (successfully) inspiring governance models in which residents, companies, organisations and knowledge institutions are committed to help shape the future, and eventually become a smart(er) city in all possible meanings.

Leuven's 3 ICC projects all fit within Leuven's strategy and vision, but they are not strictly linked to one another. As the 3 solutions are very diverse, have their own scope and status of implementation, **they all have their own roadmap**, indicating the scheduled timeline and milestones. Not all 3 projects will be fully implemented yet by the end of the current ICC program.

In the next slides for each of the 3 solutions the initiative charter, roadmap and governance structure is showcased.

Some preliminary considerations regarding the roadmaps and governance structures for the proposed solutions

- Solution 1 'Data platform': the funding, timing and governance structure were already set when this multi-city project started prior to the ICC project

- Solution 2 'City Resource HUB': to date this project still has not secured funding for implementation yet. It did not work out to fund the project through Interreg (the proposal submitted in 2021 was not approved). No governance structure is set yet.

- Solution 3' Exploring Local companies' needs to transition to circular economy': this rather small-scale initiative was initiated and further shaped in the ICC project. The roadmap is quite straightforward and simple, as it is not entirely clear yet what the next steps will be, building on the interim output, and who will be involved.

Initiative charter for SOLUTION 1:
Using data analysis for policy support in climate-adaptive measures
Using open data and data visualization in climate adaptive measures to increase support and drive change in our general population

Strategy

Description

(1) Creation of data platform: Using data and data analysis in climate adaptive projects, e.g., drought plans, flood plans and heat plans... to better understand and evaluate solutions, (2) Visualizing this data to the general population, (3) Opening the data for interoperable use by the ecosystem https://www.brugge.be/smartcity/dataplatformbruggeleuvenroeselare . The involved cities hope the project initiates a standard data platform for other Flemish cities and municipalities.

Link to vision

This project will help Leuven to become one of the most caring, green and sustainable, prosperous cities - through dialogue, cooperation and participation and by being innovative and willing to experiment.

Link to ambition statement

Urban climate adaptation within a green city.

Strong digital strategy and Smart City approach.

Expected impact and timing

Expected impact: a data platform that will enable data-driven policy making based on objective data, and as an important data source for possible digital twins in the future – other Flemish cities are invited to participate in the framework agreement which will increase both the cost-effectiveness and application area of this data platform

The project should begin to create impact as from February 2022 - i.e., as from when the Smart City Data Platform will be operational

Stakeholders involved

Solution lead:

The city of Leuven (in a consortium with 2 other Flemish cities: Bruges and Roeselare – the 3 cities focus on another dataset in first instance)

Solution working team:

The Smart Cities team (of each of the 3 initiating cities: Leuven, Brugges, Roeselare

Contributors:

City of Leuven, Leuven 2030, Leuven MindGate (high-tech and data analytics companies), KU Leuven (university)

Risks and mitigation

Expensive and innovative project: (1) Paying attention not to go too fast: is the market ready? (horizontal urban data platform (city) vs vertical solutions (data silos), (2) Cost-heavy sensor networks with relatively low ROI, (3) Having the right IT infrastructure within the city?, (4) Opening and sharing the data vs proprietary data

The mitigating measures that are being put in place: the start of the project is already funded, the city of Leuven is not alone in the project, the cities commit their smart cities expert teams to the project

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The source of funding and an estimate of the cost:

The project's estimated cost is EUR 50 000 investment fee and EUR 40 000 annual service fee for Leuven's part of the project. For the start of this project Leuven received a grant from Flanders.

Extra (EU) Funding needed for the "next steps" (for adding additional data sets) and learning from other cities that have/are creating similar data platforms

Solution maturity outputs

The Smart City Data Platform will enable the city to fully exploit lots of historical and real-time (city) data for governmental policy as well as to make these data available to the citizens as open data

City performance outcomes and impacts

The envisaged better policy making by using the data platform is ultimately at the service of city residents

High level implementation roadmap for SOLUTION 1 ("10000m plan")

SOLUTION 1: Using data analysis for policy support in climate-adaptive measures

... → Post-ICC

		Month 2/ Q4 2020	Month 6	Month 12	Month 18	Month 24/ Q4 2022

1. Initiative #1: tendering

1. Data platform: setting-up & testing

2. Implementation MIMs

3. Onboarding in platform: 3 data sets from the 3 cities

4. Data platform in production — DATA PLATFORM ★

5. Visualisation

6. Sharing

As soon as additional data streams can be included in the data platform

2. Next steps

EXTRA FUNDING

ADDITIONAL DATA SETS ★

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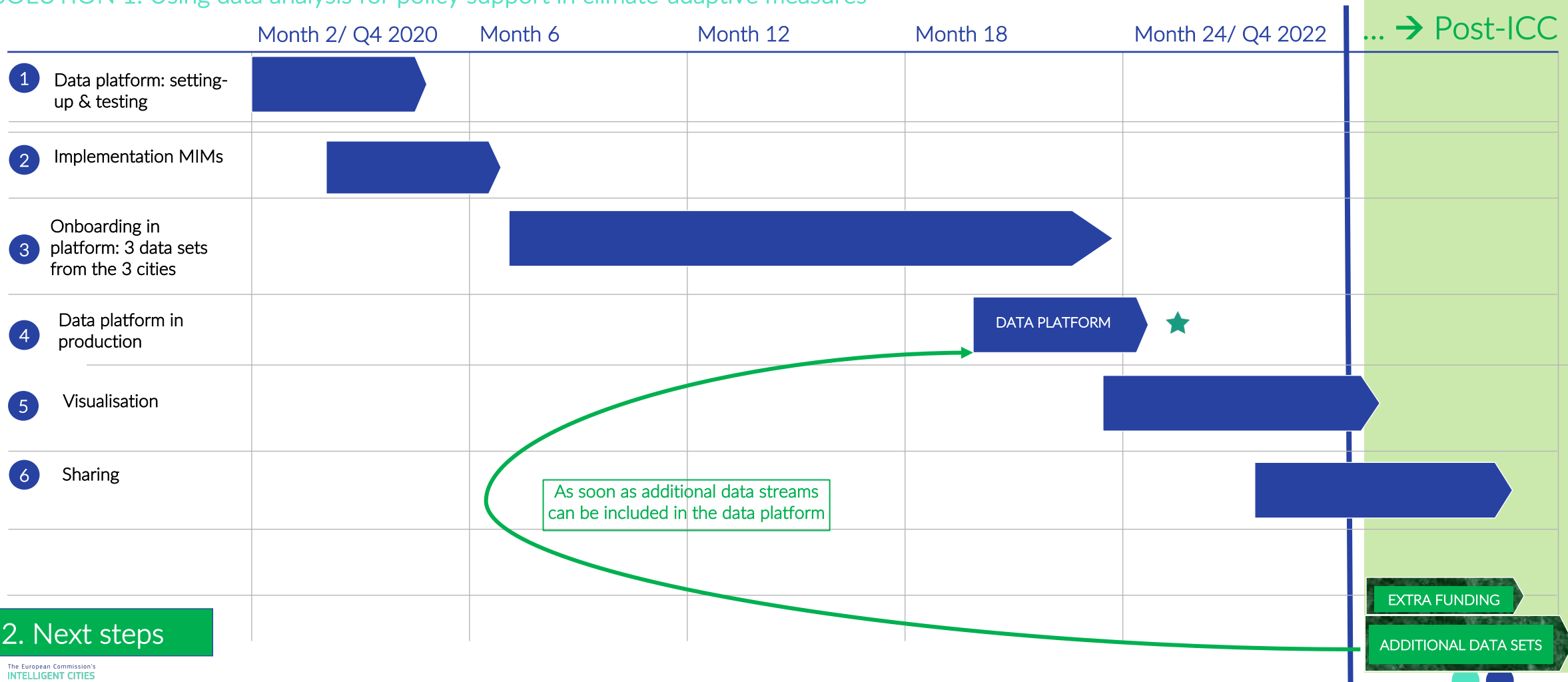
Governance structure for roadmap implementation
Solution 1: Using data analysis for policy support in climate-adaptive measures

Steering Committee
- ICT heads of departments of the 3 cities + local politicians

Reviews overall progress, takes key decisions and sponsors overall roadmap

PMO
- Steering group of 3 cities and dedicated account in Urban Sense (consortium Cegeka, Sirus, KPN)

Provides administrative support for overall project implementation

Core team
- Smart City policy advisors of the 3 cities + + ICT heads of department

Initiative 1
- Data set Noise pollution

Initiative 2
- Data set Crowdmeasurement

Initiative 3
- Data set Water

Initiative 4 (to be ingested)
- Data set Heat

Initiative charter for Solution 2:
Resource HUB

Strategy	
Description	Set-up a Resource HUB, by (1) Setting up partnership, (2) securing funding (through both contribution from founding members and grant funding), (3) identifying potential waste streams and associated business opportunities, (4) identifying potential locations …
Link to vision	This project will help Leuven to become one of the most caring, green and sustainable, prosperous cities - through dialogue, cooperation and participation and by being innovative and willing to experiment.
Link to ambition statement	Leuven is a sustainable, resilient, and circular city that promotes the stimulation of sustainable consumption and circular economy.
Expected impact and timing	Expected impact: reducing waste, and creating & stimulating new entrepreneurship

As the initial Interreg VL-NL proposal was not withheld, the proposal will be revised in order to be submitted in another call. Timing tbc. |

Stakeholders involved	
Solution lead:	Leuven 2030
Solution working team:	See below - contributors
Contributors:	City of Leuven, Leuven 2030, UCLL, Werecircle, SAAMO, ILVO, Greenaumatic
Risks and mitigation	Securing sufficient funding for further project development and project implementation.

Aligning different business models.

No specific mitigating measures are taken or planned (yet) |

Inputs, outputs, outcomes and impacts	
Source of funding and estimated cost	1.5 to 3 million € (depending on the "physical content" of the resource hubs)

For the implementation there is guidance and support on different aspects, e.g. legal questions, business planning and positioning, spatial embedding and location. An Interreg project to implement the resource HUB was also submitted in Q4 of 2021, but not granted - new funding options are being explored |
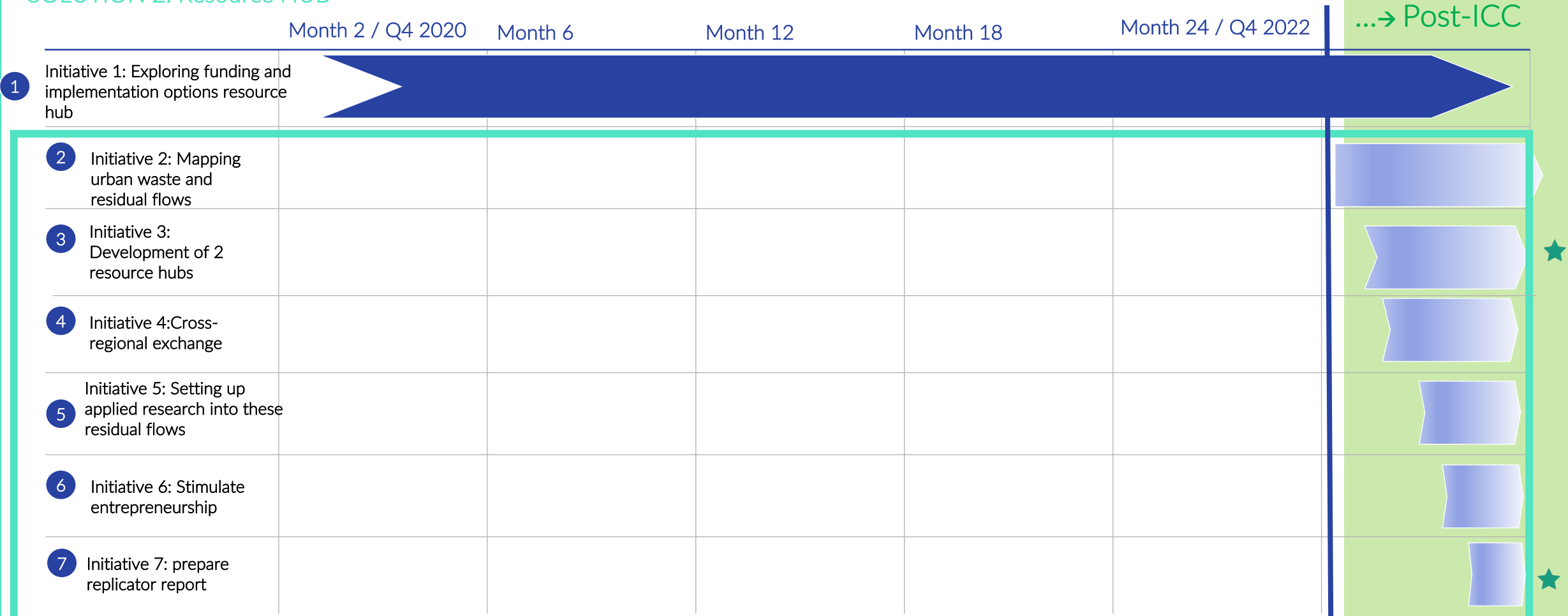| Solution maturity outputs | Not relevant yet |
| City performance outcomes and impacts | The project should result in re-using specific residual flows – the possibility of additional jobs being created (resulting from the new entrepreneurship) is real |

High level implementation roadmap for SOLUTION 2 ("10000m plan")

SOLUTION 2: Resource HUB

	Month 2 / Q4 2020	Month 6	Month 12	Month 18	Month 24 / Q4 2022	...→ Post-ICC
1 Initiative 1: Exploring funding and implementation options resource hub						
2 Initiative 2: Mapping urban waste and residual flows						
3 Initiative 3: Development of 2 resource hubs						
4 Initiative 4:Cross-regional exchange						
5 Initiative 5: Setting up applied research into these residual flows						
6 Initiative 6: Stimulate entrepreneurship						
7 Initiative 7: prepare replicator report						

"scope of a funding project' (TBD)

Initiative charter for Solution 3:
Exploring Local companies' needs to transition to circular economy

Strategy

Description

(1) Mapping the needs of the local companies in the field of sustainable, circular entrepreneurship – and linking this to some ongoing projects re circular economy – in order to help companies to make the real transition to circularity, by listening to the needs in that perspective of companies in the different circular and sustainable projects of the city. And (2) Exploring the options to create a self-sufficient circular economy HUB

Link to vision

This project will help Leuven to become one of the most caring, green and sustainable, prosperous cities - through dialogue, cooperation and participation and by being innovative and willing to experiment.

Link to ambition statement

Leuven is a prosperous city and a breeding ground for talent that supports companies.

Expected impact and timing

Expected impact:

The expected impact could be that there is a starting point, a basis, to better understand what local companies need to make the CE transition for real., and to have a better idea of what the business model options are for creating a self-sufficient local HUB for supporting local companies in their transition towards becoming more circular.

Stakeholders involved

Solution lead:
Leuven MindGate & Leuven 2030, City of Leuven

Solution working team:
Leuven MindGate, Leuven 2030, Rikolto, city of Leuven

Contributors:
City of Leuven, Leuven 2030, Leuven MindGate, Local companies (members of Leuven MindGate)

Risks and mitigation

It can be difficult to reach and convince companies to participate in these kinds of activities.

At this stage, no mitigating measures are considered – it is too early to focus on this in a targeted manner>

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The involved partners in the Leuven eco-system working on circular economy all have some resources (in terms of man days) available for exploring these research questions. From the ICC project a qualified thematic expert was made available for some supporting tasks.

Solution maturity outputs

At this stage, this small-scale project does not focus on (using) new technological solutions (e.g., increase in broadband coverage, establishment of open data platform and datasets, etc.).

City performance outcomes and impacts

How well the outcome of this exploratory initiative will help perform the city in terms on concrete outcomes and impacts (e.g., quality of life, air quality, increase of number of jobs, etc.) is difficult to mention at this stage

High level implementation roadmap for SOLUTION 3 ("10000m plan")
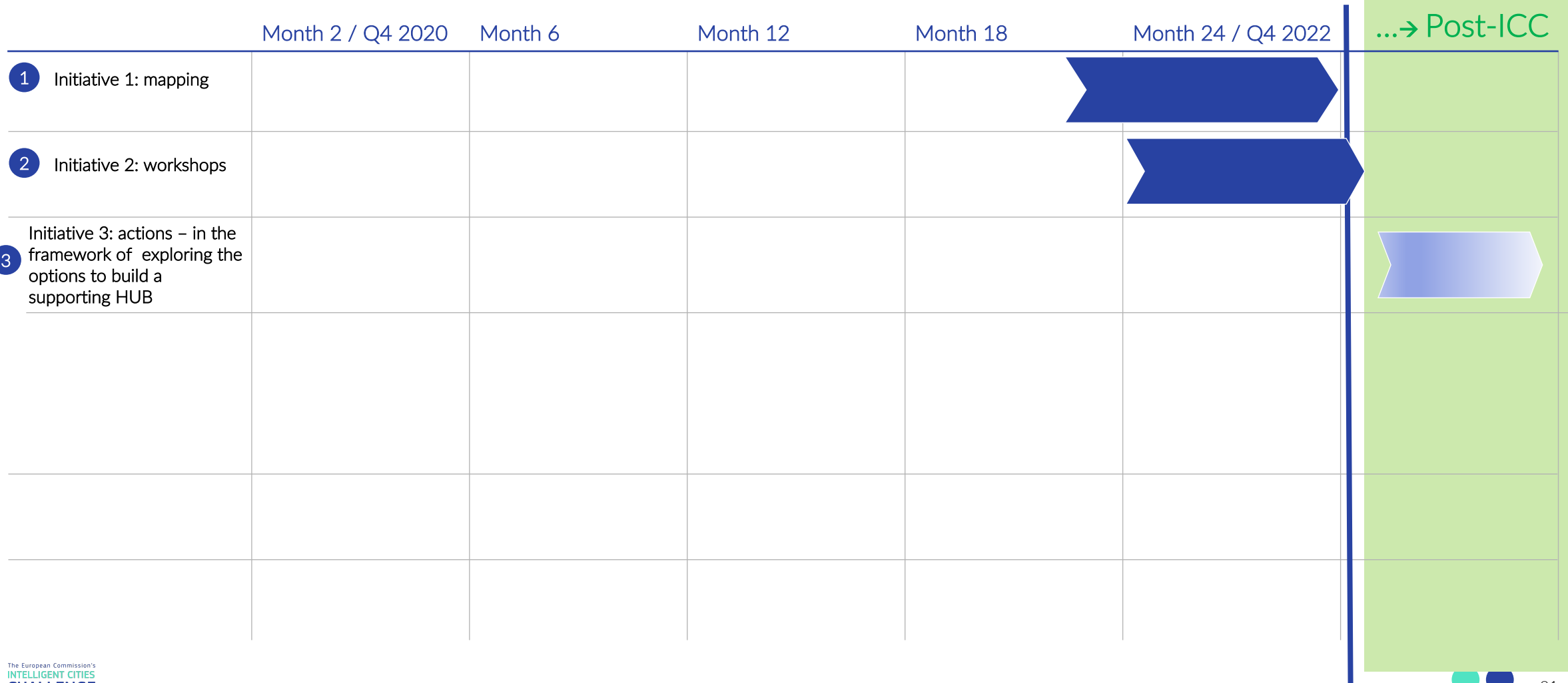**NOTE: No specific timing is specified (yet), and a complex roadmap might not even be required (as this 'project' is rather a small(er)-scale exploration into the topic**

SOLUTION 3: Exploring Local companies' needs to transition to circular economy

	Month 2 / Q4 2020	Month 6	Month 12	Month 18	Month 24 / Q4 2022	...→ Post-ICC
1 Initiative 1: mapping						
2 Initiative 2: workshops						
3 Initiative 3: actions – in the framework of exploring the options to build a supporting HUB						

Joint management of the project, (coordinated by Leuven MindGate)

Leuven Mindgate coordinates the research question on CE needs and the options for a CE HUB (business model), in close coopration with the other entities within the Leuven ecosystem involved in the topic of CE

Leuven Circulair

Leuven MindGate

Leuven 2030

Combined expert support in the field of circular economy
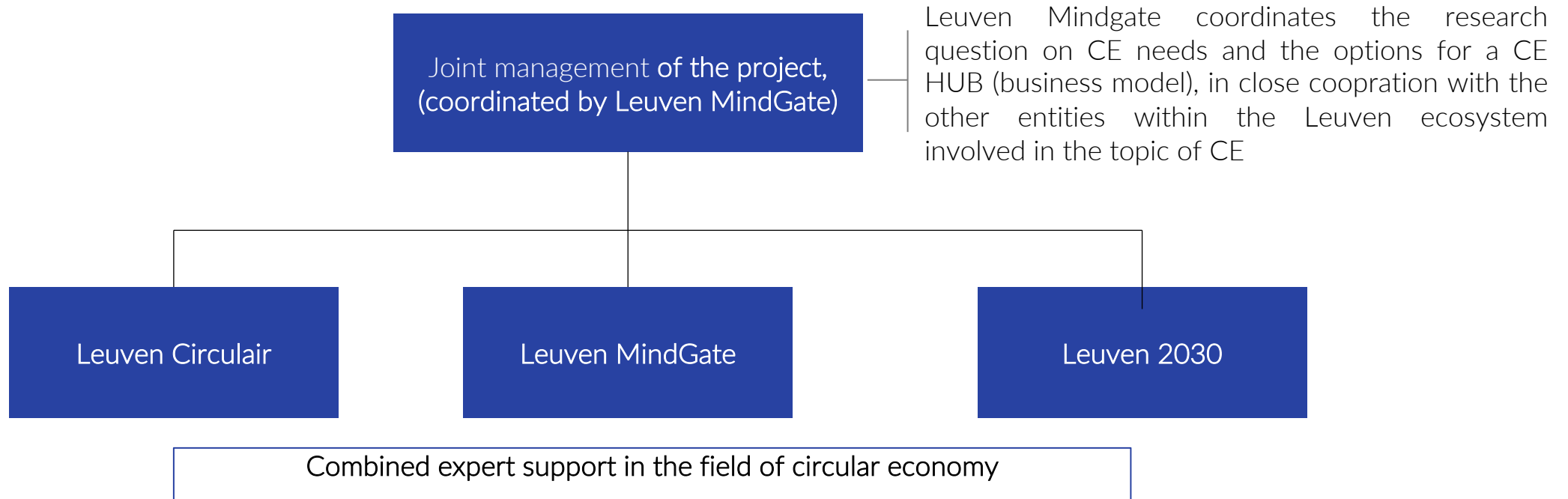
Key Performance indicators - overview

Describing the intended outcome and impacts for the 3 solutions was obvious; the city of Leuven has (had) a good idea (in advance) about the intended outcome of the solutions. On the other hand, it is, at this stage, not possible (yet) to set KPIs and measure the outcome and impacts of the initiatives – as the solutions are not (fully) implemented yet.

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
1. Data platform	Collaboration with 2 other Flemish cities, to set up a shared data platform – each focusing (in first instance) on 1 data flow but created to widen in participating cities and dataflows	Creation of a dataplatform – for all 3 involved cities. The Smart City Data Platform will enable the city to fully exploit lots of historical and real-time (city) data for governmental policy as well as to make these data available to the citizens as open data	*The envisaged better policy making by using the data platform is ultimately at the service of city residents
2. Resource HUB	Setting up collaboration for an Interreg Funding projects, for working towards building a resource HUB – a project that was not granted, so new options for funding are being explored	Creation of a Resource HUB More entrepreneurship	*Re-using specific residual flows *The possibility of additional jobs being created (resulting from the new entrepreneurship) is real
3. Mapping needs & supporting options for circular economy	Working together with the Leuven ecosystem that focuses on circular economy, to explore the options to support local business in this field	A support mechanism for local businesses to transition towards more circularity (e.g., a self-sufficient HUB?)	More local businesses actually working towards more circularity

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Section

3+4

City of Leuven: Impact

ICC Transformation

February 2021 to May 2021

Impact executive summary

For the ICC project the City of Leuven selected 3 projects/initiatives that were already planned or ongoing - hoping to learn from other cities engaged in similar projects, learning about additional financing channels, finding alliances to start joint initiatives...

Describing the intended outcome and impacts for the 3 solutions was obvious; the city of Leuven has (had) a good idea (in advance) about the intended outcome of the solutions. But it is, at this stage, not possible (yet) to set KPIs and measure the outcome and impacts of the initiatives – as the solutions are not (fully) implemented yet - the 3 projects have not yet been implemented far enough to make statements about the observable impact or to measure that impact. As the 3 projects/solutions have been thoughtfully initiated from - and fit within - the broader urban policy and visions of what the city of Leuven should focus on and how the city should evolve in the future, the risk that the intended impact will not materialize is nil.

The city of Leuven had the opportunity in ICC to engage with some thematic experts that provided valuable work and insights for projects 2 and 3. For project 1 there were already previous contacts with OASC (Open and Agile Smart Cities) to ensure interoperability and usage of European data models. Various city departments were also given the opportunity to take the stage at various initiatives (city labs, New European Bauhaus) and present their approach and initiatives. On the other hand, the ICC process and methodology of achieving the focus on problems and solutions was in general perhaps not most suited for the city of Leuven. There is already quite some experience with ecosystems and stakeholder(management), so sometimes the process was a repeating of work that was already done. This was a bit contra productive, especially in the first year (vision, ambitions...). A one-size-fits-all approach did not seem the best approach here. The ICC core team managed to make things work by developing a more tailor-made approach based on the offered tools. The networking has to be beneficial for all participants – e.g. City Labs: more attention to, for instance, the matchmaking in the peer review process would have been better.

Assessment of city performance, solution maturity, and city ecosystem and activities - progress against KPIs

	Where we started	Midway through the challenge	Final results
City performance			
1 KPI 1 (solution 1 – data platform): better policy making by using the data platform	Data platform was purchased	3 data flows were integrated in the data platform (as foreseen)	Data platform is not fully implemented yet: the platform is 'live' but there is still no use case for climate change in it
2 KPI 2 (solution 2 – Resource HUB): Re-using specific residual flows	Interreg funding dossier was submitted	Interreg funding was not granted	New funding for the Resource HUB project is being explored
3 KPI 3 (solution 2 – Resource HUB) creating additional jobs (resulting from new entrepreneurship	(same as KPI 2)	(same as KPI 2)	(same as KPI 2)
4 KPI 4: (Solution 3 – CE) More local businesses actually working towards more circularity	'Circular Economy mapping (needs and business models for a 'HUB')' exercise was explored	Sessions with experts were organised	<No results (yet) are finalised – this exercise will go beyond the ICC project

Assessment of city performance and solution maturity - discussion

City performance

The 3 projects have not yet been implemented far enough to make statements about the observable impact or to measure that impact.

As the 3 projects/solutions have been thoughtfully initiated from - and fit within - the broader urban policy and visions of what the city of Leuven should focus on and how the city should evolve in the future, the risk that the intended impact will not materialize is nil.

It is too early at this stage to start assessing the intended impact of the solutions on the city performance.

Solution maturity

Projects 1 and 2 each have a timeline that was more or less fixed in advance, and each of which depends on the project-specific scope and design of the project. The timeline for the third project, which really started very late in the ICC trajectory, is very flexible and largely dependent on the available time that can be spent on it from the various entities involved in the urban ecosystem. In that sense, the timeline and maturity of the projects are separate from the ICC project. At the moment, the 3 projects are far from being finalized:

- Solution 1: the data platform has been purchased with a multi-city and multi-use case approach with a business model that is open to new cities and a variety of use cases. The first 3 dataflows and solutions have already been rolled out. For Leuven noise sensor data and public messaging via an app controls the public lighting in order to nudge for less noise pollution. Plans are on the way to ingest weather, heat and water sensor data in Leuven to make a predictive model.

- Solution 2: the Interreg project for funding the Resource HUB (submitted in 2021) has not been approved, and new funding options are being explored

- Solution 3: the project concerning the exploration of the needs and options to create a support hub for the circular economy only started in the spring of 2022.

The projects will continue over the next years.

Assessment of city ecosystem and activities - discussion

Leuven's ecosystem is mature and well organised. In the context of the ICC program and the proposed projects, the concerned entities and partners in the ecosystem were involved to cooperate and to think along for aligning current/planned projects as best as possible with the expectations from ICC – e.g., working sessions with (among others) thematic experts, drafting output documents/deliverables, participating in city labs and other European events to present Leuven's initiatives, etc.

Within the framework of ICC, work was done as much as possible within the existing organisational/governance structures of the ecosystem. That works/worked well – because of the short lines of communication, the clear agreements and commitments that could be made, everyone knows each other well...

5 key lessons

Lesson	Reflections
1	In general, the ICC process and methodology of achieving the focus on problems and solutions was perhaps not most suited for the city. There is already quite some experience with ecosystems and stakeholder(management), so sometimes the process was a repeating of work that was already done. This was a bit contra productive, especially in the first year (vision, ambitions...). A one-size-fits-all approach did not seem the best approach here. The ICC core team managed to make things work by developing a more tailor-made approach based on the offered tools.
2	Looking back, perhaps it would have been more interesting to try to shape a (or some) new (but very specific) solutions or initiatives in the framework of an ICC project, where the ICC expertise/network/support... could really make a difference - instead of proposing existing/planned projects where the expectations towards and from ICC are perhaps harder to meet
3	The networking has to be beneficial for all participants – e.g. City Labs: more attention to, for instance, the matchmaking in the peer review process would have been better. There were no good match, and that is a pity.
4	. The "knowledge sharing approach" could have added more value if it was more proactively oriented towards cities (building on the interests expressed by the cities so far, make reader digests...).
5	. Finding appropriate and sufficient funding is crucial for projects; even if suitable funding is identified, setting up projects remains a precarious exercise as it is difficult to estimate whether a funding project will be approved effectively.

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Reflections on city collaborations

Topic	collaborations
3helix ecosystem on innovation	The city of Leuven and its ecosystem started (and is still) exploring the options to exchange experiences with 'mentor city' the Greater Phoenix Connective on collaboration models / 3helix ecosystem on innovation

Commitments

Commitments to ongoing resources	Commitments to ongoing collaboration	Commitments to ongoing KPIs
Project 1 (Data platform) – the project will continue as planned, with the secured and foreseen resources and funding **Project 2 (Resource HUB)** - the search for new funding for project will continue **Project 3 (Mapping needs and exploring support HUB re circular economy)** – there is an intention to further work on this topic/project (explore the options to create a CE support HUB), after the current ICC program **The Greater Phoenix Connective** – if considered useful (after a first exchange) a further learning track could be an option at a later stage	**Project 1 (data platform)** – the existing collaboration between the 3 involved Flemish cities will continue as foreseen – future collaboration with other Flemish cities is desired and possible in the governance and business model. In the framework of the ICC project no collaborations with ICC cities were set up for this project. **Project 2 (Resource HUB)** - In the framework of the ICC project no collaborations with ICC cities were set up for this project. **Project 3 (Mapping needs and exploring support HUB re circular economy)** - In the framework of the ICC project no collaborations with ICC cities were set up for this project. The Greater Phoenix Connective - if considered useful (after a first exchange) a further learning track could be an option at a later stage	**Project 1 (data platform)** – continuation of commitment to on-going KPIs **Project 2 (Resource HUB)** - continuation of commitment to on-going KPIs **Project 3 (Mapping needs and exploring support HUB re circular economy)** - continuation of commitment to on-going KPIs

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3 Year plan - ambitions

Building on the ICC, what would will the city aim to achieve in 3 years time?	The city of Leuven will continue to roll out and implement its projects (Data platform, Resource HUB), in addition to committing to participation in European projects, such as Leuven's commitment to the European mission '100 Climate-neutral and smart cities by 2030' to pursue the ambitious goals to slash emissions rapidly and pioneer innovative approaches with citizens and stakeholders. All steps in the road to becoming a more caring, green and sustainable, and prosperous city.
What steps will you take over the next 3 years to achieve these goals?	Exploring ways to participate in new (European) innovation projects and initiatives that enable the city to implement its' strategies is in the DNA of the city, always with a strong focus on collaboration with -and involvement of- Leuven's broad ecosystem.

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Appendix

City of Leuven: Additional information

ICC Transformation

February 2021 to May 2021

City Needs: State of the city – detailed analysis

HIGHER performance areas: (1) Natural Environment

Key insight	Data points	Interpretation	So what?
In the area of natural environment, the city performs well across the board, from water and natural resources to air quality and sustainable food systems	42,7 % of the total surface of Leuven is green. This is the second highest percentage of all Flemish cities. The green surface has increased in the last years, as has the satisfaction rate of the population concerning green in their neighbourhood (80%) and in the city (75%). *Environment analysis of the City of Leuven, 2018* Declining car travel is contributing to improved air quality: following the adoption of the city's new traffic circulation plan in 2016, the number of cyclists in the city center rose by 44%, while the number of cars declined by 19%.	- The city is investing heavily in green and blue infrastructure, and has recently secured EU funding to accelerate its efforts - The city's shift to sustainable mobility is contributing to improved air quality - The city supports several citizen-science initiatives to map local air quality, which have raised awareness around the topic and have provided the city with an evidence base for setting policy - The city has partnered with the university to map the urban heat-island effect - The city has carried out a comprehensive mapping of the local food system, which will enable it to identify relevant levers and actions for transforming the food system	**Actionability:** The city is setting policy and mobilizing stakeholders to preserve and expand its natural environment **Significance:** Urban resilience ranks high on the city's list of priorities **Prioritisation:** Adaptation and urban resilience (green and blue infrastructure, combating the urban heat-island effect) are focus areas within Leuven's ICC strategy

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City Needs: State of the city – detailed analysis

HIGHER performance areas: (2) Economic growth & skills

Key insight	Data points	Interpretation	So what?
The city has a good strategy, embedded in a strong cooperation model, to support economic growth and growth of skills.	The Leuven economy has a yearly growth of more than 3%. ** Environment analysis of the City of Leuven, 2018* 73,5% of employees in Leuven work in medium or high technology sectors. This is the highest number of all cities in Flanders. ** 2019, provincie.incijfers.be*	- There are sufficient trainings provided by different organizations - unemployment rate is lower than the regional average - GDP growth is above the average regional growth - There are multiple organizations offering support for start-ups and scale-ups - There are plenty innovation labs, accelerators, incubators, … - Strong record of tech transfer, large number of spinoffs (KUL, imec, ..)	**Actionability**: The city can influence by continuing this path of collaboration and by continuing to provide the necessary tools to ensure economic growth **Significance**: Important for our city to harness this model of cooperation. **Prioritisation**: This is not a key area of performance for the ICC strategy to address.

City Needs: State of the city – detailed analysis

HIGHER performance areas: (3) Health & safety

Key insight	Data points	Interpretation	So what?
The city has a good strategy / model for health and safety.	Almost 75% of inhabitants of Leuven feel 'very healthy to healthy'. This is the highest rate of al the Flemish cities. ** City monitor Leuven, 2017* In 2017 only 4% of the inhabitants of Leuven feel unsafe in Leuven. The average in the other Flemish cities is 10%. This rate has also lowered from 7% in 2014. ** City monitor Leuven, 2017* Black carbon measurements have shown that black carbon particles have decreased 2,5x since the implementation of the mobility circulation plan in the city centre.	- Most of the population has access to health-care services - There is a response strategy and the resources for implementation in case of a pandemic (proven during Covid pandemic) - The city is very safe, road traffic accidents are very infrequent - The city has implemented a climate change risk assessment - Vulnerability mapping has been done and the city is taking action to increase adaptive capacity where necessary - The city is sufficiently prepared and has enough resources in case of natural/climate disaster.	**Actionability**: The city can influence by implementing the necessary changes to ensure the wellbeing and safety of its citizens. **Significance**: Important for our city to harness this strategy. **Prioritization**: This is not a key area of performance for the ICC strategy to address.

City Needs: State of the city – detailed analysis

Lower performance areas: (1) Green economy

Key insight	Data points	Interpretation	So what?
While the city has a strong track record on waste management and is increasingly acting in the area of circular economy, more could be done to boost the production of renewable energy.	The percentage of renewable energy in the total of energy consumption in Leuven is only 0,8%. * *Study VITO energy mapping 2014* The average household in Flanders produces 469 kg of household waste, compared to only 369 kg by households in Leuven. * *Environment analysis of the City of Leuven, 2018*	- The city is laying the groundwork for bolder action on the local production of renewable energy; the centerpiece of this effort is a comprehensive energy strategy, currently in the works - The largest potential for RE lies in solar energy; a local energy cooperative was recently founded to boost solar-energy production - Wind power is trickier in Leuven, mainly due to the city's proximity to Brussels Airport and associated regulations - To further decrease energy consumption, Leuven is taking bold action on residential and non-residential retrofit	**Actionability**: the city is taking action by setting bold, evidence-based policy to boost RE production, energy efficiency, and circular economy **Significance**: the city considers decarbonization and a clean economy a top priority **Prioritization**: circular economy is a focus area within Leuven's ICC strategy

City Needs: State of the city – detailed analysis

Lower performance areas: (2) Government services & social connectivity

Key insight	Data points	Interpretation	So what?
Government services are predominantly digitalized, but data-driven solutions need to be implemented more.	Citizens in Leuven feel less than average (compared to the Flemish cities) involved with political decision making and changes in the neighbourhood (39%). But public participation is growing rapidly, especially via the digital platform 'Leuven, maak het mee'. Satisfaction with public services is higher than in other Flemish cities but is decreasing (75% is satisfied). *Environment analysis of the City of Leuven, 2018* There is no city-wide data governance approach and no structural use of real time data, open data or of a city API for information sharing.	- e-government possible via fully digitalized platforms - Most of the city is covered by 3G/4G networks - Free wireless internet is available in confined public spaces - No real-time data and no API - PPI in a few cases - Public participation is widespread and growing.	**Actionability**: More solutions can be implemented. E.g., open data : which data is useful for the different stakeholders in the city? **Significance**: Improvement is necessary **Prioritization**: This is a key area of performance for the ICC strategy to address: using data analysis for policy support in climate-adaptive measures + using open data and data visualization in climate adaptive measures