The Urban Lab of Europe!

JOURNAL

PROJECT

Antwerp Circular South - engaging the community in an online and offline circular economy

Antwerp, Belgium

TOPIC

Circular economy

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# Last UIA Antwerp Circular South Journal: Circularity as a new framework for cities

See on UIA website

This last journal of the UIA Antwerp Circular South project accounts for the evolution of the project after UIA funding was stopped. It details the different activities and works which are now finalised. It also analyses the last months of the partnership and the work within the City administration, together with the role of community engagement and approaches to make the project sustainable in the long run.

## Executive Summary

The Antwerp Circular South project has now been officially finished since June 2021. After almost 3.5 years of UIA funding, it has managed to install PVs and BIPVs, smart meters, to collect data and analyse them via tailored data treatment business logic and a blockchain system. The local community was engaged via offline and online activities and took part in nudging experiments to test their energy consumption changes potential, with the support of an app. The local community also set up an energy cooperative which can benefit from the profits of the energy produced by PVs to invest in the neighbourhood. Last but not least, circuit, the Circular South Community Centre is now built and can foster sustainable and circular lifestyles, around the offer of the shop, of the businesses it hosts as well as the activities for the neighbourhood.

The last months of the project have shown the necessity for a project partnership to be strongly committed if it wants to be a success. At the same time, transversality within city administration remains a key challenge and needs to be further stimulated. Community will remain engaged with the involvement of the City, identification of new funding resources and renewed partnerships.

The project will not stop now that funding has been used: all the UIA outputs are concrete and visible and will be long lasting in this neighbourhood, paving the way towards circularity as a new framework for cities.

# 1. REACHING OUT THE LAST OBJECTIVES AND ACTIVITIES OF THE UIA PROJECT

The UIA Antwerp Circular South project closed in June 2021. The highlights of the last months of the project – and since - have been:

- The purchase and installation of the (BI)PVs;
- The further development of the energy cooperative;
- The last nudging campaigns; and,
- The opening of circuit.

Except for the storage batteries, all the aspects of the project were eventually implemented as presented in the table below and further in this section.

| Stream | Technical devices | Modalities | Interface | Activities |
|---|---|---|---|---|
| Electricity | PV<br>BIPV<br>Storage batteries<br>Smart plugs | Online Community<br>Engagement<br>Transition board | Dashboard | Creation of a cooperative |
| Heat | Smart sensors | Data treatment procedures | | Circular coin<br>Smart contract |
| Water | Smart meters | | | |
| Waste | Smart waste bins<br>A-card | User profiling<br>Business logic Nudges<br>Blockchain | | Waste challenges<br>Group purchase |
| Material | | Recruitment of Repair buddies and makers | A Circular Community Centre (CIRCUIT) | Leasing of tools and devices<br>Repairs cafes<br>Circular material workplace<br>Redesign service<br>Study visits |

Update on the Antwerp Circular South project © Marcelline Bonneau

## 1.1 Technical devices

The leadership for the installation of the PVs moved from the City of Antwerp to Ecopower. Eventually, after challenging public procurement and identification of locations to install them (see Journal 3), in the very last months of the project, PVs (Photovoltaics) and BIPVs (Building-integrated photovoltaics) were purchased and implemented in 4 locations, in Antwerp South and beyond, as presented in the table below.

| | **PVs** | **BIPVs** |
|---|---|---|
| **Antwerp south** | Installation of a newly built building: Building 17 (45kWp) | Heat plant (15kWp) |
| **Remainder of the city** | Hof ter Beke/Care home (60 kWp)<br><br>Groothandelsmarkt/wholesalemarket (500 kWp) | |

Such a diversity of (BI)PVs enabled experimenting differenttechnical and practical aspects. The first installation, on Building 17, tested the installation of PVs on newly built building.

PVs on Building 17 © Marcelline Bonneau

The installation of BIPVs on the heat plant in Antwerp South, could test tailored colours and prints – enabling better fit in the architecture of the building with optimal solar caption.

BIPVs on the heatplant, before and after © Ecopower

On the top of the Hof ter Beke/Care home, the limiting effects of partial shading because of west solar orientation were prevented with the installation of optimisers.

PVs on care home © Ecopower

**Major learnings for the installation of PVs and BIPVs**

It is crucial to include the planned installation of PVs and BIPVs in a building from the beginning of the design of the building:

- This enables the PVs to be installed in the most suitable place
- This ensures the developer's buy-in – and to be actually installed
- It is also the option for the developer to use it as a selling point – beyond its mere profit-oriented business

**Batteries** were eventually not installed during the project, because of the little time remaining to finalise the project and the need to prioritise the last activities. Also, no site/owner could be identified who would agree to host them. Another major reason was that the consumption in the buildings on which solar panels were installed left very little excess energy that could be stored. Simulations with participants' data and battery model were used as a replacement of real batteries. The simulator appeared to be very useful to model consumption and identify who would benefit to use storage or not make any difference.

**Major learnings for the installation of batteries**

The technology is still new and the need for actually storing extra energy can be quite limiting. New projects should envisage the added value of such batteries (especially if a simulator can also be used instead).

By the end of the project, and because of the repetitive lock downs and restrictive measures, 61 smart meters were installed. As the supplier of the meters stopped activities, they have not been used since 31 March 2022.

**Major learnings for the installation of smart meters**

The added value for using smart meters to monitor energy consumption has been proven in this project. Yet, the main question remains as to connecting the meters with the data managers/owners (in this case, after the contract). Ensuring transfer of data/suppliers should be key to enable continuation of such monitoring. This could be done by the installation of smart meters in all newly built flats.

## 1.2 Back-office modalities

The online **community engagement** of the project stopped in May 2021. However, one major success of this period has been the eventual set-up and benefit from the Transition Board. Indeed, the 4 experts were invited to the final event of the project on 4 December 2020. Also, they compiled their visions of the Transition in the project and have consolidated their views on podcasts available online.

**Major learnings on the Transition Board**
To benefit the most from the expertise and experience of Transition Board's experts, it would be crucial to set it up at the very beginning of the project and identify clear roles for each of them: to take a step back, but also nurture and improve the synergies and meaningfulness of the project's activities.

The content of the nudges is fully operational, together with **data treatment and** integration, business logic for energy and waste, endpoints for ACPaaS data, virtualisation, Customer Energy Management System, and blockchain.

**Major learnings on the support and maintenance of IT components**
The most important challenge for the IT work was related to GDPR: collecting data of individual households, while being able to ensure that they can be appropriately identified / anonymized depending on the situation, required more layers of IT components than anticipated. Indeed, GDPR was quite new when the project started. Pseudonymization was a solution but not easy to implement. This question will become increasingly important in the treatment of data in the near future:

- Need to start envisaging GDPR-related issues of the project, earlier. Solutions exists, but they are complex, and the legislation is not always clear;
- A specific budget should be dedicated to it; and,
- Differentiating between public-good, related projects and consent-based projects.

The **nudging experiments** were continued until May 2021:

- Sustainable living experiment (February - May 2021)
  - Repetition of tips and tricks from previous experiments, via the app only, over a longer period of time.
  - The 22 participants received a questionnaire at the beginning and at the end of the experiment to assess their behaviours (e.g. how do they dry clothes, bring their own bags to shops, thrift shop or new cloths shop, ...)
- Water experiment (May 2021)
  - Tips consolidated over 3 cards on water consumption: in shower, toilets, and washing machine.
  - Tips also shared via the app
  - Data from water-link over one-month consumption (used 2019, 2020, 2021)
  - The 17 participants could use the circules (reward) for the last time, if they were consuming 10% less than the year before.

The partners were disappointed about the results of the Sustainable Living experiment (no reduction in energy consumption), which they explained by the continuous Covid-19measures, and the increased time spent at home (the previous nudging experiments took place in May-June 2020, after the end of the first lock down, making the data difficult to compare). In particular, the decrease of energy consumption in March 2021, as compared to May 2020 was limited:

- 11% managed to decrease for all 4 weeks (vs 3%)
- 7% managed to decrease 3 out of 4 weeks (vs 17%)
- 7% managed to decrease 2 out of 4 weeks (vs 38%)
- 27% managed to decrease 1 out of 4 weeks (vs 21%)
- 48% did not manage to decrease a single week

Yet, it is worth noting that even though the sustainable living experiment did not succeed, the water experiment resulted in a 10% decrease of water usage. There have also been significant improvements in behaviours and participants have become more conscious about their energy & water usage.

**Major learnings on the nudging experiments**
As mentioned in the 2nd Zoom-In, the data used during the experiments can be used in a qualitative way and not for statistical analysis. Long period of times/cohorts would enable comparing data – and usage of nudges - across different lifetime experiences (e.g.; seasons, lockdowns, etc).

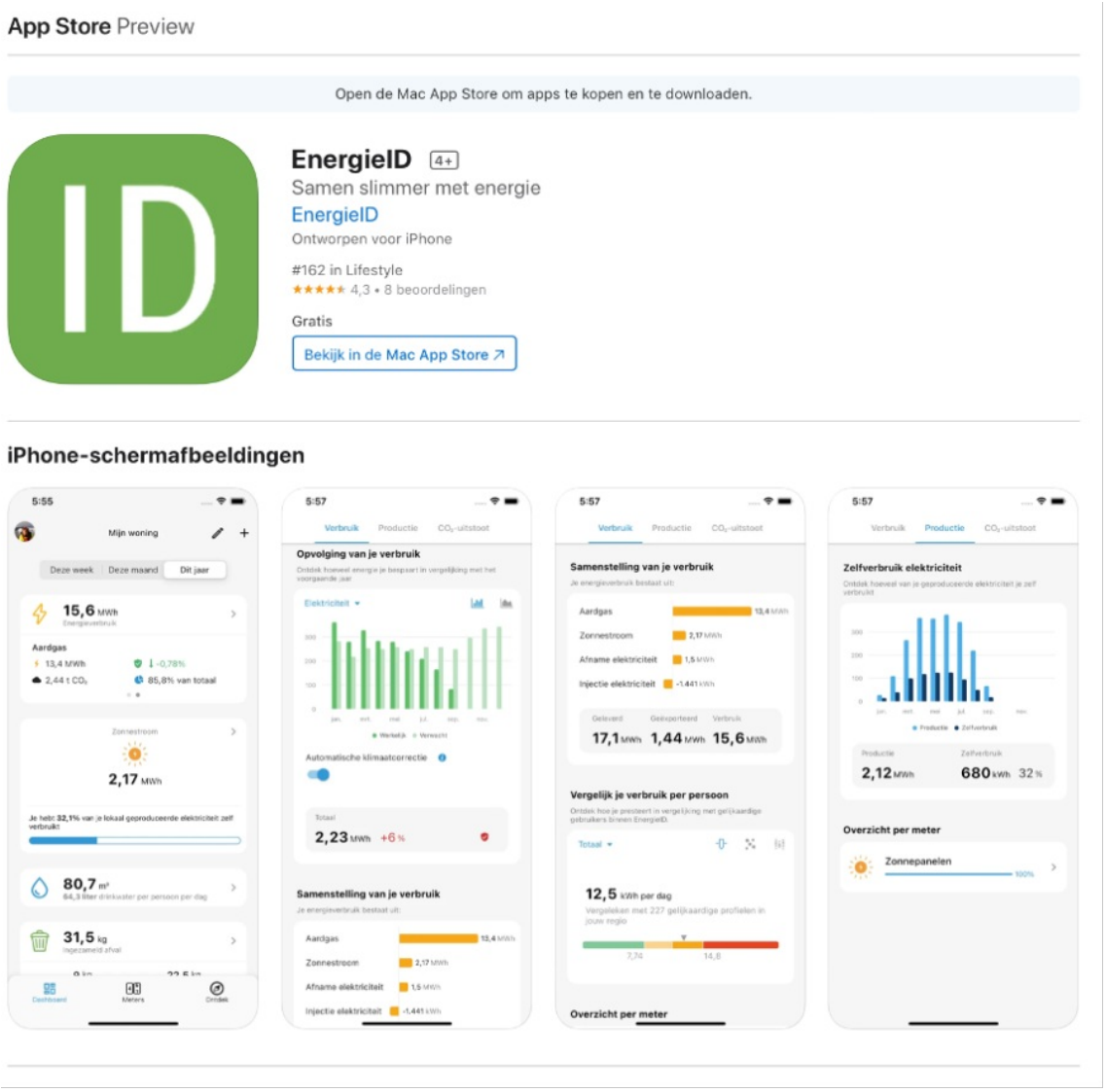
Water Nudging experiment cards © Circular South

## 1.3 Interface

The **application** is still working – used by 61 local residents - and available for use for a wider audience, beyond

Antwerp South, as part of a generic EnergieID-app that can be used by all EnergieID users across Europe, as well as for new projects. The development of the generic EnergieID app made sure that at least part of the results of the project could live on after the project. The application can be found here:

- Android: https://play.google.com/store/apps/details?id=eu.app.energyid
- Apple: https://apps.apple.com/be/app/energieid/id1542369914?l=nl




EnergieID app © EnergieID

**Major learnings on the app development**
The development of the app worked smoothly, with improvements for better functionality. The main challenge is to link it to the available data – depending on the agreement with energy providers and/or existence of smart meters. Further such collaborations should be developed in the future, to ensure the best possible use of such monitoring of data via a user-friendly app.

**circuit** opened on 19 June 2021. It is composed of a thrift shop, a multi-purpose room, an NGO - Rojo, a flower shop and coffee bar. The current revenues come from the sale of De Kringwinkel, the rent of offices/shops to small businesses and the activities of the neighbourhood – for which circuit receives a specific Flemish City Renewable Fund. Yet, the Business model of circuit is still very uncertain, especially in the light of the fact that the neighbourhood is still being built. There is an average of 60 paying consumers per day instead of 200 to make it viable. There is a constant turnover of businesses – which test their activity there, and for some, leave after a couple of months. De Kringwinkel anticipates that the next 5 years will be challenging. However, as Jolien De Graeve from De Kringwinkel states "as a social entrepreneur, we are mindful of other organisations in the building. It is sometimes better to lose money than not having a business in place." As such, they focus on a global approach with partners to ensure that they will identify solutions with all the partners – one of the topics of their bi-monthly breakfasts.

circuit © Marcelline Bonneau

**Major learnings on the installation of circuit**
The delays in construction, reflections upon the business model of circuit, were already detailed in Journals 4 and 5. At the end of the UIA project, what can be affirmed is that social entrepreneurship needs a specific approach, and at least some seeding money from public authorities. Combining the revenue sources and having a long-term vision is key as well.

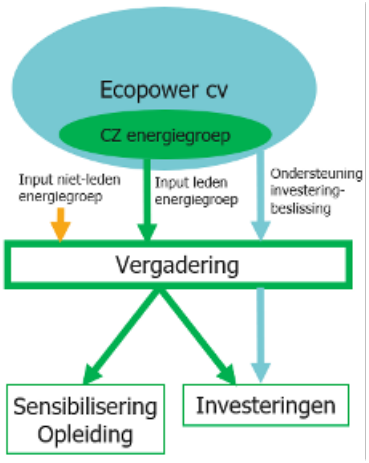
## 1.4 Activities

The concept of the **energy cooperative** has now been finalised and will build further on a local energy group Circular South. It is now coordinated by the community manager from circuit – with the technical support of Ecopower and possesses 81 members.

### The energy cooperative

The concept of the energy cooperative has now been designed as follows:

- Part of Ecopower cv; a cooperative with more than 60.000 members
- Joint investments for installation
- Profit goes to the energy group for the benefit of the whole neighbourhood
- Can bring together members as well as those interested to discuss what want to achieve for the neighbourhood
- Ecopower can support with concepts and investments



The Energy cooperative model © Ecopower

The cooperative can now benefit from the profits of the installation to develop further local activities or investments. (Digital) workshops were organised (17th March 2021, 27th April 2021, 27th May 2021 and 22 June 2021, 15 October 2021, 8 March 2022 to identify the interests and priorities of members: greening the neighbourhood, installing a wind turbine, … The first spending of the group will be for a bicycle repair and wash place, next to circuit. The energy group found a stable, future-proof way of work.

Beyond Circular South, the concept will be used in other communities. The new European directives and the Flemish translation of this create Energy Communities of Citizens and Renewable Energy Communities, in which Ecopower fits.

Meeting of the Energy cooperative on 22 June 2021 © Ecopower

**Major learnings on the development of energy cooperative**

The legislation for energy cooperatives is evolving constantly, making such energy communities still an experimentation: in terms of production and consumption of energy, as well as governance and wider impact on neighbourhoods. Adequate coordination and expertise have proven key – and will keep on being maintained to enable it best functioning in Circular South.

The **activities** of circuit resumed in summer 2021, with a steady growth since September. In particular, during the opening week from 19th until 27th of June, each day, activities were organised for visitors for free (e.g. DYI beauty essentials, visit to the heat plant, visit to nature areas, replanting plants, energy group). Since March 2022, a monthly thematic Programmation has started (on "green", "mobility", "plastic free", "food",... ). Different activities are being organised for visitors to get acquainted with the topics and to ensure as many people as possible can join circuit.


Workshop on DIY beauty products © Circular South

circuit seeks to be a facilitator and connector of different circular activities in the neighbourhood: activities are organised with the small businesses present on the spot and the "showcase wall" presents circular products from many local producers.

Last but not least, the **group purchases** have been quite successful, and circuit is envisaging launching a new one in September 2022.

The "showcase wall" at circuit © Marcelline Bonneau

**Major learnings on the activities of circuit**

Circuit is eventually in its final location in what will be the centre of Circular South. The activities are clearly targeted at local residents, but also beyond, seeking to create sustainable and circular life paths, as well as building up the local community. Partnering with local businesses has already proven to be key, as well as organising activities around themes. Further integration in the neighbourhood and creative ideas will be welcome to keep on stimulating local residents!

# 2. LATEST CHALLENGES, ADJUSTMENTS AND LEARNINGS

The latest challenges, adjustments and learnings of the project confirm the trends observed in the previous Journals. They also stress the path to be undertaken to ensure that the different activities of the project in its after UIA life.

## 2.1 A strongly committed partnership

During the very first visit to the Antwerp Circular South project, it was surprising to see that the partners did not know each other nor what they tasks were really in the project: project management and coordination seemed to be purely administrative, with distinctive work packages, with some linkages amongst each other but no real co-creation, exchanges nor co-implementation. The situation changed drastically after these first 6 months of rolling up the project. As Greet Brosens from Digipolis explained *"implementation and co-creation went smoothly given the large group of participating organisations and overall complexity of the project. All partners were genuinely focussed on delivering a good overall project and collaborated towards that goal."* That was the case even if all partners had their own working areas and expertise, of course. Some further synergies and shift of responsibilities also appeared thanks to this process and to make implementation more efficient and meaningful: the installation of PVs moved from the City to Ecopower. circuit is now coordinating the energy cooperative – even if their trajectories were at first totally separate in the project.

This did not stop by the end of the project *"All the partners worked very hard to finish all the deliverables of the project notwithstanding many partners already took up new projects. There were no issues and all the partners were very flexible. It was nice to see that there was a close group of people who wanted to finish this project at its*

*best.",* stressed Joren Hofman from the City of Antwerp. The "collective result-driven" was another adjective used to describe the partnership. Some collaboration also took place even if some partners had already finished their budgets. ( e.g. for connecting the smart meters with EnergieID after the project, we had good help from IMEC even if their budget was done.)

Some of the ingredients to this success might have been that the project was very well defined from the beginning. In addition, all the partners were open to discussions and tried to work out common solutions. They developed trust with each other along the years.

## 2.2 Transversality is still a learning process

Along the project, the lack of transversality of the administrating of the City of Antwerp was cited a few times if not as a blocker, at least not as a facilitator of synergies. Some partners were already part of the City administration, like Digipolis, the IT partner of the City of Antwerp: *"For us working together with the (other) city departments is "business as usual""*, Greet Brosens explained.

Circular economy tackles many different topics (e.g. economy, waste, climate) – with their own elected representative, none of them taking the lead on these, leads to a *"lack of vision or broadly-based policy plan on Circular Economy and collaboration with other departments"*, observed Joren Hofman. This can make the integration of activities tricky.

For example, partners wished to benefit from the PVs installed on the school and the social housing on the same site, for nudging and other experiments – yet, as these were managed by another department, it was impossible. At the same time, some collaboration was successful between city departments had to be promoted, for example for the identification of new buildings and sites for the installation of PVs (e.g. for the department of business and development for the wholesale market (Kielsbroek)).

Transversality of administration is a hot topic of innovative projects, even more so, for integrated ones. Local authorities still need to experiment on new forms to ensure they work in a meaningful and efficient way for more sustainable and circular cities.

## 2.3 Community in the long-term

One of the main aspects of the Antwerp Circular South project was to create a new – sustainable – community in a newly built neighbourhood. This has been challenged by the various covid restrictions, yet, the creativity of the partners and of the activities they developed – and will keep on developing, has shown the interest of local residents to form this sustainable collaboration. The activities have targeted the residents in general, as well as inhabitants from the social housing and students/youth.

The installation of circuit will be a major gamechanger: at last, a physical space, anchored in the neighbourhood, is giving the opportunities for activities to be organised locally, for all, with the participation of all those interested – e.g. via free activities and/or meetings of the energy cooperative. With the opening of circuit in its final location, focus has been on local residents (as opposed to the activities organised within PleinPubliek). For example, on 18 June 2021 a tour was organised for the people from the neighbourhood, to make them feel they were part of the project. They seek to keep the activities as broad as possible but will also work with coordinators of social housing to organise specific activities, also with printed flyers.

Residents are given the option to facilitate activities themselves and/or to take part in them. As mentioned in the projects' Evaluation on Community Engagement: *"An additional reason to link the future of the Circular South/New South community to circuit is the underlying shared set of values in the sustainable/circular ideal. With Circuit near - either directly or indirectly involved - the community's activities are more likely to remain aligned with Circular South's underlying principles of facilitating a transition towards a circular neighbourhood. It would help to keep the circular spirit alive ..."*

## 2.4 UIA outputs are concrete, visible and long-lasting

The innovation, experimentations and added value of the UIA funding will remain in Antwerp Circular South and within the activities of the partners.

The **(BI)PVs** and the **cooperative neighbourhood energy group**: the community solar panels are installed, and the cooperative has been set up. With the returns from the solar energy, the group will invest in the sustainability of the neighbourhood. The community manager of circuit will continue to support the group for the coming year. Ecopower will advise them on major projects and big investments. Ecopower will also extend the way of working to other communities, as part of the H2020 SCCALE project.

The **battery simulator** is useful and will be used in future projects to bridge the gap between pilot experiments and the actual experiments with the users. Such a simulator can be used to analyse the data but also as a

preparation for actual experiments. It can also support in convincing building owners or operators to install batteries, as well as to discuss the added value of PVs.

**Circular South app**: a new version of the app is available for all Flemish people. More and more people are getting digital meters for their water, gas and electricity and they will be able to link this data to the app to monitor their usage. Fluvius (Flemish energy provider) already ensured that their clients can link their gas and electricity data to the app. In the future, other data may also be made accessible via the app.

**circuit**: De Kringwinkel Antwerp owes a 50-year concession on the community centre and will remain responsible for circuit, in order to bring people in an easily accessible way into contact with circularity and sustainability.

**The Group-purchase platform** is now created with the possibility of people having a very low-threshold manner by which to come into contact with sustainable products and companies. A new purchase is planned in September 2022.

**Community**: from Circular South, a seed of enthusiastic residents who take initiative has been planted and is growing. With a grant of the Flemish City Renewable Fund circuit will organise activities on circularity and sustainability and further invest in community building in New South.

# 3. CIRCULARITY AS A NEW FRAMEWORK FOR CITIES

Circular economy is high on the local and European agendas (seeJournal 1). The City of Antwerp had been experimenting for a decade in districts to increase the circularity energy provision, air quality protection, water supply and waste management. New South district, was perceived as the testbed for new energy practices related to air quality, renewable energy, grey water recovery and circular district heating, and for community engagement and city co-creation with local residents. The innovation of the Antwerp Circular South project was to combine offline and online activities, putting them together in a complex way combining research and practice, technical digital and social innovations.

Developing a circular approach in European cities requires: the need to adopt a specific attitude from the city administration in being creative and innovative and to get the right team on board combined with the need to have a strong coordination, the importance and interlink of co-creation and community engagement, ongoing readjustments related to the works on the site – and a related resilience, the need to rethink regularly the (geographical and time) scope of the project, the covid-related challenges, the societal timing of the activities, the political dependence, the use of data collected, the need for transversality, adequate resources and skills, and partnership ...

This project has shown that circular economy can be more than a concept - overused and has been manipulated according to each individual interest: it can be a framework to support the transition of European cities towards more sustainability and circularity moving towards other approaches and paradigms to ensure the viability of our planet. This story is shared online by the project.

# THANK YOU!

This last journal was written based on the inputs provided by a visit to the project on 8 March 2022, email exchanges and online discussions on 9, 10 and 11 March 2022, with all the partners:

- Joren Hofman, project coordinator from the City of Antwerp;
- Vincent Dierickx, EnergieID;
- Jim Williame, Ecopower;
- Carina Veeckman, IMEC;
- Raf Ponnette, Vito EnergyVille;
- Jolien de Graeve, De Kringwinkel Antwerpen;
- Greet Brosens and Tom Sluyts, Digipolis

I would like to thank all the partners for their inputs, reflections and sharing of experiences during the years I followed this project, making my work human, concrete, enjoyable, continuously demonstrating that a new city and a new way of making real are possible.

UIA sign by the heatplant © Ecopower

Circular economy

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