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Author:  
**Marcelline Bonneau**  
*UIA Expert*



The Urban Lab of Europe !

# The ANTWERP CIRCULAR SOUTH project Journal N° 4

*Project led by the City of Antwerp*



**CIRCULAR  
ECONOMY**



# The ANTWERP CIRCULAR SOUTH project

The Antwerp Circular South project aims to position circularity as a community challenge for the New South district (a newly created district in Antwerp) and to engage its new residents in co-creating online and offline initiatives to change their consumption behaviours. A number of advanced technical solutions covering different resource streams (energy, water, waste and materials) will be tested.

200 Circular South inhabitants will experiment with the so-called ‘behavioural nudging’, receiving cues to adapt their consumption behaviour of energy, water, waste and materials in the most ideal circular way. Circular behaviours will be automatically rewarded by an online token, the Circular token – Circules, through a blockchain-based reward and exchange system. A part of the most engaged Circular South participants will form a local energy community co-owning of an innovative collective energy system. In addition, a Circular South Community Centre – CIRCUIT will be set up to host a number of initiatives related to sharing, repairing and reusing activities. CIRCUIT will reach out to a broader group of citizens in opposition to the more limited group of 200 participants in the behavioural nudging experiment.

## **The project is composed of the following partners:**

- The City of Antwerp;
- VITO/EnergyVille;
- Digipolis;
- Imec;
- Pantopicon;
- EnergieID;
- de Kringwinkel Antwerpen;
- Ecopower.

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# 1. EXECUTIVE SUMMARY

The Antwerp Circular South project is well into its last year of funding. Although the last journal showed that the project was finally becoming concrete, the partners feel now some stress and worry in order to ensure achieving what they were bound to achieve within this project. Most of the worries relate to the difficulties of implementing a project in a newly built neighbourhood, of the fluctuance of human interest and willingness to change (behaviour), the evolving market, the time required to proceed with creative solutions, and difficulties related to the inherent structure of municipalities. Technical as well as social innovations are facing their main challenges in relation to the lack of control and power over the achievements of given results in a given timeframe in a given manner.

Yet, it goes without saying that the project has continued implementing its activities. A Public Procurement for PVs, BIPVs and batteries has been launched in January 2020, for the first investment (at PleinPubliek), final negotiations with providers are ongoing before moving to installation of the shared energy system. For other investments, a framework contract is prepared in anticipation of investment decisions following ongoing negotiations. This will allow for swift realisation when decision is made.

Thanks to the installation of smart meters, finalisation of data treatment and procedures, design of the app, linkage to existing data,

preparation of the blockchain reward mechanism and recruitment of volunteering residents, nudging experiments have now started: one has already been carried out on energy, 5 more are on the way. The first experiment has shown interest and motivation and a wish to know more about the ways to reduce energy consumption at home!

The Renewable and Citizen Energy Community is now growing, expanding to other areas of the South of the city. CIRCUIT is running fully, planning its future in its final location. Its business model still needs to be refined. Further actions are taking place with residents and citizens of Antwerp: the 2nd wave of the waste campaign, “FC Minder Afval”, and a deposit and green waste challenge are on their way, even though they face some delays and administrative complications.

The issues faced by the project since its beginning are still present. Yet, some specific aspects are becoming more prominent now: showing the added value to both residents and owners of buildings to take part in the PVs scheme and Renewable and Citizen Energy Community; realising the over optimism of the proposal; managing the political dependence of some actions. As such, Antwerp Circular South projects itself in the future and wishes to learn and share even more about what it has done and what it has struggled with.

## 2. WELL INTO THE PROJECT, BUT FAR ENOUGH?

Since the beginning of the project, tensions have been at its core to ensure not only reaching out to the foreseen KPIs, but also and merely to implement what it promised. As was detailed in previous journals, the project has faced the limitations of taking place in a newly built area: limited number of people having moved to the neighbourhood already, difficulties to recruit new residents who have other priorities, facing the reality of unbuilt buildings – e.g. amongst others affecting the implementation and real-life experimentation of CIRCUIT. At the same time, the project seems to be ahead of its time and leads to difficulties in procuring and installing PVs, BIPVs and batteries, as well as data integration and move towards being a smart city.

The project and its team have been very creative in finding solutions and always moving forward. CIRCUIT is taking place on a temporary location, benefitting from the attractiveness of sustainable entrepreneurs and nightlife atmosphere of Plein Publiek event organiser. Data from VITO/EnergyVille’s PVs is used as a benchmark for the app, instead of that of - not yet installed - New South. The project has signed up to the OASC model mechanisms for treating data in the most operational and ethical way.

Yet, at this stage, whereas partners have entered the last year of project, although the majority of the project has been implemented, and with

quite some success as will be detailed in this journal, major worries remain: *How can the partners ensure they will reach their KPIs? What if they do not? Will this affect the quality of the project? Will this affect the co-funding of the project? Notwithstanding the willingness and anticipation from the partners, will the project be sustainable after the funding period?*

Far from being pessimistic, this Journal will not only address these main questionings but also show the great advances of the project and in particular its key highlights:

- The launch of the second waste challenge, “FC Minder Afval”, with more than 600 participants throughout the city
- The launch of the first nudging experiment with the app, with 46 participants, with real-life test, including reward of Circules (virtual token)



*Launch of “FC MINDER AFVAL”  
(Source: Circular South)*

# 3. TOWARDS THE END OF THE PROJECT

The project has entered its last year. Even though not all the project is being implemented as was designed, and applied for, at first, the main structure for implementing and testing the actual

change of residents’ consumption of energy is in place. The first test has been implemented and learnings for the main objective of energy consumption transition can start to be drawn.

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

*Update on the ANTWERP CIRCULAR SOUTH project (Source: UIA Expert)*

## 3.1 Technical devices

Installing **PVs** (Photovoltaics), **BIPVs** (Building-integrated photovoltaics) and **electricity storage systems** remain the most challenging part of the project. Even so that they correspond to a large share of the project’s budget, which could entail some financial penalties if this part is not implemented.

Public Procurement for BIPVs and Batteries has been successful. Plein Publiek, where CIRCUIT is based, had long agreed to host PVs. Yet, the consortium which was supposed to install them fell apart. A new procurement is on its way. Public procurement for PVs in Plein Publiek has been launched as well in January 2020.



*Pleinpubliek view from the sky  
(Source: Circular South)*



*Building 17 (spaces) from the sky  
(Source: Circular South)*

The main issue remains the location where the PVs will be installed. At the moment, there is hope for a few places to finally agree to install PVs on their roofs, although with many caveats:

- Building 5, Domitys: the Domitys management team has changed totally which led to negotiating all over again. Yet, partners are quite optimistic about the outcome of discussion due to the high interest of the new management;
- Building 3 (Greendesk), offices: negotiations are still on-going. At first, the owner was not so much in favour of the project and change of contact with estate agent caused delays, have kept the discussion open to a new proposal made in February 2020;
- Building 17, Triple Living offices (Spaces): The real estate owner, Triple Living is starting to value the installation of PVs on its buildings in terms of energy certificate, in turn increasing the economic value of the buildings. The building is due to be delivered on the 31st of December 2020.

The main question here relates to the timing, and whether, bearing in mind negotiation, agreement, public procurement and installation, the project will still be able to carry this out before December 2020, the official end of the project. In order to secure this, partners work to prepare and procure a framework contract, which will allow for swift realisation when decisions and formal agreements are obtained. For example, in the case of Building 17, the roof is expected to be finished earlier but a strict planning and good understanding between contractors and the appointed supplier of the PV system will be crucial.

The project also sought to expand beyond the project area:

- Private building Amerikalei, private building, currently being investigated with a high interest and engagement of residents (limited area for PVs);
- Zorgbedrijf, retirement home combined with service flats and social housing, very recent, investigation has just started;
- Zuidervelodroom, single family houses and apartment buildings, with a strong community engagement, signs that at least 10 single family homes and one apartment-building will join the project.

The overall size of PVs and BIPVs, and the existence of batteries to be installed, as well as

the amount of energy potentially produced by these installations are presented below.

Building	Rooftop PV panels surface	Rooftop PV energy	Other PV surface	Other PV energy	BIPV surface	BIPV energy	Batteries vs 100 % autoconsumption
<b>Main project area</b>							
Building 3	238 m <sup>2</sup>	46 kWp			25 m <sup>2</sup>	3,8 kWp	100% autoconsumption assumed (no batteries)
Building 17	260m <sup>2</sup>	50 kWp					100% autoconsumption assumed (no batteries)
Building 5	516 m <sup>2</sup>	100kWp					100% autoconsumption assumed (no batteries)
PleinPubliek	170 m <sup>2</sup>	33 kWp	200 m <sup>2</sup> of façade pV 38m <sup>2</sup> of parapet PV	28kWp on façade 3,7kWp on parapet			60kWh of batteries
<b>Expanded project area</b>							
Private building Amerikalei	85 m <sup>2</sup>	16 kWp					Smart grid to optimize autoconsumption. (No batteries)
Zorgbedrijf	600 m <sup>2</sup>	129 kWp					160 kWh of battery capacity
Zuidervelodroom	374 m <sup>2</sup>	72 kWp					80 kWh of batteries

*Size of PVS, BIPVS, and existence of batteries, and amount of energy potentially produced<sup>1</sup>  
(Source: UIA Expert based on Circular South Inputs)*

The city real estate department rejected all the proposals on behalf of their clients, the school organisations and the sports and leisure department, hosted in building 10. It had already planned its own PV installation, providing energy produced for free. The Circular South project was unable to target the end users and explain the added value for them to accept their offer: users would need to pay for the energy produced on the roof, but in return, would get a lower annual fee for the use of the building. The message never reached the end-users and the city real estate department will implement its own system, in turn keeping the control over it, which is another key factor on not wanting to be part of the UIA scheme.

PVs on social housing in buildings 7, 8 and 12 are already installed (even though outside the UIA

project). In building 4 (residential), which is finished and now inhabited, the proposal was not accepted by the association of co-owners who did not see any interest for them in it.

Outside the project area, the project also sought to get access to other public buildings owned and maintained by the city of Antwerp (cultural buildings, schools, sports and leisure and offices): they have their own elaborate programme for the energetic renovation of their assets. Gerlache-building, a high-rise apartment building in the fringe of the New South project area was also one option: the rooftop however, is not suitable for instalment of PV-systems because of its lack of large flat areas. Therefore, these options outside the project area were eventually not pursued.

<sup>1</sup> The figures are not exact: these are estimates based on initial discussions with all the members of the schemes. In particular, for the expanded area, negotiations have just started and figures might change greatly.



The **smart meters** (plugs and sensors) are now purchased and installed for the nudging experiment (see below).

## 3.2 Back-office modalities

The **Community of New South** is growing, with on-going recruitment and actual participation in challenges and in the nudging experimentation. Further events and activities are organised in order to foster discussion and interaction between residents on the future of CIRCUIT, as well as to promote the nudging experiment and the new waste campaigns.



*Co-creation / community building circuit & CIRCULAIR ZUID:  
'KOFFIE MET DE BUREN'  
(Source: Circular South)*

The **Transition board** has been delayed: the focus of the project has been on residents' recruitment and launch of the nudging experiments. In addition, it appeared more long-lasting to identify

and recruit the originally foreseen experts, including to finalise the procurement. The experts have now been recruited, and it is expected that during the last year of the project they will fulfil a shifted role, i.e. of positioning the project within the larger societal transition towards circularity and sharing insights to benefit other initiatives within the wider European context. Activities are under preparation to support the experts in this new role, arriving later to the project than originally foreseen.

The content of the nudges (rules, text, prompts) have been fully developed. The preparation of **data treatment** and integration as well as **business logic** for energy and waste, endpoints for ACPaaS data, virtualisation, Customer Energy Management System, and **blockchain** reward system procurement have enabled to fully implement technically the nudging experiments. In particular, a PV-Battery lab set up is being organised at VITO EnergyVille in order for the coupling of PV and battery virtualisation with real PV and battery to be tested: the energy produced by PVs at some of EnergyVille's buildings serves as preliminary data for the application, until the New South PV installations are operational.

Nudges have been tested in a first technical experiment (Jan-Feb) on energy consumption. A second experiment on energy is on its way. Further details about the nudging experiment can be found in the Second Zoom-In of the project.

## The nudging experiment

In January 2020, the Circular South Project started with its “nudging experiments” to test some innovative ways of supporting consumers in changing their energy consumption behaviours. The first experiment took place over one month, combining online and offline interactions, technical and soft infrastructures, and academic research and actions on the ground. 46 volunteers tested the technical and informative aspects of the application to receive information about their energy consumption, as well as getting prompts for changing their behaviours. Overall, as was shared during a feedback moment on 4 March 2020, the volunteers were very happy about the test, asking for more generic information about households’ energy consumption and the need to care about it, as well as asking for greater details about their consumption. They were also enthusiastic about the reward they received from their savings. Finally, they noted that they had adjusted their behaviours according to the prompts given to them. The other upcoming experiment will further test the actual effect of the app on energy consumption.

### Timing: experimentations 1 - 6

	Experimentation 1	Experimentation 5 & 6	Experimentation 2	Experimentation 3 & 4
<b>Theme</b>	Energy	Waste	Energy	Water
<b>Duration</b>	4 weeks	8 weeks	4 weeks	4 weeks
<b>Start</b>	Week 6 (3 February)	Week 10 (2 March)	Week 20 (11 May)	Week 25 (15 June)
<b>End</b>	Week 9 (28 February)	week 18 (1 May)	Week 23 (5 June)	Week 28 (10 July)
<b>Interviews/ survey/focus group</b>	Week 10 (2 March)	week 19 (4 May)	Week 24 (8 June)	Week 29 (13 July)



*Foreseen nudging experiments  
(Source: Circular South)*

The **recruitment of repair buddies and makers** is still going on within CIRCUIT as part of the wider strategy: 3 volunteers are already part of the project as repair buddies and making it alive

within the local community. A few makers (especially those already hosted at Plein Publiek), e.g. W.R.Yuma the sustainable sunglasses makers, are in discussions for the future CIRCUIT as well.

### 3.3 Interface

In the last six months, functionalities of the **application** have been expanded, and some major features have been added:

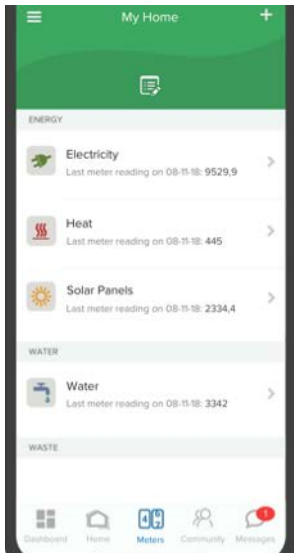
- Data views have been updated and now also include virtual energy measurements: participants can see their own PV-production, even though they physically have no PV in their apartments (this is a projection of their actual consumption, based on the VITO EnergyVille PVs);
- The blockchain reward system now has features to exchange the collected rewards for Antwerp A-points<sup>2</sup>, or to participate in a crowdfunding for group rewards organized by the city;
- Users can receive rich text messages from the nudging system, and notifications will be sent to their devices.

In the backend, more telemetry of the app's usage has been added. This means that the nudging system can now receive data about people's app usage (time since their last log-in, number of messages that are left on unread, ...): this enables specific nudges to be sent taking those variables into account. In addition, the full admin-panel for the blockchain reward system has been completed. The partners can track the status of challenges, transfer Circules if needed, and initialize custom crowd-funded rewards.

The application is currently being tested in the nudging experiment. From the first received feedback, participants would have been happy to receive more information about their waste, currently only monitored as large or small and frequency. At the same time, De Kringwinkel Antwerpen would have also been interested in monitoring the physical stream of material (waste) in a more specific way, by products. Unfortunately, technical requirements and project timing prevent from implementing such changes.

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<sup>2</sup> Each resident of the City of Antwerp possesses an A-card which enables using some public services, getting some rewards and access to social benefits. Via the data stored on their card citizens can access underground waste disposal, city bike services, library services, sports facilities, ... It also seeks to drive more frequent participation in cultural, sporting and other leisure activities of, and in the city, by informing, stimulating and rewarding participation: each time A-card users visit locations such as libraries, swimming pools, cultural centers, museums, ... (more than 100 locations), they collect A-points which are converted into a digital discount voucher, valid for 6 months (e.g. 1 free swim in an urban swimming pool; 2 euro discount when purchasing a ticket with a cultural partner, an entry ticket to an Antwerp museum, on a purchase in the Antwerp city shop, one of the museum shops or the city's EcoShop, ...). Finally, via information available on the card, citizens can get direct access to social benefits e.g. at the swimming pool, library, museums or theatres.



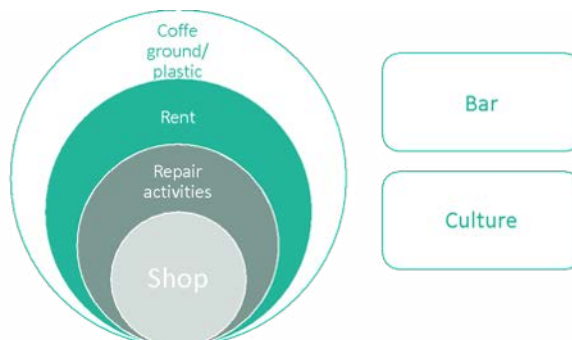
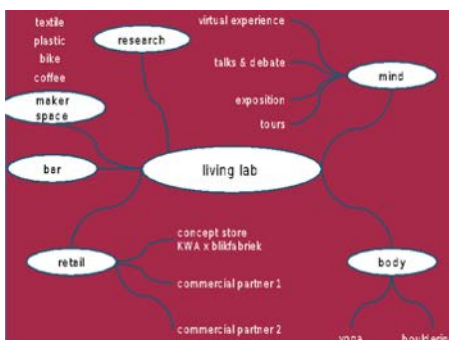
*CIRCULAR SOUTH app  
(Source: Circular South)*

Now that the building for the future location of CIRCUIT, so-called Palazzo Verde, is bought, the future business model of CIRCUIT is currently at the core of the reflections of the partners. It is still at its very beginning: calculations have been made about the needs for revenues, however its sources are not fully defined, nor planned in time. Some planned activities are:

- Activities for repairing (e.g. bikes, cloths)
- Letting rooms for entrepreneurs
- Developing activities in relation to coffee grounds and plastic

All these with alongside a bar and cultural activities, in order to promote a more sustainable way of living.

- A shop for products created and repaired at De Kringwinkel Antwerpen



*CIRCUIT concept and planned activities  
(Source: Hannes Dams and UIA Expert based on Frank Dingemans' inputs)*

### 3.4 Activities

The **Energy cooperative** formerly named “Citizen Energy Community” is now called “Renewable and Citizen Energy Community” to better fit the closer to EU directives (see table below).

Article 2(16) Renewables Directive – ‘Renewable Energy Community’	Article 2(11) Electricity Directive – ‘Citizen Energy Community’
A legal entity that:	A legal entity that:
(a) which, in accordance with the applicable national law, is based on <b>open and voluntary participation</b> , is <b>autonomous</b> , and is <b>effectively controlled by shareholders or members that are located in the proximity</b> of the renewable energy projects that are owned and developed by that legal entity; (b) the shareholders or members of which are <b>natural persons, SMEs or local authorities</b> , including municipalities; (c) the <b>primary purpose</b> of which is to provide <b>environmental, economic or social community benefits</b> for its shareholders or members or for the local areas where it operates, <b>rather than financial profits</b> .	(a) is based on <b>voluntary and open participation</b> and is <b>effectively controlled by members or shareholders that are natural persons, local authorities, including municipalities, or small enterprises</b> ; (b) has for its <b>primary purpose to provide environmental, economic or social community benefits</b> to its members or shareholders or to the local areas where it operates <b>rather than to generate financial profits</b> ; and (c) <b>may engage in generation</b> , including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders;
<small>While not part of the definition, RECS are entitled to produce, consume, store and sell renewable energy, including through renewables power purchase agreements, to share renewable energy within the community, and to access all suitable markets</small>	

*Energy community definitions  
(Source: H2020 COMPILE)*

The Renewable Energy Community seeks to on the one hand to enlarge its sun sharing system and on the other to further recruit members:

- Ecopower is seeking to engage owners of the social housing (buildings 7, 8 and 12) who have their own PVs to be part of the Renewable and Citizen Energy Community. It is also seeking to expand its zone to the Zuidervelodroom area (close to New South) for PVs installed both on apartment buildings and on individual houses. A workshop was organised on 10 October 2019 to present the project and a follow up one on 3 March 2020 on developing activities within the Community.

- So far 37 members. Ecopower is planning additional recruitment communication and is confident that the goal of 80 members will be reached by the end of June 2020.

Yet, partners note it is still difficult to invite citizens to join without the existence of PVs in the Circular South project area, and without locally produced energy.

The **circular token “Circules”** is fully integrated into the nudging experiment (see above).

The second edition of the waste **100-100-100 challenge** has been named “FC Minder Afval”, “The cleanest Club of Antwerp”. It was launched on 27 January 2020 and will run until the end of May 2020 to the whole city. 660 participants have signed up to it, out of which 16 from New South<sup>3</sup>. This campaign has benefitted strongly from the support of the communication team of Antwerp. The third edition will be organised from June to October. The structure of these campaigns is the same as the first one organised in 2019: the tasks are changed; new suggestions and examples are given. The same questionnaire is also shared upfront and at the end of the campaign. For the second edition, participants also received a zero-waste start kit. Links to CIRCUIT’s activities are made clear, for example when a repair café for smartphones is organised, and information is shared mostly via Facebook.

<sup>3</sup> The total number of participants accounts for 1,32% of the total Antwerp population (500 000), whereas the number of Circular South participants account for half of this rate, 0,6% (2733 total inhabitants in the district in March 2020). The project would have been happier with better results, yet, with regard to the issues faced to recruit local residents, which then encouraged to the project the expand its geographical area (see previous Journals), this number appeared to be a reasonable success.



FC MINDER AFVAL, zero waste starter kit  
(Source: Circular South)

The project is organising a **green waste challenge**. 4 out of the 15 planned sessions have been organised around the two composting units which have been installed (at Plein Publiek and Domitys). Yet, the contract for management of composts, which is the responsibility of the City waste department, under the Alderman for housing, heritage, urban and neighbourhood

maintenance, green spaces, animal welfare, healthcare and senior care – not part of the project, is not renewed: the project’s agenda is confronted to other department’s agenda which it cannot control. As such, the project currently seeks a new partnership, which could be with the former composting manager of the City.

The **plastic deposit challenge** is well developed (see box below). One of the main challenges is to get the message well across: plastic should be reduced and not enhanced, at the same time as this challenge is an alternative to existing city-wide sorting system. However, the other current most important challenge is to actually get the official, City’s, approval to carry out this challenge, which could be seen as a competition to the existing sorting system of the city of Antwerp. There will also be some links to the waste campaign where tap water will be promoted.

## The plastic deposit challenge

The plastic challenge seeks to collect plastic bottles and caps from residents in order to 1) raise awareness about the quantity of plastic they use and prompt them to reduce this quantity 2) recycle and reuse this plastic. The material will be collected via two reverse vending machines: one at CIRCUIT and another one in another location/shop of De Kringwinkel Antwerpen. The collected plastic will be used for the following: research with the University of Antwerp on the use of caps for elements of climbing walls; creation of a washing line to cut plastic into smaller pieces (clean flakes) as raw material or for example for Yuma’s glasses; research for new plastic development, for bottle-to-bottle recycling.

In exchange, participants will obtain discounts for products or access to CIRCUIT’s workshops for free.



Deposit challenge infographics  
(Source: Circular South)

The structure of the **group purchase** has been designed and is now being implemented. Whereas the City of Antwerp needed an intermediary organisation to take care of this process, it recruited De Kringwinkel Antwerpen to proceed. The team is currently preparing the list of criteria for the purchase of the 10 products which will be made available via this scheme: circular made product, products designed for disassembly, activities...

**CIRCUIT's** team has been strengthened by the recruitment of a new communication officer. It has put a lot of efforts on organising school visits and on events to strengthen the brand 'Circuit' alone or in collaboration with various partners (e.g.: Plastic Free Festival, open-air inspiration evening – flea market and bicycle market, bicycle repair cafes, DIY workshops, textile repair cafes, ...) with a total of around 300 participants.



*IKEA team-building and collaboration  
co-creation with circuit  
(Source: CIRCUIT)*



*DIY workshop (20/12/19)  
(Source: CIRCUIT)*

CIRCUIT has also sought new ideas and opportunities and has for example worked with IKEA to identify some possibilities to collaborate. Although CIRCUIT manages its activities with a limited budget – which did not anticipate all the needs for all the activities to be carried out – this budget would need to be revised in the future to further develop its activities, especially in the new – final – location.

## 4. ONGOING CHALLENGES AND ADJUSTMENTS

The issues faced by the project since its beginning are still present: the need to adopt a specific attitude to overcome the project's challenges, combining traditional and innovative skills and competence, the difficulty to co-create and engage, the struggle to take place in a newly built district, the integration of offline and online

activities, the change of project coordinator, the specific state of mind for being innovative, the timing of the project, or maintaining the interest of residents. In addition, the project is increasingly facing the challenge to prove its added value, to face its strict timing beyond its initial optimism and political dependence.

### 4.5 The tricky showcase of the added value of the project

*Don't we have a good story? Are we too demanding? Are we promising things we cannot realise? Is the process too slow for residents? Isn't it dealing with a burning question?* Here are new and recurring questions asked by the Circular South team. Although in the previous journal we described a change of situation by the fact that many aspects of the project were eventually becoming concrete, partners are, indeed, still struggling to showcase the added value of its different elements to the different partners.

The installation of PVs appears to be limited as, for example in building 10 – the school, owners – the City of Antwerp, want to have the control of it. They could be interested in joining the Renewable and Citizen Energy Community. Yet, they would not join the PVs scheme. Their lack of control over energy production can explain some of it, the fact they would have limited financial gain from it can explain more.

Similarly, convincing residents to join the Renewable and Citizen Energy Community is difficult because of the lack of realised PV and storage systems by the Circular South project and as such the lack of local energy production: the

future seems unclear to potential participants, bearing in mind they need to buy shares to join the Community. As Hilde Haex explained: *"The lack of visibility of concrete products inhibits the necessary multiplier effects actively aimed for in the recruitment process, i.e. onboarded members feel less inclined to bring neighbours, new members on board. Their attitude appears to be more of "first wait and see". One clearly feels the envisioned end state of the project has not enough pull to fully engage them at this stage. Hence, most recruitment successes rely on face-to-face, one-on-one encounters, rendering the overall process much more time-consuming."*

Similarly, the app does not show the financial value of reducing energy consumption. It is worth noting though that the project had never been about showing financial value of energy savings. As such, this was never foreseen as a game-changing feature in the recruitment process.

Is it all about money then? Maybe not. Many residents and participants to the different schemes (Renewable and Citizen Energy Community, nudging experiment, waste campaigns) do understand that all of us need an



energy transition right now, and as quickly as possible to mitigate as much as possible our impacts on greenhouse emissions and climate change. Others are interested in actually getting to know more about the rationale behind it, studies and research, and assessment of their individual impact. Yet, for those far from these preoccupations, the financial concern is on the most stringent one.

Antwerp Circular South is currently therefore still seeking the best narrative for residents and

building owners to invest in their future. And as Jan Pecinovsky says: *“We remain optimistic about it all, because to us this is the reality of the energy transition. There are always some people who somehow believe that one day a project like this is going to come along and solve all problems, like some deus ex machina. The reality is however that these things are difficult, and progress is slow. Every bit of effort helps, so we should not be deterred by these issues and just crack on.”*

## 4.6 Beyond the initial optimism of the project?

*“The clock is ticking”* worried Raf Ponnette. More than during any of the previous visits to the project did it feel like under pressure, stress and fear, not to reach the planned goals: KPIs as well as broader objective of changing energy consumption behaviour.

*“We were too optimistic at first”* said Maud Coppentrath, the project coordinator. *“Recruiting residents was the big unknown, we did not know how people would react”*, commented Hilde Haex. *“We underestimated the effect of moving into a new neighbourhood”* added Sam Verbelen. He went on: *“We are constantly reflecting on how things could have worked out better. Where did we go wrong and what can we still do to improve, or how should we approach if ever granted a likewise opportunity.”* Christine Van derslijen

stated that it was difficult to reach the promised target in terms of number of participants, investments... Maud Coppentrath tried to analyse: *“the main reasons for this are the complexity of the technical tools, dependency on external parties, complexity of internal processes, the lack of political support”*.

However, partners are still looking for creative ways to work around possible issues. As Hannes Dams stated, *“I do believe that optimism can be a deliberate choice and that it is our duty to seek for the hidden opportunities rather than demoralize ourselves staring at the setbacks.”* Summer months and weather might help. Moving on with the building of the site will for sure support the higher integration of all the aspects of the project in a single visible and central location.

## 4.7 Political dependence

The project is dependent on the organisational structure for many of its tasks. Currently, the most pressing and challenging ones relate to the green waste and deposit challenges. Regarding the composting challenge, the organisation in charge of composting units in Antwerp has now finished its contract with the City. There is a need to launch a public procurement or a contract with them to

support the end of the Circular South Project. Yet, it is unclear whether this will be accepted, and which form it will take, causing uncertainty and for sure delays in the green waste challenge.

The deposit challenge relies on a decision to agree the collection of plastic bottles and cap for the challenge, although a private company,

FostPlus, has the monopoly over the collection and sorting out of PETs in the city. For Christine Van deslijen, this is a frustration but also a worry when a team of volunteers, entrepreneurs and students believe in the project and are on the

starting blocks. Whether this will be approved or not is still unclear and will in any case cause delays. Another option will also be to focus on the collection of bottle caps, as it is already the case in many parts of Belgium for charities.

## 4.8 The difficult analysis of the project's' initial outcomes

Now that the first nudging experiment has been carried out, a first analysis of behaviour shift can take place. The first data shows that there was an overall decrease of washing cycles between January and February 2020 (479 against 561), and during the promoted timeslots – 11h and 15h (171 vs 227). At the same time, the decrease was not statically significant.

The data also showed that, on average, 46 participants used their washing machine 10 to 11 times in February and the majority did so outside 11h and 15h. Only 5 participants washed more between 11h and 15h, than outside 11h and 15h.

Data was also compiled about the number of nudges sent, but especially read. For example, in total, 111 nudges were sent and read by 26 participants to thank participants that they used their washing machine between 11h and 15h.

The main focus of the experiment was to test the technical performance and the user-friendliness of the app, whereas, in the second experiment, more advanced nudging techniques will be used to shift behaviours.

This project proves the complexity to assess behaviour change:

- Getting an adequate sample: in this case, most of the participants were retired, have spare time, and are flexible to change habits. Because of the limited number of profiles, the data can therefore not be generalised.

- Balancing between a sample big enough for statistical generalisation, or small enough for in-depth qualitative analysis: the size of the sample (46) does not enable robust statistical analysis (widening up the rest of city might enable this). The information provided is yet extremely valuable as an in-depth qualitative analysis and specific case study.

- Outside a controlled environment: External factors such as personal lives, information inputs from other sources, types of home appliances, etc. can influence the (lack of) reaction to the nudges. Ensuring the exact reaction to the nudges would require long-term and in-depth analysis of the involved households and further in-depth investigation of the effectiveness of reading nudges versus other external factors.

- Lack of pre-experiment data: assessing the changes in behaviours needs to be done against data anterior to the experiment, at least one month before the experiment (ideally a year, but this is not possible for all types of data for the UIA project). This will be followed-up for the next experiments of the project for water, waste and also electricity.

In conclusion, the data from this first experiment can for sure show the evolution of the consumption pattern of participants. Yet, it cannot assess the direct impact of nudges. There has been no significant shift in terms of usage of the washing machine, although there was a decrease of the number of cycles for the

promoted timeslot. Participants are on a learning curve for using the application, as well as to adjust their habits to the follow up the received

## 4.9 The future is today

One of the biggest learnings of the project in the last six months is that partners need not only to focus on achieving their planned results but also to start seriously to plan and think about the future, the after UIA phase. Some of the outcomes of the project have promising futures<sup>4</sup>:

- Both the deposit challenge and the group purchases could have a long-term equivalent in the coming years and could be renewed by the City;
- The PV installations could trigger positive reactions and a willingness to join the Renewable and Citizen Energy Community;
- Links with the “climate streets”<sup>5</sup> in Antwerp could expand the opportunities of the Renewable and Citizen Energy Community;
- The sun sharing in Zuidervelodroom could broaden the possibilities for the collective investments in the Renewable and Citizen Energy Community;
- CIRCUIT can pivot from being a place where there is room for experimenting to a concept with a clear focus and a consistent revenue stream that is significant enough to become self-supportive. It is currently working on its Business Model to ensure this. Further in time, it could become a vibrant place where people like to get inspired and are challenged

nudges. Along time, the effectiveness of the nudges needs to be further assessed in the upcoming experiments.

to live differently without giving up on comfort; and,

- The digital electricity (and gas) meters are finally in rollout in Flanders. This will enable all those wanting to, to use the app which has been developed for better insight in the energy consumption.

This is also the stage where the intrinsic motivations of the partners in taking part in the project arise: public sector seeking to follow-up on coordinating the project for two more years, private sector focusing on finishing its current contract in the best possible way, research partners looking for further research in this domain, NGO stakeholders looking for the long-term added value and commitment to continue this 3-year work in the long run. As such, the partners have already started in developing their own interest in the future of the UIA project together:

- The project organised two stakeholder meetings to think collectively about the future of the project in September 2019;
- The city of Antwerp, VITO/EnergyVille and EcoPower have applied for an H2020 project for a continuation of the smart homes and energy group, engaging social target groups;
- De Kringwinkel Antwerpen will remain in charge of CIRCUIT, which will be fully launched at the end of the project only.

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<sup>4</sup> This journal was written before the upcoming of the Covid-19 crisis and some of the plans might need to be readjusted once the quarantine is over.

<sup>5</sup> “Climate streets” are part of the “Climate Plan” to support transition towards carbon neutrality, where inhabitants of given streets gather to work on climate change issues. Some residents are already interested in this project: the learnings and methodology could be applied there, benefiting from prior approval of residents for installing PVs on their roofs (one key issue in this UIA project).

Other partners will develop their own activities, individually or with other partners:

- EnergieID, Digipolis, Pantopicon, and IMEC will integrate the learnings of this project in

their daily work, continuing to support the transition towards more sustainable energy practices.

### 4.10 Overview of challenges

Although the above-mentioned challenges stress that many issues are on-going within the project, the UIA challenges are quite well addressed,

except for the organisational arrangements within the urban authority. They can be summarised as per the table below.

#### MAPPING ANTWERP CIRCULAR SOUTH AGAINST THE ESTABLISHED UIA CHALLENGES

Challenge	Level	Observation
1. Leadership for implementation	Medium	In the past 2 years, the project has proven to have a solid team within the department in which it operates: together they drive the project forward as well as are creative in solving upcoming issues. The team is also supported by its responsible Alderman (for social affairs, poverty reduction, community building, social economy, environment and worship). At the same time, notwithstanding its strength, the team has felt isolated and uncertain from the political levels of the other departments: the issue of the deposit challenge, in which it is unclear what position the Alderman for housing, heritage, urban and neighbourhood maintenance, green spaces, animal welfare, healthcare and senior care will adopt jeopardises the current solutions the project seeks to implement. The economic aspect at stake, with the local waste sorting agency, balances the social and environmental added value of the project for the Alderman and it is unclear whether the deposit challenge will be validated.
2. (Smart)Public procurement	Low	The design of Public Procurement has not been an issue. The team has managed to write adequate specifications for data treatment and processing as well as for PVs. Some unplanned issues have come up as one of the contracted consortia fell apart and although the PVs have been procured, there is no place for installing them yet. Procurement for the group purchase was also avoided as a direct contract was signed with DeKringwinkel for it to be in charge of the whole process, and therefore of the purchase on behalf of the City of Antwerp. What remains an issue is the end of contract of the organisation in charge of composting units. As the project had not anticipated this, delays have arisen (see below): a specific Procurement needs to be launched to finalise the UIA project. It is hoped that it will be launched and finalised in time for the end of the UIA.

Challenge	Level	Observation
<b>3. Organizational arrangements within the urban authority</b>	<b>High</b>	<p>As mentioned above, the offline activities, especially deposit and green waste challenges are depending upon the activities of other city departments. These two are dependent from the Vice-Mayor on City Maintenance and Housing Policy. Although the issue with the deposit is strictly political, that of the composting units (related to the green waste challenge) was political and became administrative: indeed, with regard to the change of Vice-Mayor during the last elections (in October 2018) it was decided not to launch a new procurement to renew the contract for purchase and maintenance of composting units. The information appeared late in the UIA project, which is now seeking a solution to mitigate it: it would like to sign a contract by itself and is currently negotiating that with the waste department.</p>
<b>4. Participative approach for co-implementation</b>	<b>Medium</b>	<p>Within the existing room for maneuver of such a project that had to be decided upfront, co-creation keeps on being at the heart of the project within the partnership and with the citizens. Synergies are increasing between the City of Antwerp's 'FC Minder Afval' and CIRCUIT's activities.</p> <p>Overall, partners keep their spirit and motivation up as they are finally seeing the concrete results of their work. Yet, two main major issues remain: the end of resources available to some of the project partners, limiting what they could do in addition to what was foreseen originally (e.g. providing some additional adjustments to the app for EnergieID); the stress of (not) achieving the foreseen KPIs (200 residents installing the smart meters at home, 80 members signing up to the Renewable and Citizen Energy Community).</p>

Challenge	Level	Observation
<b>5. Monitoring and evaluation</b>	<b>Low</b>	<p>As indicated in the previous Journals, the indicators for monitoring and evaluating have been thoroughly defined and followed-up. Technical data has been followed-up throughout the whole project: data stream and treatment, app usage and functionalities. Clear indications for energy produced from the PVs are also foreseen (see picture 5). The data on the second waste challenge, “FC Minder Afval”, collected information on the activities of the 660 participants throughout the city (who participated to what and when). The nudging experiment was also thoroughly monitored: in terms of city project, the monitoring has been extremely robust. In terms of actual impact on behaviour shift, it is facing, as shown in section 4.4, the difficulty, if not impossibility to assess such an impact<sup>6</sup>.</p> <p>An evaluation was carried out in March to assess the possibility to reach the 200 households agreeing to be part of the smart meter experiment: it was re-evaluated to 140 households and submitted for approval to UIA (46 household are part of the experiment so far). This figure will be closely monitored and recruitment prolonged to ensure getting as close as possible to this new target. Another evaluation will also be carried out in June to assess whether PVs can be installed and if the number of 80 members for the Renewable and Citizen Energy Community is still realistic to achieve (currently 37 members have signed up).</p> <p>At the same time, the project coordinator is starting to envisage the set-up of a working group to monitor and report in a standardised way in order to ensure a (efficient) consolidated reporting in 2021.</p>

<sup>6</sup> <https://www.uia-initiative.eu/en/news/difficult-transition-consumers-towards-more-sustainable-practices>

Challenge	Level	Observation
<p><b>6. Communication with target beneficiaries</b></p>	<p><b>Medium</b></p>	<p>The project has kept on interacting with its beneficiaries for recruitment and information. It has designed an infographic for the deposit challenge, the waste “FC Minder Afval” campaign has been on social media, as well as during events with the distribution of labelled goodies,... For reasons explained in this and the previous journals, the communication has been widened up outside the Circular South neighbourhood for these waste challenges as well as for the installation of PVs and recruitment for the Renewable and Citizen Energy Community.</p> <p>The team communication officer went on maternity leave, yet she was replaced by a colleague from the Communication team, together with some support from the Circular South team and some extra staff recruitment.</p> <p>At this stage, communication is at its maximum: the project keeps on developing new tools and activities<sup>7</sup>. Notwithstanding its effort, it might need to consider that communication with the objective of recruiting might have reached its possibilities, and that only a very limited number of extra residents will join the project until its end.</p>
<p><b>7. Upscaling</b></p>	<p><b>Low</b></p>	<p>As explained in section 4.5, all the partners are currently envisaging the future of the project. Some will continue it together, developing smart homes and energy group, engaging social target groups and further pursuing the activities of CIRCUIT, others will focus on their individual work or will create new partnership, integrating learnings in new projects.</p>

<sup>7</sup> This journal was written before the upcoming of the covid-19 crisis which has forced the team to look for even more innovative solutions in communicating.

## 5. WHAT ARE THE NEW LEARNINGS OF THE PROJECT?

*“I would love to finish this project with clear insights in the things that triggered the successes of the project and more importantly the failures”* stated Sam Verbelen. Indeed, researching and learning – and exchanging on those – is key in the development, duplication and upscale of such project, and is one of the rationales for such UIA journals to exist. They can lead to one or more follow-up projects. On-going reflexion has been key in this project since its beginning. The previous journals also showed that there is a willingness to learn from issues and improve. Yet, at the time of this 4th Journal, the everyday changing reality of New South, the practical

difficulties of the project and the inherent nature of human beings, residents who just moved to a new neighbourhood face one of the key issues of social innovation: *how do you ensure you get the results you wanted to achieve? To which extent can you control this process? If you cannot, what mitigation measures can you implement?*

The Transition Board will for sure support in the reflections upon these, as well as getting the chance to step back from the daily reality of the project into a wider thematic, methodological and geographical lens.



## 6. WHAT'S NEXT?

The next couple of months will be crucial to the finalisation of the project:

- Procuring and installing PVs, BIPVS and storage batteries;
- Finalisation of the PV-battery lab setup at EnergyVille so that coupling of PV and battery virtualization with real PV and battery can be tested and that on-site work at Nieuw-Zuid is less time consuming;
- The project will benefit from the inputs from the transition board;
- Launching of next nudging experiments;
- Recruitment (smart homes and energy group) and 'customized' communication (What and how do we have to communicate about the energy system?);
- App; Making the user experience for participants as engaging as possible;
- CIRCUIT: move to the final building, Palazzo Verde in October 2020; implementation of managerial determination and balancing of efforts between short- and long-term implying choices and priorities; further work on the Business Model need to be made;
- Renewable and Citizen Energy Community: providing the best possible offer from the perspective of the building owners;
- Organisation of a final conference to disseminate on the project and its results.

In our next journal, to be published Autumn 2020, you will get more details about those!

## 7. ACKNOWLEDGMENTS

This fourth journal was written based on the inputs provided by email exchanges and a site visit on the 5 March 2020 with all the partners:

Maud Coppenrath, project coordinator from the City of Antwerp; Tom Sluyts, Digipolis; Jan Pecinovsky, EnergieID; Jim Williame, Ecopower; Bram Lievens and Carina Veeckman, IMEC; Nik Baerten, Pantopicon; Raf Ponnette, Vito EnergyVille; Hannes Dams and Frank Dingemans, De Kringwinkel Antwerpen; Christine Van derslijen, Innovation Manager Waste & Materials,

city of Antwerp; Sam Verbelen, Innovation Manager Energy & Water, city of Antwerp; Hilde Haex, Innovation Manager Community & Communication, city of Antwerp; Elke Van De Mosselaer, Communication Manager, city of Antwerp, Stéphanie Roels, Circular South Ambassador, city of Antwerp.

I would like to thank all the partners once again for their inputs, reflections and sharing of experiences on the past and prospects of the project.

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



## Urban Innovative Actions

Les Arcuriales  
45D rue de Tournai  
F- 59000 Lille

**+33 (0)3 61 76 59 34**  
info@uia-initiative.eu  
**www.uia-initiative.eu**

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and on **Facebook**.