

CIRCULAR ECONOMY APPROACHES IN SOLID WASTE MANAGEMENT

Study Visit by the Croatian Circular Economy Committee to Amsterdam
3 – 6 July 2022

Summary Report



Executive Summary

This report summarizes the main activities and lessons-learnt from the study visit by the Croatian Circular Economy Committee to the Amsterdam Metropolitan Region, which took place between 3 and 6 July 2022.

The purpose of the visit was to introduce the delegation to key strategies and approaches for managing solid waste and transiting to the circular economy in the Netherlands, in view of collecting best practices which can be transferred to the Croatian context.

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Section 1: Summary of Program

1. Circular Economy Policies in The Netherlands

Contact

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Summary

The Dutch Ministry of Infrastructure and Water Management has set a policy to transition to a Circular Dutch Economy by 2050. The policy lays out three priorities:

- Reduce need for virgin resources
- Substitute fossil-fuels based and non-sustainable products
- Spur innovation through new ways of production and design

The policy started in 2016 with the government-wide policy programme. This was followed by natural resource agreement, an intention agreement to develop transition agendas by product groups/economic sectors. In 2018 transition agendas for 5 economic sectors were developed: biomass and food, plastics, manufacturing industry, construction sector and consumer goods. To execute the plans, an annual implementation plan is developed for the period 2019-2023. A roadmap for circular financing is being developed for the period until 2030.

In addition to introducing the Dutch Circular Economy by 2050 Strategy, Jan-Willem also introduced the national residual household waste program, “From waste to resource programme” or (VANG in Dutch). In the 2022-2025 period, the programme aims to achieve a reduction to 100 kg residual waste from households per person per year and 75% waste separation. In the period 2015-2020, the amount of residual waste decreased from 240 to 180kg per person. In 2020, 60% separated waste collection was achieved (performance is much higher in smaller municipalities and rural areas compared to larger municipalities like Amsterdam and Rotterdam which are lagging behind).

More information

- Dutch Circular Economy Policy: <https://www.government.nl/topics/circular-economy>
- Holland Circular Hotspot: <https://hollandcircularhotspot.nl/>
- Dutch CE showcases of businesses: <https://hollandcircularhotspot.nl/showcases/>
- National Waste Management Plan: <https://rwsenvironment.eu/subjects/from-waste-resources/national-activities/national-waste/>
- Factsheet Waste and Resource Management: <https://rwsenvironment.eu/subjects/from-waste-resources/downloads-waste-and/factsheet-waste/>
- VANG Programme: <https://vang-hha.nl/programma/>

2. Province of North Holland Transition to a Circular Economy

Contact

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Summary



The province of Noord-Holland is one of the signatories of the National Raw Materials Agreement, which followed from the cabinet plan of 2016 Netherlands Circular in 2050. The ambition of the province is in line with those of the national government: Noord-Holland aims to be fully circular by 2050, and for at least 50% of the raw materials to be reused by 2030.

Noord Holland is the first Dutch province with a policy to accelerate the circular transition. The Province started drafting a policy framework in 2017, based on a [scan of opportunities](#) drafted by Circle Economy.

Currently the Province is implementing its [Circular Economy Action Agenda 2021-2025](#) on the basis of learning experience in the previous period ([Circular Economy Action Agenda 2017-2020](#)). The Agenda focusses on the company level and in particular on innovation towards circularity.

In the discussion around the Agenda, the presenters noted that recycling was not considered as the principal component of the strategy, in particular because recycling was regarded as a means to optimize the linear economy rather than transition to a more circular economy. In addition, most recycling in the Netherlands was still downcycling, meaning that material value is reduced rather than maintained.

With respect to the management of household waste, it was mentioned that only 11% of waste in the Netherlands was household waste, but that it was characterized by high costs, including transport costs. An analogy to Croatia was made given that both countries need to deal with waste coming from numerous larger and smaller islands. This comparison could be further exploited in the future.

More information

- Province of North Holland Circular Scan: <https://www.circle-economy.com/news/58-circular-opportunities-for-the-province-of-north-holland-2>
- Overview resources Province of North Holland Circular Economy Programme: https://nota.noord-holland.nl/circulaire_economie/actieagenda-circulaire-economie/
- Circular Economy Action Agenda 2021-2025 Digital Magazine https://www.noord-holland.nl/Onderwerpen/Klimaat_Energie/Circulaire_economie/Een_circulaire_economie

3. Introduction to Amsterdam Economic Board with focus on Circular Economy

Contact

- Claire Teurling, Circular Lead: c.teurlings@amecboard.com

Summary

Amsterdam Economic Board is a network organization tasked with facilitating innovation for the smart, green and healthy metropolitan region, on topics which require collaboration between government, business and knowledge institutions. The Board works on three main themes: sustainable and healthy living environment, valuable work for everyone and responsible use of data and technology.

Claire Teurling introduced the organization, and key initiatives and programs of the Board. The Board's approach is to focus on front-runners and build ecosystems of like-minded people who can inspire and accelerate change. A concrete initiative by the Board was to set up the Green Deal Circular Textiles programme. In this case the Board plays the role of independent network facilitator and orchestrator, bringing together stakeholders which are not used to working together.

Network governance, in which stakeholders jointly realize the desired objectives, was considered crucial when it concerns systems change – as is the case with circular initiatives. Such changes are complex and need goal-oriented network governance to be effective. According to the Amsterdam Economic Board's experience, network governance needs to be based on 10 guiding principles supporting three different phases of building a circular economy (see table 1 below).

Table 1: Ten Guiding Principles for Building a Circular Economy

Phase 1: Sparking the Transition	
1	The transition starts with a shared sense of urgency. No actor can realize a circular initiative alone
2	The implementation occurs in four subsequent, but cyclic phases (preparing, building, scaling and mainstreaming)
3	The tasks to be performed for each circular initiative are roughly the same, but case specific
4	Building a circular economy is a journey with a clear destination, but without a predetermined path
Phase 2: Setting the context for transformative change	
5	Focus on the most promising and far-reaching innovations. Select front-runners in industry as lead
6	Map the key drivers and preconditions for successful implementation at the start
7	Identify the relevant actors and assess their willingness to join forces at the start
Phase 3: Successful implementation	
8	Develop new circular business models that benefit the consortium partners
9	Orchestration through intermediaries ("transition brokers") can accelerate circular initiatives
10	Build a consortium of relevant network partners and agree upon a transparent division of labour

Source: Cramer, J. (2022), *Building a Circular Future – Ten Takeaways for Global Changemakers*, Amsterdam Economic Board, Amsterdam.

A key challenge emerging from discussion with various Dutch stakeholders and experts is related to measuring and evaluating progress in implementing the circular economy. In this

respect, the City of Amsterdam has made some progress by development the [Circular Economy Monitor](#). The city is interested to learn from other cities/organizations which are measuring circularity in order to evolve its methodology.

More information

- Green Deals Circular Textiles: <https://amsterdameconomicboard.com/nieuws/green-deals-circular-textile-signed/>
- Books: “Building a Circular Future” & “How Network Governance Powers the Circular Economy”: <https://amsterdameconomicboard.com/en/news/building-a-circular-future/>

4. Introduction to AMS Institute Circular Economy Program

Contact

- Joke Dufourmont, Programme Developer Circularity in Urban Regions: joke.dufourmont@ams-institute.org

Summary

AMS Institute was founded in 2014 by three core academic partners: Delft University of Technology (TU Delft), Wageningen University & Research (WUR) and Massachusetts Institute of Technology (MIT). Despite the academic partners, the agenda of the institute is not driven by academia but by real life urban challenges. AMS Institute is tasked with supporting the city of Amsterdam’s goals for becoming a more sustainable, resilient and just city, for current and future generations. AMS Institute plays a vital role in research and innovation, education and entrepreneurship. Key to the AMS’ approach is to use the Amsterdam Metropolitan Area (AMA) as a living lab, providing a setting for multiple stakeholders to jointly create, develop, and test solutions for real-life issues.

The presentation and discussion by Joke Dufourmont focused on the Institute’s portfolio of projects on circular economy topics, including the circular retrofitting of social housing, mapping the urban mine, and biobased construction.

On infrastructure, the institute follows a “10% approach”, meaning that as an intermediary goal 10% of urban assets should be maintained according to circularity principles, with particular focus on the walls along Amsterdam’s canals, its bridges and the pavement. Information was considered as an essential missing piece for circular maintenance of Amsterdam’s infrastructure. For example, better knowledge about status of the sewerage system and glassfibre expansion plans could reduce the need for construction sites in the city by maintaining sewerage and laying new glassfibre cables at the same time.

More information

- AMS Circularity in Urban Regions: <https://www.ams-institute.org/urban-challenges/circularity-urban-regions/>
- Building in timber: <https://www.ams-institute.org/news/timber-construction-bad-environment-and-forests-fact-or-fiction/>

5. Tour of De Ceuvel and introduction to Metabolic's Circular Cities Program

Contact

- Guillermo Dekker, Circular Cities Lead: guillermodekker@metabolic.nl

Summary

De Ceuvel is a former shipbuilding yard which been converted in a circular “living lab” in response to an open tender by the City of Amsterdam for a temporary, 10-year lease of the site. Former house boats have been upcycled into affordable working spaces for creatives. Many circular and decentralized solutions have been implemented in a low-cost “Do-it-yourself” way. This location has become a key hub for circular innovations in Amsterdam, with many professionals and organizations visiting the area to experience what the circular economy can look like in practice.



De Ceuvel has also inspired the development of the Circular Buiksloterham Manifesto which set the ambition to development the district of Buiksloterham according to circularity principles. Circular area development is a priority for the city of Amsterdam because past research has indicated that area development (construction and demolition) contributes to ~60% waste generated in the city.

De Ceuvel represents one of the earliest examples of projects implemented by Metabolic in Amsterdam. Guillermo introduced several other examples of how they work with cities and organizations to map out urban metabolism flows and create plans and programs for implementing the circular economy.

More information

- De Ceuvel: <https://deceuvel.nl/en/>
- Spatial analysis of Amsterdam as a circular metabolism: <https://www.metabolic.nl/projects/circular-amsterdam-spatial-implications/>
- Circular Rotterdam: New jobs in a zero waste economy: <https://www.metabolic.nl/projects/circular-rotterdam/>
- Circular cities Poland: <https://www.metabolic.nl/projects/circular-cities-program-poland/>
- Pioneering towards a circular economy and zero waste city of Boulder: <https://www.metabolic.nl/projects/circular-boulder-pioneering-steps-towards-a-zero-waste-and-climate-neutral-city/>

6. Tour of Circular Buiksloterham

Contact

- Frank Alsema, Circular Buiksloterham Pioneer: frank@urbanlabs.nl

Summary

Frank Alsema, urban pioneer in Buiksloterham, led the group on a tour explaining how the ideas of circularity are being implemented in the development of a new district. Buiksloterham, which was previously home to some of Amsterdam's most polluting industries has emerged as one of the city's leading living labs for circularity. Residents, companies, knowledge institutions and the municipality of Amsterdam are working together to achieve the shared principles signed in the "Circular Buiksloterham Manifesto", including:

- New construction is easy to adapt and disassemble.
- Reuse of raw materials and materials as much as possible.
- Circular construction is a condition for land issuance.
- Generate sustainable energy in the neighborhood itself.
- Provide greenery that contributes to biodiversity and coolness.
- Residents and companies separate their waste.



Highlights from the tour include Schoonschip, a floating eco-village built to a high standard of circularity and sustainability, and Palais Recup, a home-work house built out of waste materials collected from 'unfinished' or obsolete buildings from all over the Netherlands.

More information

- Circular Buiksloterham Manifesto: <https://www.metabolic.nl/projects/circular-buiksloterham/>
- City of Amsterdam Buiksloterham page: <https://www.amsterdam.nl/projecten/buiksloterham/circular/>

- Designing post-industrial Amsterdam: The case of Buiksloterham: https://www.metabolic.nl/wp-content/uploads/2019/02/CircularCities_designing-post-industrial-Amsterdam_final_web-sm.pdf
- Schoonschip: <https://greenprint.schoonschipamsterdam.org/>
- Palais Recup: <https://www.palaisrecup.nl/en/>

7. Almere Upcycle Center

Contact

- Hede Razoky, Accountmanager Upcyclecentrum: hrazoky@almere.nl

Summary

Almere is a municipality of ~218,000 inhabitants in the Amsterdam Metropolitan Region, which has the ambition to become a circular and sustainable city. The city is responsible for waste collection in the city, utilizing waste bins and (underground) containers. The city also offers three recycling stations where residents can discard of their waste free of charge. The newest and most innovative of these recycling stations is the Almere Upcycle Centre which was completed in January 2018. It is thus part of the municipality and is financed from waste taxes. It currently works on a not-for-profit basis.



The building itself is made of reused materials and has been built in a modular fashion (i.e. easy to dismantle and to reuse components). The innovative upcycling aspect of the centre is that it houses three entrepreneurs, which are offered space and favorable conditions to create new products from the waste flows. While most of the waste delivered to the center is recycled, certain waste streams are particularly suitable for upcycling by the entrepreneurs, including metals, wood and textiles. These are separated for upcycling. The group visited two entrepreneurs on the site, including a jewelry maker and a carpenter, both of which claimed to work on a profitable basis.

Additionally, the Upcycle Center also serves as an education center, where professionals, students and local residents can acquire knowledge of and be inspired by the upcycling of materials. Entrepreneurs have to dedicate 10 hours per week for such educational purposes.

A key obstacle for increasing upcycling was considered to be existing laws and regulations. Waste from the center can only be upcycled in the center itself and cannot be given to upcyclers outside of the center, simply because it is classified as waste. A key precondition for mainstreaming upcycling and to increase profitability of upcycling was considered the establishment of a market place for waste (to increase availability of suitable waste), as well as storage sites.



One of the main points of discussion during the visit to the Almere Upcycle Center was related to the financing of waste collection and management in the Netherlands. Dutch municipalities are tasked with managing household waste and to do so they applying a “waste collection levy” (“afvalstoffenheffing” in Dutch). This tax has to be paid by every household and the amount usually depends on whether one or more people live at the residence. This tax is collected by the municipalities. More information on how waste collection is financed in the Netherlands can be found in the following reports:

- BPL Options for Waste Tax Policy Study: https://www.pbl.nl/sites/default/files/downloads/PBL_2014_Opties-voor-een-afvalstoffenbelasting_1406_1.pdf
- Waste prevention strategies of municipalities in the Netherlands: A policy instrument analysis: https://theses.uibn.ru.nl/bitstream/handle/123456789/11346/Linden_van_der_%2C_Marise_1.pdf?sequence=1

More information

- Waste & recycling in Almere: <https://english.almere.nl/living-and-working/waste-and-recycling>
- Almere – Upcycle Centre: <https://circularestad.nl/en/projects/almere/almere-upcycle-centrum-english/>

8. Plastic Recycling Amsterdam

Contact

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- Floris Wyers, Project Development: floris.wyers@umincorp.com

Summary

Plastic Recycling Amsterdam (PRA) factory is a new factory opened by Umincorp in Amsterdam’s Industrial harbor in 2018 to process and recycle plastic recovered from household waste in the cities (and regions) of Amsterdam, Rotterdam, Utrecht and The Hague. The facility uses Magnetic Density Separation (MDS) technology to separate mixed plastic waste.

The process operated by Umincorp is different to conventional plastic sorting. The mixed plastic waste received is first washed and ground into smaller particles. This loosens up the different types of plastic. The mix of different types of plastic are then separated into 5 different types of plastic, by the above-mentioned MDS technology in one step. These types have a purity of up to > 99%. The quality of the end result is a close match to new plastic and is therefore reusable for new products.

The technology was presented as a good alternative to source collection/separation and was able to separate as much plastics in three months as humans can within an entire year (example for Rotterdam). The profitability of the plant increases with the oil price because sorted polymers can be sold at a higher price (while at the same time virgin materials become more expensive). Its applicability in Croatia depends on the number of people served and the amount of waste sorted, but it was proposed that the technology could be used in the cleaning out of existing landfills.

More information

- Pre- sorting line at AEB (residual waste sorting before incineration) in Amsterdam and the Umincorp plant: <https://www.youtube.com/watch?v=5eTewU1Zsec>
- Umincorp process explained: https://www.youtube.com/watch?v=2c4a4Pi_jMQ
- Umincorp technology (from tray to tray): <https://www.youtube.com/watch?v=X1qMLfMZzVg>
- Umincorp: <https://umincorp.com>
- Plastic Recycling Amsterdam: <https://www.plasticrecyclingamsterdam.nl/en/>

9. Waste Transformers

Contact

- Coen Bakker, Marketing Manager: coen.bakker@thewastetransformers.com
- Martin Rohleder, Sales Director: martin.rohleder@thewastetransformers.com

Summary

Food waste is a major contributor to greenhouse gas emissions. This is not only true for the waste itself but also for transportation requirements rated to its collection and treatment. The Waste Transformers presented a scalable solution based on modular anaerobic digesters, which can be placed in the form of shipping containers at locations where food waste is produced.

The food waste is collected, shredded and pumped into the closed system. The output is biogas and fertilizer. Biogas can then be burnt to generate electricity and heat (which can also be turned into cooling). Additional to the



benefits of managing organic waste locally, the Waste Transformers can support organizations and communities with their renewable energy goals, while also recovering valuable nutrients from the food waste for use in local food production. The digesters also help to reduce greenhouse gas emissions by replacing artificial fertilizer, reducing transport requirements for food waste and diverting food waste from landfills.

A business case has been presented for the Maldives, which has many parallels with the Croatian situation (many islands with high dependence on tourism sector). The company offered to provide more information about the feasibility and profitability of the digesters in specific

settings (e.g. in Croatia) based on a short questionnaire about the potential site, amount of daily waste produced (250-3000kg), content of waste (contaminations), and reason for implementing this kind of small-scale, modular and mobile technology.

More information

- The Waste Transformers: <https://www.thewastetransformers.com/>

10. Afval Energie Bedrijf (AEB or Waste Energy Company)

Contact

- Peter van der Meij, Manager Customer Service: Peter.vanderMeij@aebamsterdam.nl

Summary

Afval Energie Bedrijf (AEB or “Waste Energy Company” in English) one of the largest waste processing plants in Western Europe and since 2022 belongs to Chinese-owned AVR Rotterdam. It treats some 1.4 million tons of waste per year and employs around 300 people. Most of the waste treated is commercial waste (over 1 million tons), which goes directly into the incinerator (without prior separation) for energy and heat production. The resulting ash is reused for the construction of roads and bridges, while parts are also landfilled.



AEB receives some 300,000 tons of household waste per year from the Amsterdam Region. Approximately 15% of this household waste is recovered through a materials recovery facility (MRF) which separates plastics, paper, metal and 6 other waste streams. The costs of sorting amount to around €50 per ton of household waste. The remaining 85% (some 255,000 tons) of household waste is incinerated for energy and heat production.

During the visit to AEB a discussion emerged on the benefits of separation at the source (i.e. at household level) or at the facility. In the case of Amsterdam, residents are asked to separate paper, glass, and textile at the source. In a few neighborhoods, residents are also provided with separate bins for organic waste. All other waste is currently disposed of as “residual waste”. This residual waste is processed through the AEB Separation Plant which recovers plastics and a few other streams, which are then sent off to other facilities for further separation (e.g. to Plastic Recycling Amsterdam, see above). In the Netherlands, Amsterdam has one of the lowest rates of household waste separation/recovery, especially for organic waste. The explanation often offered is that for people living in mid/high-rise buildings which are common in Amsterdam, it is difficult to separate waste.

More information

- AEB homepage: <https://www.aebamsterdam.com/>
- AEB sale to AVR: <https://www.aebamsterdam.com/news/municipality-of-amsterdam-announces-sale-of-aeb-to-avr-afvalverwerking/>

11. Circl Pavilion

Contact

- Hans Hammink, Architect, Associate & Circularity Lead H.Hammink@cie.nl
- Pero Puljiz, Architect & Partner: P.Puljiz@cie.nl

Summary

Circl is a pavilion in Amsterdam's Zuidas business district built by Cie Architects for ABN AMRO bank. The tour was led by the lead architect, Mr Hans Hammink, who said that it was the first building in Amsterdam designed and constructed according to sustainable and circular principles. As such, he could not draw from the experience of other projects but needed to make a significant learning experience together with architects, client and suppliers. Circl has been created to be energy efficient and easy to disassemble, to make as little impact as possible on the planet. Many of the things used to build Circl have already had a previous life. Other raw materials – from the wood used in its construction to the aluminum on its outer walls – can be reused in the future.



While the client was open to new ideas, a major difficulty was that the supply industry was unable to supply circular versions of the required products, which the architects needed to source by themselves.

According to the architect, the building should not be understood as something to replicate one to one, but rather as a collection of different examples of how buildings can become more circular. Main examples of circularity embedded in the design and construction include:



- Reuse of existing materials as much as possible: windows recovered from a demolition project have been reused in the construction.
- The timber support structure is made from fully dismantlable locally sourced Larch wood.
- Old jeans of employees of the bank have been collected and turned into insulating material.
- The lifts in Circl have not been purchased, but have been leased and can be returned to Mitsubishi (the manufacturer) after ten years.
- All materials, components and parts that make up the building have been recorded in a “digital twin”, or material passport, to be used to identify and optimally reuse materials in the future.

In addition, Circl is a living lab - a place where people meet and exchange ideas about sustainability and circularity. The food served in the restaurants is local and circular.

The architects wrote a book about their experience with working on a circular building and offer ten tips that can help towards creating circular buildings (see Table 2).

Table 2: Ten Tips That Can Help Towards Creating a Circular Building

Tip 1	Know what materials, including reusable materials, and products are available, and where
Tip 2	Think in small steps. A 100% circular building does not exist, every step counts!
Tip 3	Know the expected service life of circular products and ensure easy dismantling
Tip 4	Understand the circular revenue models such as the residual values of buildings
Tip 5	Ensure that your knowledge of construction systems, products, and materials is up to date
Tip 6	Make a flexible and multifunctional design
Tip 7	Provide high-quality architecture that users will love
Tip 8	Have a good story to tell which fits the client's vision
Tip 9	Understand that the final picture is only known upon completion, e.g. due to the fact that you don't know which used materials and products will be available
Tip 10	Be aware that circular design leads to a different aesthetic – but not inferior quality

Source: Adapted from de Architekten Cie. (2021), *Lessons in Circularity*, Amsterdam.

More information

- Circl Pavilion: <https://cie.nl/circl?lang=en>
- eBook “Lessons in Circularity” <https://cie.nl/ebook-circularity?lang=en>

Section 2: Reflections & Discussion with Croatian Participants

One participant mentioned that he previously thought about the circular economy as something vague and not tangible, but that the study trip helped him realize for the first time that change was actually possible.

Several participants agreed that the circumstances in Amsterdam and Croatia were not comparable and that it was difficult to see how Dutch examples could be implemented in Croatia. Yet, the study trip visits could help in designing pragmatic solutions tailored to Croatian circumstances, that could actually be implemented.

An important starting point was better collaboration between Croatian stakeholders (and members of the CEC) as collaboration was a key element for accelerating circularity in The Netherlands. In addition, communication about circular solutions/benefits to business and citizens was considered important to promote a more sustainable development in Croatia. This was also necessary in view of the reportedly low level of environmental education, information, and awareness of Croatian consumers.

The question about the economic benefits of the circular economy was raised, but several examples shown during the study trip proved that there are economic arguments in favor of the transition. In particular, the study trip helped participants to understand the benefits of upcycling, where waste is used as a resource for new products, including buildings (CIRCL) and jewelry (Almere Upcycling Centre).

As potential next steps back home in Croatia, participants focused on better collaboration and communication, including in the context of the CEC, while a representative from academia very concretely suggested to include circular economy principles in his programs/lectures.

Section 3: Additional Resources

1. VANG: Dutch Waste-to-Resource Programme

VANG, which stands for “Van Afval Naar Grondstof” (or From Waste to Resource) programme, is the Dutch Ministry of Infrastructure and the Environment’s programme supporting the transition to a circular economy. First initiated in 2013, the programme has produced several implementation programmes, such as the VANG for Household Waste programme, the More and Better Recycling programme, and the VANG Outside the Home programme. The VANG programme’s primary objectives are to introduce more sustainable products onto the market, promote more sustainable consumption, and get people to recycle more and better to ultimately achieve a circular economy. A key ambition is to reduce the amount of residual waste to 100 kgs per inhabitant per year and/or achieve an average of 75% separation of household waste.

More information

- VANG Programme: <https://vang-hha.nl/>
- VANG Knowledge Library (300 papers & reports, primarily in Dutch): <https://vang-hha.nl/kennisbibliotheek/>

2. Amsterdam Waste and Raw Materials Implementation Programme 2020 – 2025

The city of Amsterdam Waste and Raw Materials Implementation Programme lays out an approach for transitioning to a circular economy by conserving and increasing the recovery of raw materials. Every citizen of Amsterdam produces on average 358 kgs of waste per year (based on 2019 data). Via a two-separation approach (at the source and at the facility), approximately 111 kg (31%) of materials from residual waste are recovered, leaving 247 kg (69%) of residual waste per person per year that is currently incinerated for electricity and heat production.

Of the 247 kg per person currently not recovered, the municipality evaluates that approximately half (173 kg) can be better separated either at the source or at the facility. A main priority of Amsterdam’s waste and raw materials programme for 2020-2025 is to increase the rates of separation and recovery.

City of Amsterdam Separation Approach

- **Continued separation of paper, glass, textiles:** Amsterdam continues to separate paper, glass and textiles via (underground) containers across the city. The city also operates seven “[Waste Points](#)” where residents can dispose of their (bulky) waste.
- **More separate collection of organic waste:** In a few neighborhoods residents also separate organic waste and food scraps. This separate collection will be further rolled out based on a neighborhood-by-neighborhood approach. The city also supports neighborhood initiatives for recycling of organic waste such as neighborhood composting and “[worm hotels](#)”. Organic waste separation is in part driven by European legislation.
- **Stop plastic separation at the source:** From 2021 the city has stopped with plastic separately. Mechanical plastic separation in the factory, so-called post-separation, now works just as well (or better). Plastic, drinking and dairy cartons and cans from the waste are recovered via the AEB separation plant. Plastic is therefore disposed of in the residual waste.

More information:

- Waste and raw materials implementation programme 2020-2025:
<https://www.amsterdam.nl/afval-en-hergebruik/uitvoeringsprogramma-afval/>

City of Amsterdam Circular Innovation Strategies & Key Initiatives

- [Circle Economy Circle City Scan](#): starting point for City of Amsterdam's circular innovation programme which in 2016 identified the areas where the most significant and tangible progress can be made in realizing a circular economy.
- [Circular Innovation Programme 2016-2018](#): first innovation program to accelerate the transition towards a circular economy. Focus on circular knowledge development, circular procurement, learning by doing through innovation pilots, identifying restrictive laws and regulations that are possibly obstructing circular innovation projects in the city.
- [Circular Strategy 2020-2025](#): aims to halve the use of new raw materials by 2030 and to achieve a fully circular city by 2050. Focus on 3 value chains: 1. Built environment, 2. Food and organic waste streams and 3. Consumer goods.
- [Amsterdam City Doughnut](#): city 'self-portrait' as tool for meeting circular ambitions by looking at four interconnect perspective: social, ecological, local and global.
- [Circular Economy Monitor](#): launched in February 2022; methodology shared openly with other cities/stakeholders
- [Amsterdam Donut Coalition](#): an open network of people established in December 2019 to make visible and connect projects, initiatives and people working on donut economy/circularity topics and help put them into practice.

Annex 1: Final Program

Monday, 4 July 2022					
Time	Organisation	Location	What	Who	Comments / Notes
8:30 – 9:00	Direct VIP Service	Pick up from Hotel Casa Amsterdam	Transfer to Amsterdam Smart City Office	Lodewijk Hulsman, Direct VIP Service	-
8:50 – 9:00	Amsterdam Smart City / Amsterdam Economic Board	Amsterdam Smart City office Kattenburgerstraat 5, Building 002A	Arrival on Marineterrein	Host: Cornelia Dinca, International Liaison, Amsterdam Smart City	-
9:00 – 11:30	Amsterdam Smart City / Amsterdam Economic Board	Amsterdam Smart City	Introductory roundtable on key circular economy strategies and policies on waste management and circular economy topics.	Presentations and discussion with: <ul style="list-style-type: none"> • Dutch Circular Economy Strategy by 2050 by Jan-Willem Oosterbroek, Senior Policy Advisor, Ministry of Infrastructure & Water Management • Circular Economy Policies by Province of North Holland by Suzanne van den Noort, Circular Economy Program Manager & Franck Kuiper, Strategic Policy Advisor Circular Economy at Province of North Holland • Transition to the Circular Economy in Amsterdam Metropolitan Region by Claire Teurlings, Circular Economy Lead at Amsterdam Economic Board 	-
11:30 – 12:30	AMS Institute	AMS Insitute	Introduction to AMS Institute circularity in urban regions program	Joke Dufourmont, Programme Developer Circularity in Urban Regions	-
12:30 – 14:00	Lunch	-	Lunch break	-	-
14:00 – 14:30	Transfer to Buiksloterham	-	Travel time	Lodewijk Hulsman, Direct VIP Service	-

14:30 – 17:00	Tour of De Ceuvel	De Ceuel	Tour of De Ceuvel and Introduction to Metabolic Cities Program	Guillermo Dekker, Circular Cities Lead, Metabolic	
14:30 – 17:00	Walking tour of Buiksloterham	-	Walking tour of Circular Buiksloterham	Frank Alsema, Palais Recoup & Buiksloterham Lab	-
17:00 – 18:00	Program wrap-up / debrief	Pilek Restaurant	De-brief	Cornelia Dinca	-

Tuesday, 5 July 2022

Time	Organisation	Location	What	Who	Comments / Notes
8:45 – 9:30	Pick-up from hotel and transfer to Almere Upcycle Center	-	Travel time	Lodewijk Hulsman, Direct VIP Service	-
9:30 – 11:30	Almere Upcycle Center	Almere Upcycle Center De Steiger 113, 1351 AK Almere	Presentation and tour of Almere Upcycle Center	Hede Razoky, Account Manager Upcycle Center at City of Almere	-
11:30 – 13:00	Transfer to Amsterdam & Lunch	Market33	Travel time & Lunch	Lodewijk Hulsman, Direct VIP Service	
13:00 – 13:30	Transfer to Port of Amsterdam	-	Travel time	-	-
13:30- 15:30	Plastic Recycling Amsterdam	Amerikahavenweg 42, 1045 AG Amsterdam	Presentation about plastic management in Amsterdam Region	Jelle Sernee, Co-founder & Partner of Umincorp Floris Wyers, Project Development, Umincorp	-
15:30 – 16:00	Transfer to Prodock		Travel time	Lodewijk Hulsman, Direct VIP Service	-

16:00 – 17:00	The Waste Transformers	Moezelhavenweg 9, 1043 AM Amsterdam	Presentation and discussion about organic waste management in Amsterdam Region / the Netherlands	Coen Bakker, Marketing Manager, The Waste Transformers Martin Rohleder, Sales Director, The Waste Transformers	-
17:00 – 17:30	Transfer to Hotel & program end	-	-	Lodewijk Hulsman, Direct VIP Service	-

Wednesday, 6 July 2022

Time	Organisation	Location	What	Who	Comments / Notes
8:30 – 9:00	Pick-up from hotel and transfer to AEB	-	Travel Time	Lodewijk Hulsman, Direct VIP Service	
9:00 – 12:00	Afvall Energie Bedrijf (AEB or “Waste Energy Company” in English)	Australiehavenweg 21, 1045 BA Amsterdam	Introduction to AEB facilities and tour of Separation Plan	Peter van der Meij, Manager Customer Service, AEB Amsterdam	Participants are required to register using passport in order to access AEB facilities.
12:00 – 12:30	Transfer to CIRCL Pavilion	-	Travel time	Lodewijk Hulsman, Direct VIP Service	-
12:30 – 14:00	Lunch	CIRCL Pavilion	Lunch break	-	-
14:00 – 15:30	Tour of CIRCL Pavilion	CIRCL Pavilion	Tour and discussion with architect of CIRCL pavilion	Hans Hammink, Architect & Associate, Architekten Cie Pero Puljiz, Architect & Partner, Architekten Cie	-
15:30 – 16:00	Final visit debrief & program end	CIRCL Pavilion	Final debrief / reflections	Cornelia Dinca	-
16:00 – 17:00	Transfer to Airport	-	Travel time	Lodewijk Hulsman, Direct VIP Service	-