



Mission-oriented R&I policies: In-depth case studies

Circular Economy Flanders (Belgium)

Andreas Tuerk, Neil Bird
February 2018 February 2018

*Research and
Innovation*

Case Study Report: Circular Economy Flanders (Belgium)

European Commission
Directorate-General for Research and Innovation
Directorate A — Policy Development and Coordination
Unit A.6 — Open Data Policy and Science Cloud
Contact Johan Stierna
E-mail johan.stierna@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
European Commission
B-1049 Brussels

Manuscript completed in February 2018.

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More information on the European Union is available on the internet (<http://europa.eu>).

Luxembourg: Publications Office of the European Union, 201.

PDF

ISBN 978-92-79-80158-7

doi: 10.2777/8484

KI-01-18-149-EN-N

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EUROPEAN COMMISSION

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Case Study Report

Circular Economy Flanders (Belgium)

Andreas Tuerk

Neil Bird



A Study coordinated by the Joint Institute for Innovation Policy

Table of Contents

1	Summary of the case study	1
2	Context and objectives of the initiative	2
2.1	Contextual factors and origins of initiative.....	2
2.2	Strategic and operative objectives and milestones of the initiative	5
3	Resources and management.....	9
3.1	Financing model.....	9
3.2	Key actors involved in the initiative	10
3.3	Level and type of citizen engagement in the initiative	10
4	Policy instruments and wider policy-mix used for implementing the initiative.....	11
4.1	Description of the R&I policy instruments used for implementing of the initiative	11
4.2	Connections with other policies.....	11
4.3	Key turning points of the initiative and policy adaptation measures.	11
5	Realised or expected outputs, outcomes and impacts	11
5.1	Outputs, Outcomes and new instruments	11
5.2	Impacts	12
5.3	Summary of the key indicators.	12
6	Conclusions and lessons learned	14
6.1	Identification and assessment of key strengths and weaknesses of the initiative	14
6.2	Lessons learned and key messages for European R&I policy	14
	References	15

1 Summary of the case study

Summary fiche	
Title:	Circular Flanders, Belgium/ Vlaanderen Circulair
Country:	Belgium
Thematic area:	Climate Change
Objective(s):	Transition to a circular economy
Main governing body:	OVAM, the Public Waste Agency of Flanders
Timeline:	2012-2020
Budget:	From 2012 to 2015 OVAM and its strategic partners invested EUR 5.5 million in Flanders Material Programme projects: EUR 3.6 million on personnel and EUR 1.9 million on undertaking applied policy research, developing unique tools and communicating the circular economy. In addition, there is EUR 6 million in circular innovation/entrepreneurship subsidies (Flanders Innovation and Entrepreneurship) and EUR 30 million in investment capital (Flanders Environmental Holding).
Brief description of the case (250 words)	<p>The centrepiece of the Vlaanderen Circulair initiative is the Flemish Materials Programme. It consists of Plan C, the Sustainable Materials Management (SuMMa) and the Agenda 2020. The non-profit organisation Plan C, established in 2012, has three core activities: vision development, the formation of a learning network, and the establishment and support of specific innovative projects. The Sustainable Materials Management (SuMMa) policy research centre, also established in 2012, supports evidence-based policy in this exceptionally multi-departmental domain. The work of Plan C and SuMMa has also been supplemented by an action plan, Agenda 2020, for short-term initiatives operated by OVAM (Agenda 2020).</p> <p>The circular economy in Flanders is embedded in a broader societal vision for Flanders, Vision 2050, adopted in 2016, that aims a social, open, resilient and international Flanders that creates prosperity and well-being in a smart, innovative and sustainable way, in which every individual counts. The Vision 2050 takes a broader approach of the circular economy where transversality is more featured. The transition priority "circular economy" is in the joint responsibility of the Ministry of Environment and the Ministry for Economy and Innovation; more emphasis is put on collaboration across industries and with stakeholders than in the past; the scope of ambition of Vlaanderen Circulair has been broadened to reach out to a significant number of stakeholders who were previously not or insufficiently involved compared to the Flemish Materials Programme that exist already since 2006. The scope has been broadened to include materials, energy, water and food.</p>
Implementation and organisation (a brief description of the governance and policy instruments used)	The basis of Circular Flanders is the Flemish Materials Programme operated by the Public Waste Agency of Flanders, OVAM. Circular Flanders also consists of the non-profit organisation Plan C, the Sustainable Materials Management policy research centre (SuMMa) and the Agenda 2020. PlanC and SuMMa were merged in 2017 with the Flemish Materials Programme in a process establishing Circular Flanders. Plan C includes a network of frontrunners and creates a long-term vision and experiments with new business models, while the Agenda 2020 enables concrete priority multi-stakeholder actions streamlining actors and initiatives.
Observed / expected outputs, outcomes, and impacts	The outputs and outcomes of the initiative are difficult to quantify as no overall targets have been set so far, and no comprehensive indicators to monitor the initiative exist. For Flanders, estimates show that investing in a circular economy could cut materials expenses by 2% to 3.5% of GDP, and could create 27 000 new jobs, ranging from high-tech positions to low-training positions.

Assessment of the main elements of mission-oriented R&I initiative ¹	
Directionality (links to societal challenges, industry transformation):	Yes , strong links via the Vision 2050
Intentionality (specific, well-articulated goals):	No , Rather unspecific goals
Clearly set timeline and milestones:	No , the timeline and milestone are vague
Mobilises public and private investments:	To a certain degree. The focus is still on harnessing currently available subsidy programmes rather than on generating new ones.
Focused on new knowledge creation (basic research, TRLs 1-4):	Some activities include TRLs 4-9
Focused on knowledge application (applied research, TRLs 5-9):	Yes
Demand articulation (involves instruments for inducing demand):	To a certain degree
Multi-disciplinary (inter-disciplinary and/or trans-disciplinary):	Yes , in particular by involving leading Flemish research institutions
Joint coordination (multi-level and/or horizontal governance of policies/finance):	To a certain degree , the different organisations within Circular Flanders target different stakeholders and levels of governance.
Reflexivity (flexible policy design, timely monitoring):	To a certain degree , the policies are not very specific and not binding, but rather frameworks and incentives. There is so far no comprehensive monitoring of the policy outcomes.
Openness (connected to international agenda and networks):	To a certain degree , Circular Flanders is engaged and visible internationally. In 2016 for example it won the Circular Economy Award at the World Economic Forum. However, the initiative is not formally involved in international networks.
Involvement of citizens:	Yes , via involving municipalities, or addressing citizens directly via workshops or online tools

2 Context and objectives of the initiative

2.1 Contextual factors and origins of initiative

Origins

Flanders is highly dependent on international sources for its raw materials. Raw materials constitute the foundations of Flanders social welfare, but their availability is not

¹ Assessment: Yes, To certain degree, No or Not known.

guaranteed². Flanders imports the greater part of its natural raw resources from abroad. Its own primary industrial raw materials are limited to sand (including quartz sand), shingle, clay and loam³. Wallonia also mines and exploits carbonate rocks (lime and dolomite) used, for example, in the production of cement, increasing the pH of soil for agriculture, and as flux in the steel industry. While these raw materials are present in abundance, environmental effects (e.g. CO₂ emissions during the production of cement) and local planning issues (including 'not in my backyard' or NIMBY-reactions) exercise an ever-increasing influence on the extraction of these materials. As a result, almost no new mining sites have been approved in recent years⁴. Local supplies of sand for construction, for example, have grown increasingly scarce and increasing amounts must be imported. In the first half of the last century, Belgium was a leading player in the extraction and processing of ores. From the middle of the last century, the accent shifted almost completely to processing and more recently to metal recycling. It is in this latter sector that economic activity within the Circular Economy (CE) is important and will become even more so. Flanders has a strong position and a competitive edge as world leader in the exploitation of the 'urban mine', with companies such as Umicore, Metallo Chimique, Nyrstar, Campine, Van Gansewinkel, Suez, Galloo.⁵

Flanders has set the tone in the past in the European debate surrounding sustainable materials management. The European environment minister's summit in 2010 under Belgian chairmanship, for example, was convened by the Flemish environment minister Joke Schauvliege (in office 2009-2014). CE is included as a goal of the present Flemish political coalition agreement. The point of departure here, however, is still focused on waste management⁶.

From the Flemish Materials Programme (Vlaams Materialenprogramma – VMP) to Vlaanderen Circulair

In 2012, the non-profit organisation Plan C was established (an initiative that was initially established by OVAM, the Public Waste Agency of Flanders, in 2006) with a mission to expedite pioneering advances in sustainable materials management. Plan C has three core activities:

- Vision development;
- Formation of a learning network; and
- Establishment and support of specific innovative projects.

Plan C has instigated several CE initiatives as an independent networker between government, companies, NGOs and the academic world.

Also in 2012, the Sustainable Materials Management (SuMMa) policy research centre was established to support evidence-based policy in this exceptionally multi-departmental domain. SuMMa is an interdisciplinary consortium of KU Leuven, Ghent University, VITO, HUB, UHasselt and Universiteit Antwerpen.

The work of Plan C and SuMMa has also been supplemented by an action plan for short term initiatives operated by OVAM (Agenda 2020). These three initiatives are highly complementary and together, since 2017, they make up Vlaanderen Circulair, with an even stronger focus on an integrated approach to a circular future. Plan C and the management of SuMMa were integrated into OVAM in 2017.

² https://www.kuleuven.be/metaforum/docs/pdf/wg_52_e.pdf

³ *ibid*

⁴ *Ibid*

⁵ https://www.kuleuven.be/metaforum/docs/pdf/wg_52_e.pdf

⁶ *Ibid*

Vision 2050

The circular economy in Flanders is embedded in a broader societal vision for the region. The Government of Flanders presented its future 'Vision 2050' in 2016, namely a social, open, resilient and international region that creates prosperity and well-being in a smart, innovative and sustainable way, and one in which every individual counts⁷.

'Vision 2050' sketches a long-term policy vision across all Flemish competences (environment, culture, transport, etc.), in order to provide an answer to new opportunities and challenges, and to put into gear the sought-after transitions in the Flemish society.

To reinforce this ambitious vision for the future, the Government of Flanders already selected seven so-called transition priorities⁸:

- Dealing with and being prepared for major technological and social changes;
- Taking a leap into industry 4.0;
- Lifelong learning and employment opportunities for every individual;
- Developing a strategy on demographics and carrying out reforms to accomplish future care and welfare;
- Continuing the structural transition towards the circular economy;
- Working on a smooth and safe mobility system; and
- Ensuring an energy transition.

During 2012-15, the materials programme mainly focused on closing material loops, but the Flemish government has broadened its interpretation in the meantime⁹.

The Vision 2050 takes a broader approach of the circular economy where:

- Transversality is more strongly featured. The transition priority "circular economy" is in the joint responsibility of the Ministry of Environment and the Ministry for Economy and Innovation;
- Greater emphasis is put on collaboration across industries and with stakeholders.

The scope of ambition has broadened to reach out to a significant number of stakeholders who were previously not or insufficiently involved. The scope has broadened to include materials, energy, water and food. The table below summarises the main drivers and barriers of the initiative.

	Drivers	Barriers
Political	<ul style="list-style-type: none">• Environmental legislation• Aim to become Europe's recycling hub	n.a.
Economic	<ul style="list-style-type: none">• Almost no primary raw materials, fear of job loss	n.a.

⁷ <http://www.vlaanderen.be/int/europese-unie/en/news/vision-2050-long-term-strategy-flanders>

⁸ Ibid

⁹ Deckmyn, 2017: Adaptive Policy for a Circular Economy

	<ul style="list-style-type: none"> Possible new jobs in the circular economy 	
Societal	<ul style="list-style-type: none"> Environmental problems 	n.a.
Technological	<ul style="list-style-type: none"> Aim of breakthroughs in sustainable materials management 	<ul style="list-style-type: none"> Lack of knowledge and skills
Legal	<ul style="list-style-type: none"> EU environmental legislation 	<ul style="list-style-type: none"> A considerable amount of current legislation is not compatible with the CE, since it has been introduced for other reasons

2.2 Strategic and operative objectives and milestones of the initiative

Strategic and operative objectives

Plan C aims to accelerate breakthroughs in sustainable materials management and the circular economy. The three core activities are: shaping a vision, activating a self-learning network and supporting and strengthening of transition experiments¹⁰.

The Policy Research Centre Sustainable Materials Management (SuMMa) brings together researchers from UGent, KU Leuven, UHasselt, University of Antwerp, HUB and VITO, and investigates which economic, policy and social preconditions need to be fulfilled in order to realise the transition to a material-efficient circular economy.¹¹

In order to make progress in the evolution towards a circular economy in Flanders, the Flemish Materials Programme (FMP) is now implementing 63 projects in cooperation with active partners and with a clear time schedule. Special focus is placed on five sectors or clusters for which roadmaps have been developed: critical and valuable metals, construction, raw materials from waste water, food and agriculture, and chemistry and plastics.¹²

In addition, there is an emphasis on:

- The circular city;
- Circular business strategies; and
- Circular procurement.

The strategic projects of the FMP are¹³:

- Transforming Flanders into a recycling hub for Europe through our seaports;
- New jobs in the circular economy;
- Potential for a circular economy at several spatial scales (case region Genk);
- Strengthening the metal recycling industry in Flanders;

¹⁰ <http://vlaanderen-circulair.be/nl>

¹¹ <https://hiva.kuleuven.be/en/research/research-projects/policy-research-centre-sustainable-materials-management-summa>

¹² <http://www.vlaamsmaterialenprogramma.be>

¹³ <http://vlaamsmaterialenprogramma.be/flanders-materials-programme>

- Innovative building concepts for energy- and material-conscious construction; and
- Business model innovation.

Targets

The initiative so far has no overall target, there are a few targets for recycling but they differ across municipalities. The initiative is currently working on expanding their set of indicators as the basis for a broader target setting.

Economic clusters were chosen for their potential for improvements from a primary resource or material perspective and for expertise existing in Flanders. The clusters are managed by business federations. They are:

Sustainable materials management in construction (led by the Flemish Building Confederation). In this area, there are several important goals: Closing or optimising the materials cycle for important materials that are released during the demolition of buildings. Processing and the efficient use of recycled materials from non-stony construction and demolition waste. Alternative design of materials in order to stimulate harmonisation within the chain.

Bio-economy (led by the Interdepartmental working group on Bio-economy). This working group has developed a vision and strategy, through consultation between the government and the sector, to pave the way for a sustainable bio-economy by 2030. In addition, an action plan bio-economy has been developed, the actions of which are initiated in the period 2015-2020 including valorising and marketing recovered nutrients and organic carbon, an inventory of biomass flows and potential applications, the identifying and stimulation of the demand for bio-based products, and attention to all the objectives of the bio-economy in the renewable energy policy in Flanders.

Sustainable chemistry and plastics (led by Essenscia, the Belgian Federation for Chemistry and Life Sciences Industries). This cluster has defined the following actions till 2020: Removing legal barriers for closing plastics cycles, promoting the recycling of fibre-reinforced thermosets, promoting cooperation and knowledge exchange between designers, manufacturers and recyclers in the plastics sector, improved mapping of and communicating about current initiatives around plastics and developing and promoting an international quality label for recycled plastics.

Critical metals (led by Agoria, federation for the technology industry)

This cluster investigates how to design products in such a way that metals can be recovered easily from them. It furthermore discusses innovative business models and thoughtful logistics systems in which coproducts that contain metal effectively can be collected at the end of their life cycles for high-quality recycling.

Enablers were chosen to reduce obstacles encountered in projects, business cases and innovation. They include:

Sustainable design

Design of products, services and systems in such a way that they simultaneously bring economic, social and ecological value.

Smart collaboration

Closing material cycles in a high-quality manner through innovative forms of collaboration. Because citizens are crucial in achieving a circular economy, the Flemish Materials Programme will also focus on education and raising awareness.

Smart Investments

Assessing options for the government and the financial sector and companies to invest in sustainable materials management through grants for innovation, through interesting loans and through a green policy for private and public procurement with a focus on materials.

New materials and new material technologies

Assessing options how new materials, such as nanomaterials and composites, and new production and recycling technologies can contribute to reducing material consumption with a lower environmental and health impact and to closing cycles better.

Pursuing catalytic impact

Central to the agenda of the Flemish Material programme is reaching out to a small number of pioneering SMEs to encourage innovation in product design, business models and collaborative approaches across and between value chains. Restricting intervention to a small number of companies was initially dictated by budget limitations¹⁴. However, Plan C has now embraced its role as an 'activating' body that catalyses change by connecting and challenging the most innovative companies and enabling them to lead others, rather than trying to directly influence the large number of SMEs in Flanders.

Barriers

The FMP is working to break down other barriers to its implementation beyond funding restrictions. An important enabling aspect of a circular system is public procurement, but procuring institutions often focus more on finding the lowest cost options rather than looking at total lifetime cost, which opens up opportunities to incorporate circular economy thinking. Low global resource prices, along with high labour costs, curb the profitability of remanufacturing. Another obstacle is a lack of knowledge and skills: a furniture remanufacturing plant was planned in Flanders, but it proved difficult to find workers sufficiently skilled to operate it.

Cooperation between public and business

Successful cooperation between stakeholders, based on sharing responsibility for projects, is the keystone of the programme's approach to implementing its vision and overcoming barriers. Of the 45 actions in the Agenda 2020 plan, 10 are run by OVAM, which focusses on encouraging action in larger organisations, 20 by industry associations such as FEBEM (Federation of Environmental Companies), Vlaamse Confederatie Bouw, (Flemish Construction Federation), essenscia Flanders (The Flemish Federation for Chemistry and Life Sciences Industries), and Agoria (Federation for the Technology Industry), and 15 by other organisations, including the Department of Economy, Science and Innovation, the Flemish Institute for Technological Research (VITO) and the Bond Beter Leefmilieu (Federation for a Better Environment).

Taken together, these actions are designed to create the supporting environment that encourages companies to take action. Looking to the future, the programme as a whole begins to link circular economy ideas to wider societal challenges like moving towards renewable energy, developing new industrial policy and planning cities of the future.

Green Deal 'Circular Procurement'

This Green Deal is an initiative of Circular Flanders, VVSG, The Shift and Union for a Better Environment. In the course of this year, Minister Schauvliege is further supporting circular

¹⁴ Deckmyn, 2017: Adaptive Policy for a Circular Economy

economy projects with an additional amount of EUR 1.7 million. A part of this is reserved to support financially the pilot projects concerning circular procurement.

The circular economy system focuses on maximum reusability of products and raw materials, and minimal loss of value. Circular procurement is therefore a new way of purchasing for businesses and takes account of humanity, planet and wallet. It is a process in which you 'buy change', for example by opting for reusable materials, bio-based or biodegradable materials, by pooling or sharing resources and products with other organisations or by purchasing a products' pleasure of use instead of the product itself¹⁵.

VITO signed the Green Deal Circular Procurement with more than 85 purchasing organisations (from government agencies such as OVAM and VRT, local governments such as the city of Kortrijk or Ghent, to companies and financial institutions like IKEA, Colruyt, Janssen Pharmaceuticals, ING, etc.) and around 50 supporting parties (research centres, federations, etc.), including the Minister for Environment Joke Schauvliege.

The signatories of the Green Deal are committed to realise jointly over 150 circular procurement projects by June 2019. A great lever for the circular economy in Flanders.

Projects engaging citizens

Close the Loop

Vlaanderen Circulair also provides online resources like Close the Loop, a tool developed for the fashion industry in collaboration with Flanders DC, an organisation that supports creative enterprises in the region. Close the Loop helps designer and producers figure out the entire life cycle of their garments.

The Shift

The Shift is the Belgian meeting point for sustainability. Together with its members and partners it aims to realise the transition to a more sustainable society and economy. The network brings together a wide range of companies, non-profit organisations and other key societal actors. 370+ organisations take part.

Reburg 2050¹⁶

Reburg, financed by PlanC, was developed as virtual circular city concept to provide a framework for innovators and society, to provoke them to broaden their thinking on the circular economy. PlanC's vision for the future of the circular economy was translated into a series of relevant themes, which would become the framework for the upcoming interview pieces and the pillars of Reburg. They would be: *Entangled Realities*, *Fabcities*, *Bio-Synthetics*, and *Hybrid Systems*. Picking up on certain developments, both present and future, allows for the possibility to speculate on how they might manifest and affect our daily lives, especially how it shapes the current and future social fabric and interactions. The City of Reburg would be told through the eyes of future professionals in a series of crafted multimedia scenarios, highlighting various touch points and giving insight into how ideas of circular economies could be adopted in the present. By building a digital city on an online platform to capture the episodes, the concept not only became easily accessible from anywhere online but also has the capacity to be easily distributed via social media. The city of Reburg is made up of a series of touchpoints, some specific to a certain future professional, but all connected and having some sort of overlap.

The civil society network TransitieNetwerk Middenveld is organising presentations and workshops around Flanders on the Reburg concept. Vlaanderen Circulair has set up a

¹⁵ Deckmyn, 2017: Adaptive Policy for a Circular Economy

¹⁶ <http://pantopicon.be/portfolio/welcome-to-reburg-the-circular-city/>

network of Flemish cities and municipalities where participants can share their experiences with the circular economy and help promote new policies in the area.

Learning networks¹⁷

In order to help municipalities in the source-separated collection of waste streams, the OVAM offers customised support. The basic principle is that municipalities within the same cluster can learn from each other. For this reason, the OVAM has started up 'learning networks' in collaboration with the Association of Flemish Cities and Municipalities (VVSG) and Interafval (Inter-municipal Waste Agency). Within such a network, best practice will be shared between municipalities. Municipalities with the largest amount of residual waste will receive extra support. There may be various causes for high residual waste figures. For example, a municipality with high quantities of bulky waste will already have high residual waste figures. The introduction of VFG waste collection can also reduce the amount of residual waste.

3 Resources and management

Basis of Circular Flanders is the Flemish Materials Programme operated by the Public Waste Agency of Flanders, OVAM. Circular Flanders also consists of the non-profit organisation Plan C, the Sustainable Materials Management policy research centre (SuMMA) and the Agenda 2020. PlanC and SuMMA were merged in 2017 with the Flemish Materials Programme in a process establishing Circular Flanders.

3.1 Financing model

While the Flemish Material Programme has now been recognised by the government in Flanders as a strategic programme, which might attract more funding; the focus is still on harnessing currently available subsidy programmes rather than on generating new ones. From 2012 to 2015, OVAM and its strategic partners invested EUR 5.5 million in Flanders Material Programme projects: EUR 3.6 million on personnel and EUR 1.9 million on undertaking applied policy research, developing unique tools and communicating the circular economy. In addition, there is EUR 6 million in circular innovation/entrepreneurship subsidies (Flanders Innovation and Entrepreneurship) and EUR 30 million in investment capital by Flanders Environmental Holding¹⁸. This is available for circular economy projects during several years; it supports business investments with a TRL level of 4-6).

Vlaanderen Circulair had two calls for proposals to support circular economy projects. 63 out of 143 applications received subsidies (Figure 1). In 2017, the budget for projects was EUR 4.8 million within the "Green Deal Circulair Procurement (15% of the funding), and the "cities and circular companies" (85% of the funding).



Figure 1: Distribution of projects in Vlaanderen Circulair

¹⁷ Deckmyn, 2017: Adaptive Policy for a Circular Economy

¹⁸ Personal communication with Circular Flanders, January 2018

There are also other sources of funding. The fund “Sustainable Material and Energy Use” (Duurzaam Materialen- en Energiebeheer), an initiative of Indaver and the environmental organisations ABLLO and BBL, wants to inspire people, organisations, and businesses to change their behaviour and support energy and material saving. Since 2007, 50 projects received EUR 1.5 million from this fund. Subsidies are also granted from the Agentschap Innoveren & Ondernemen.

3.2 Key actors involved in the initiative

Flaanderen Circulair is the focal point of the circular economy in Flanders. It is a partnership of companies, science and government. After the inclusion of Plan C and SuMMa a newly unified team started in 2017. A range of stakeholders share human and financial resources in the unit, which is headed by a public-private steering group. Flaanderen Circulair provides a single, effective hub for the circular economy in Flanders.

Monitoring system and evaluation of the initiative

There is still no clear framework for monitoring the progress of a circular economy (CE). Likewise, there is no transparency on how materials flow or are stored in society. This creates many uncertainties that have a tendency to get in the way of new activities designed to close material loops. Present day monitoring, moreover, often only takes place at the level of a region or country, which can lead to shifts in terms of impact. Flaanderen Circulair is currently working on defining a broader set of indicators¹⁹.

3.3 Level and type of citizen engagement in the initiative

NGO initiatives can contribute to CE via a variety of activities and strategies:²⁰

Raising awareness among citizens and consumers: Via the provision of information, consciousness-raising and calls to action, NGO initiatives can exercise considerable influence on consumer practice. An example of this is the brochure from Goodplanet on the lifecycle of a mobile phone²¹.

Training: Many NGO initiatives invest in the training of consumers, personnel, local governments. For example, the Bond Beter Leefmilieu – the Flemish umbrella organisation for the environment – provides training to local governments in Flanders to make their purchasing policy and public contracts circular²².

Audits and ‘naming and shaming’: Proactively investigating the good and the bad ‘pupils’ and communicating the findings can influence consumption choices. After a study, for example, Rankabrand published a sustainability ranking for mobile phone brands²³.

Labelling: Environmental labels for products and processes have been in existence for some time, but now there are labels that focus specifically on elements of the circular economy. See, for example, the Cradle to Cradle product label of the Cradle to Cradle Products Innovation Institute²⁴.

Production: In some instances, NGOs themselves can become producers with a view to influencing the established producers as a niche player. The Dutch NGO Fairphone, for example, is itself a producer of sustainable smartphones. Throughout the value chain it works with several trade partners and tries to involve them in its sustainable options. Fairphone also considers transparency to be a priority and hopes that other companies will follow it in this regard. In addition, Fairphone also influences consumers by keeping them

¹⁹ <https://hiva.kuleuven.be/en/research/research-projects/policy-research-centre-sustainable-materials-management-summa>

²⁰ Happaerts & Van Eynde, 2014

²¹ www.goodplanet.be/gsminzameling/docs/02_GSM-Levenscyclus-NL.pdf

²² www.circulair-aankopen.be

²³ www.rankabrand.org/static/electronics-greenfair-ranking-report-2014.pdf

²⁴ www.c2ccertified.org

informed, involving them via crowd funding, and guiding them when replacing parts and components. The Fairphone smartphone can be dismantled and is thus easy to repair²⁵.

4 Policy instruments and wider policy-mix used for implementing the initiative

4.1 Description of the R&I policy instruments used for implementing of the initiative

An important specific instrument within the framework of waste and materials policy is so-called extended producer responsibility (EPR)²⁶. Flanders is familiar with several examples in this regard, including the FostPlus blue bag for PMD packaging, the collection of used batteries by Bebat and the Recupel contribution towards recycling discarded electrical and electronic appliances. The idea behind this system is that the responsibility of the producer of the goods continues through to the waste phase and does not stop at the moment of sale. EPR systems oblige producers (or importers) to collect a fraction of the number of goods they introduce to the market and have them recycled in an adequate manner. In most instances, the system is not applied to producers individually, but is set up rather as a system of collective responsibility. The sector thus establishes an organisation (mostly non-profit) that organises collection and recycling on behalf of the participating members. The members finance the activities of the organisation in proportion to the volume of goods they introduce to the market²⁷. This collective form of EPR tends to be much more efficient because it can capitalise on positive advantages of scale by establishing a single collection system and by compelling better prices from the processors of the collected materials. EPR systems are widely used in the EU and have clearly demonstrated their worth. Improvement remains possible, however, by regularly adjusting collection goals, for example, or by varying the levy according to the recyclability of the product, or by taxing the sector on the fraction of waste that has not been collected.

4.2 Connections with other policies

The connection with other policies is so far not sufficiently developed and inconsistencies with existing policies can be noted.

4.3 Key turning points of the initiative and policy adaptation measures.

Major changes / turning points of the initiative	Description of the flexibility mechanism / policy adaptation measures
<p>An important turning point was the embedding of the Flemish Material Programme in Vision 2050. This aims a social, open, resilient and international Flanders that creates prosperity and well-being. To achieve a broader societal impact, Flanders Circulair was founded to reach out to a large range of stakeholders.</p>	<p>Flanders Circulair mostly provides incentives. So far there is no comprehensive set of specific policies.</p>

5 Realised or expected outputs, outcomes and impacts

5.1 Outputs, Outcomes and new instruments

²⁵ <https://www.fairphone.com/en/>
²⁶ Dubois, 2012
²⁷ Dubois, 2012

The outputs and outcomes of the initiative are difficult to quantify as no overall targets have been set so far, and no comprehensive indicators to monitor the initiative exist.

5.2 Impacts

For Flanders, estimates show that investing in a circular economy could cut materials expenses by 2% to 3.5% of GDP, and could create 27 000 new jobs, ranging from high-tech positions to low-training positions²⁸.

Other impacts mentioned are²⁹:

Education: A toolkit on Ecodesign for higher education;

Smart design: Four dissemination tools and two business challenges, including the 'additive design challenge' to create useful products made with circular economy techniques;

Business model innovation: Three dissemination tools for business model innovation and a learning network (including a circular economy masterclass for SMEs).

5.3 Summary of the key indicators.

Key indicators	
Timeline:	2012-2020
Objective and targets:	Transition to a circular economy, no quantitative targets yet. Part of a broader vision that aims a social, open, resilient and international Flanders that creates prosperity and well-being in a smart, innovative and sustainable way, in which every individual counts.
Total budget:	From 2012 to 2015 OVAM and its strategic partners invested EUR 5.5 million in Flanders Material Programme projects: EUR 3.6 million on personnel and EUR 1.9 million on undertaking applied policy research. In addition, there is EUR 6 million in circular innovation/entrepreneurship subsidies (Flanders Innovation and Entrepreneurship) and EUR 30 million in investment capital by Flanders Environmental Holding.
Annual budget:	No
Share of budget, public funding:	100%
Share of budget, private investment:	0%
Leverage effect (additional public/private investments the initiative has triggered):	Can be public (e.g. additional regional level public funding supplementing the initial national budget) or private (i.e. the amount of additional private investments the initiative has mobilised)
Key (official/public) indicators applied for monitoring the progress towards the targets:	No overall quantitative targets yet.

²⁸ SuMMA: Preliminary analysis of the economic importance of waste management, recycling and the circular economy in Flanders (<http://bit.ly/2h3cX9r>) (Dutch version only).

²⁹ <https://www.ellenmacarthurfoundation.org/case-studies/belgium-flanders-materials-programme>

Other key indicators (e.g. outputs/outcomes/impacts):

27 000 new jobs expected, business model innovation will be accelerated.

6 Conclusions and lessons learned

6.1 Identification and assessment of key strengths and weaknesses of the initiative

Strengths	Weaknesses
Organisational setup enabling a wide societal outreach and interaction: <ul style="list-style-type: none"> • Plan C: network of frontrunners, long term vision and experiments with new business models • Policy research centre SuMMa: cooperation between Flemish Universities and VITO research on economic, policy-related and societal conditions to realise the shift towards a circular economy. • Agenda 2020: concrete priority multi-stakeholder actions streamlining actors and initiatives 	No clear quantitative targets yet No comprehensive indicators yet to monitor the progress
Linking sustainable materials management to other grand societal challenges (renewable energy, new industrial policy, urban planning)	Limited public funding available, the focus is still on harnessing currently available subsidy programmes rather than on generating new ones
Connecting bottom-up and top-down initiatives	

6.2 Lessons learned and key messages for European R&I policy

One of the key lessons is that the linking of sustainable materials management to other grand societal challenges (renewable energy, new industrial policy, urban planning) helped to gain broad support for the initiative of key societal and economic players, including business associations that are actively involved.

Another lesson is the role of frontrunners. Central to the agenda of the Flemish Material programme is reaching out to a small number of pioneering SMEs to encourage innovation in product design, business models and collaborative approaches across and between value chains. The small number of SMEs act like an activating body that catalyses change by connecting and challenging the most innovative companies and enabling them to lead others, rather than trying to directly influence the large number of SMEs in Flanders.

Another lesson is a considerable amount of current legislation is not compatible with CE, since it has been introduced for reasons other than CE. There is need for an alignment at the national scale and this may be considered in upcoming EU frameworks.

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Vlaanderen Circulair (Circular Flanders) has the vision of a transition to a circular economy. It consists of the Flemish Materials Programme, Plan C, and the Sustainable Materials Management (SuMMa). Since 2017 they are integrated in OVAM, the Public Waste Agency of Flanders. Plan C includes a network of frontrunners and creates a long term vision and experiments with new business models, while the Agenda 2020 enables concrete priority actions streamlining actors and initiatives. Vlaanderen Circulair has a strong focus on connecting bottom-up and top-down initiatives and engaging all parts of the society.

The Sustainable Materials Management (SuMMa) policy research centre, also established in 2012, supports evidence-based policy in this exceptionally multi-departmental domain. the focus is still on harnessing currently available subsidy programmes rather than on generating new ones. OVAM, the Public Waste Agency of Flanders is the main governing body of Vlaanderen Circulair.

The circular economy in Flanders is embedded in a broader societal vision for Flanders, Vision 2050, adopted in 2016, that aims a social, open, resilient and international Flanders that creates prosperity and well-being in a smart, innovative and sustainable way, in which every individual counts.

Studies and reports

