



The **Flanders'** **Materials Programme**



In barely half a century the world population has more than doubled. The steep rise of the global middle class causes an exponential growth in consumption. This is the first generation that will be confronted with the depletion of certain raw materials. All over the world we are going to have to settle for less: less water, fewer raw materials, less energy.

For over 30 years waste was mainly a local problem. Now resource security and efficiency has become a grand societal challenge. Flanders and Europe have limited own natural resources at their disposal and largely depend on import. Our inventiveness in managing these limited supplies will determine our future welfare and wellbeing. We will have to fundamentally redesign our production and consumption, food and transport systems. Transition requires new technologies, but also non-technological changes, a shift in mindset and behaviour. In 2010, during the Belgian EU presidency, the council conclusions on ‘sustainable materials management and sustainable production and consumption’ put the ‘circular economy’ on the agenda. They were mainly based on the vision and experience of the Public Waste, Materials & Soil Agency (OVAM) in the Flemish region, and our pioneering work so far with regard to sustainable materials management within the OECD.

Mid 2011, the Government of Flanders designated ‘Sustainable Materials Management’ as one of the thirteen major societal challenges for Flanders, as part of ‘Vlaanderen in Actie’ (Flanders in Action), the Government of Flanders’ ambitious project for the future. Flanders also expressed the ambition to be one of the top European regions in each of these societal areas by 2020.

OVAM was assigned with developing a transition project on sustainable materials management, building on 30 years of experience in waste management. By transposing the EU Waste Framework Directive into a new materials decree, rather than simply revising the waste decree in place, the foundation was laid for a systemic approach. The scope of action was extended from the end-of-life phase to the entire materials cycle. We now look at the impact of design on the waste phase, search for ways to promote industrial symbiosis, or think about how shared use of products can reduce our footprint.

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The global context, the complexity of the resource challenge and the interconnectedness of the economic, ecological and social dimension will force us to focus even more on those material streams for which Flanders can make a difference on a European and a global scale. This means that all actors in society, from policy makers up to knowledge institutions, civil society and the industry, have to agree on clear and bold choices. These choices are facilitated by linking the available expertise and experience with innovative entrepreneurship and long-term vision, enabling us to build a policy of smart specialization.

Transition (management) is not just about systems and paradigms; above all, it is a story of people. The Flanders' Materials Programme is unique in Europe in the way that government, industry, civil society and knowledge institutes and universities are conducting a programme together. If we want to realise the transition to a circular economy, we must have the courage to set a common agenda and to find new ways to cooperate - on regional, national and EU level; even if we sometimes have opposing interests. But above all, this transition is a story that builds on commitment, on the shared desire to retain our leadership, and the belief that together we can make a difference if we smartly combine an inspiring long-term vision, dedicated education and research, and public-private field initiatives.

With this brochure we want to underline the growing importance of sustainable materials management in Flanders, Europe and the rest of the world as the cornerstone of a future-proof society, and show you how the partners of the Flanders' Materials Programme are helping to build solutions for a changing world.

We hope you enjoy your reading.



Henny De Baets

ViA integrator transition Sustainable Materials Management and
Administrator General OVAM

The challenge:

Increasing scarcity of resources and materials

Our wellbeing and prosperity are inextricably connected to raw materials, the building blocks of our society. The demand for resources and materials is increasing due to the growth of the world population and the rising standard of living. On top of that, many materials are becoming scarcer and thus more expensive. This doesn't merely apply to crude oil as a resource for many plastics, but also to copper, lead, phosphate as an essential ingredient for crops, or critical and rare metals required for green technologies such as windmills and solar panels, as well as for many widespread consumer goods like cars, mobile phones and laptop computers.

Flanders and Europe hardly have any raw materials of their own. Since we depend very much on import, geopolitical relations and intense price fluctuations of raw materials make our long-term outlook uncertain.

Our current use of materials puts an ever larger strain on our environment. Think about the energy-intensive production of consumption goods, greenhouse gas emissions and climate change, loss of biodiversity and air pollution.

The solution: Sustainable materials management in a green circular economy.

Waste represents an increasingly important potential for secondary raw materials.

Advanced sorting and recycling measures, numerous soil remediation projects, taxes for landfilling and incineration, environmental policy agreements, 'polluter pays' systems, etc. have propelled Flemish waste management to a leading position in Europe and the world.

Joke Schauvliege
Flemish Minister of Environment,
Nature and Culture



The Flanders' Materials Programme is a turning point. Concrete actions and projects allow Flanders to turn the waste policy into a sustainable materials policy, but only if businesses, centres of expertise, NGOs and the government work together. Those with foresight, will grab this opportunity.

However, recycling valuable materials is often still a difficult process that requires a lot of energy and logistics. That is why we need to design products in such a way that they can be easily mended, reused, dismantled and recycled.

To achieve sustainable materials management we need more than efficient production processes and technological innovation. New business models and innovative services have to reduce the need for materials.

New forms of collaboration between designers, producers and waste disposal companies are also required. Consumers must be informed about the footprint of products and services. Logistics must keep the materials moving within closed cycles. The government must support the transition to a circular economy through a dedicated investment programme and an adapted legislative framework.



Erik Mathijs

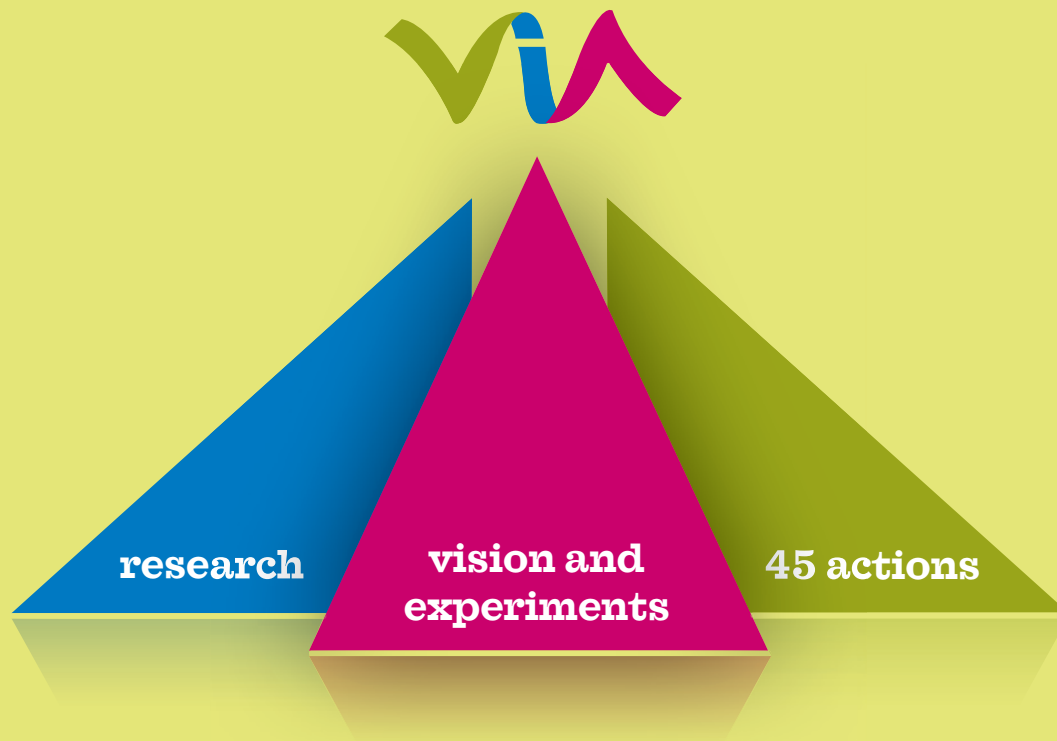
Promoter-coordinator TRADO - Research centre
Transitions for Sustainable Development

The Flanders' Materials Programme is an important stepping stone in the transition towards a sustainable society. Managing materials sustainably requires a multidisciplinary approach in which actors from different segments of society collaborate. After all, we need a culture shift to solidify and secure the highly necessary innovations.

Flanders' Materials Programme: Working together on the transition to sustainable materials management.

The Government of Flanders has the ambition to belong to the top 5 European regions when it comes to sustainable materials management. To realise this, the Flanders' Materials Programme was launched in 2012 as part of 'Vlaanderen in Actie' (Flanders in Action).

Neither the government nor businesses, civil society, centres of expertise or consumers have the knowledge or the instruments to independently achieve the transition to a circular economy. Therefore, partnerships are crucial. Through the Flanders' Materials Programme, government, industry, centres of expertise and civil society are joining forces. Carefully chosen priorities ensure that human resources and other means are used efficiently. This integrated approach must lead even faster to the circular economy becoming a distinctive market advantage for Flanders.



The **three pillars** of the **Flanders' Materials Programme**

In the Flanders' Materials Programme we combine ambitious long-term vision development, policy-relevant research, and concrete actions. This is done respectively in Plan C, the Policy Research Centre Sustainable Materials Management (SuMMa) and Agenda 2020; three pillars that reinforce each other.



Brigitte Mouligneau

Head of Staff of the Government of Flanders and Process Manager 'Vlaanderen in Actie' (Flanders in Action)

In the Flanders' Materials Programme as part of 'Vlaanderen in Actie', we determine ambitions together and make the transition from the drawing board to realisation. We do so each from our own expertise, with the aim of achieving a sustainable Flanders by 2020.

1. Long-term vision and experiments: Plan C

Plan C aims to accelerate breakthroughs in sustainable materials management. The three core activities for this are: shaping a vision, activating a self-learning network around sustainable materials management, and the support and strengthening of transition experiments.

 www.plan-c.eu

2. Policy-relevant research:

Policy Research Centre Sustainable Materials Management (SuMMa)

The Policy Research Centre Sustainable Materials Management 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.

 www.steunpuntsumma.be

3. Action: Agenda 2020

In order to make visible progress in the evolution towards a comprehensive circular economy in Flanders, we are now focussing on the implementation of 45 concrete projects with active partners and a clear time schedule.

 www.vlaamsmaterialenprogramma.be

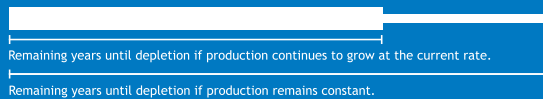
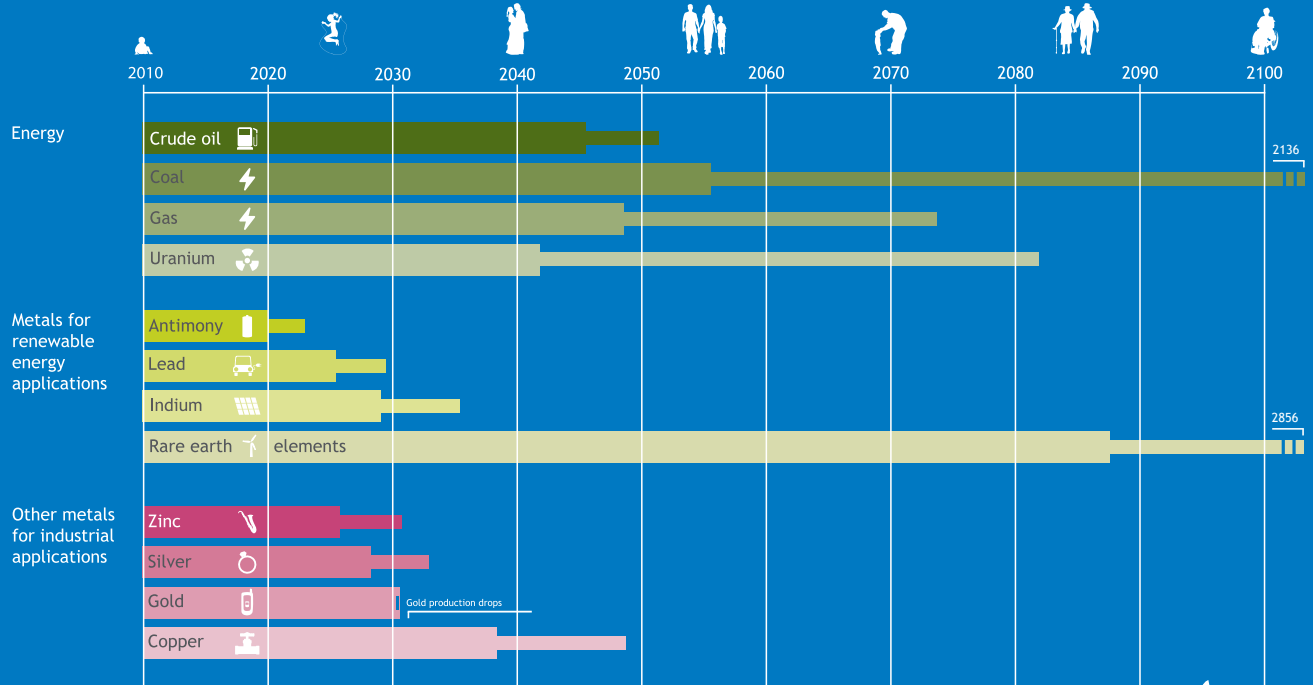
 Join the debate on Twitter via #VMP2020

Added value of the 3-pillars

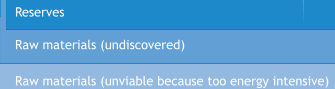
structure: The actions of Agenda 2020 are fed by SuMMa research, verified against the vision developed by Plan C, and reinforced by the lessons learned from Plan C experiments.

Based on its extensive experience in waste recycling, the public waste agency of Flanders OVAM is the coordinator and catalyst of the Flanders' Materials Programme. A steering committee watches over the roll-out of Agenda 2020 and the complementarity of the three pillars of the Flanders' Materials Programme. The member organisations of the Flanders' Materials Programme steering committee co-own the FMP and Agenda 2020. Meet the steering committee of the Flanders' Materials Programme on the last page of this brochure.

Born in 2010: How much is left for me?



Calculations based on proven reserves:



Sources: US Geological Survey, Adroit Resources, World Bureau of Metal Statistics, International Copper Study Group, World Gold Council, Minmetals.com, Roskill Nickel Report, Cordell et al (2009), Smill (2000), Silver Institute, World Nuclear Association, International Lead and Zinc Study Group, Wikipedia. Source (fossil fuels): BP Statistical Review of World Energy 2010.

Photo: Shutterstock

Plan C

According to Plan C, the challenge of realising a circular economy is an opportunity to lead the world in finding and developing new possibilities that create added value for our economy, environment and society.

Plan C, the Flemish transition network for sustainable materials management, is an open, low-threshold and cross-sector network that accelerates game-changing breakthroughs in sustainable materials management.

We achieve this through three contributions:



Plan C is frontrunner in a continuous process of shaping visions on sustainable materials management.



Plan C positions itself in the domain of sustainable materials management as an open and diverse learning network for finding and disseminating new insights and practices.



Plan C commits itself to supporting and strengthening innovative concepts to enable the transition to a real circular economy.

We are convinced that a more sustainable materials management can only happen in synergy with various other actors. Therefore, Plan C puts its network, the Plan C Community, at the centre. We bring together people from different layers of society to further cross-fertilisation, in order to learn together and strengthen each other.

Policy Research Centre Sustainable Materials Management

The Policy Research Centre Sustainable Materials Management (SuMMa) researches the role of policy in the transition to sustainable materials management. SuMMa's mission is threefold: providing scientific insights about policy-relevant challenges, supporting stakeholders based on interdisciplinary cooperation, and building bridges between stakeholders to improve knowledge exchange and cooperation. The scientific research is organised in a matrix of five clusters, each of which studies a crucial aspect of the transition to sustainable materials management.



Karel Van Acker

Coordinator KU Leuven Materials Research Centre
and Chairman Plan C and SuMMa

In Flanders, KU Leuven is one of the pioneers in Sustainable Materials Management. Making the design, produce, use and reuse of materials and products more sustainable is essential to the economy and society of the future. It is not a voluntary nice-to-have, but an absolute necessity and at the same time a direction rich in opportunities. This transition requires fundamental changes on a system level. From its uniquely interdisciplinary context as a university, KU Leuven aims to realise this transition together with its partners, and educate future generations so that they become committed and sustainable consumers, producers and decision makers. To provide a solid basis for the Flanders' Materials Programme we took the initiative to set up the Policy Research Centre Sustainable Materials Management, and to ensure involved commitment of all actors in society in shaping the vision we cofounded Plan C. Through an open and intensive cooperation in the Flanders' Materials Programme we hope that these efforts will gradually become mainstream for government, businesses and citizens.

The 5 clusters:



System analysis

This is where the social and political mechanisms that drive the transition process are clarified. What different actors consider to be sustainable materials management, and which themes are brought to the fore at a EU level and how Flanders responds to them, is studied.



Monitoring and evaluation

This cluster contributes to knowledge gathering: how can material streams between economic sectors be mapped, and which indicators can be used to measure resource efficiency?



Economic aspects

Environmental benefits are weighed against economic costs. We examine which economic stimuli can effect behavioural changes, and which policy instruments can facilitate these incentives.



Legal conditions

Legislation can be an incentive as well as an obstruction for the transition to sustainable materials management. This cluster researches which obstacles exist and to what degree more coherent legislation may remove these hurdles.



Multi-actor governance

This is about the cooperation between the various actors in society: government, designers, industry, traders, NGOs, consumers and centres of expertise. We examine how trust and dialogue between these groups can be best achieved.

Flanders' Materials Programme:

9 levers for a circular economy in 2020

In order to create the foundation for a green economy in which materials circulate in smart, closed loops by 2020, within the Flanders' Materials Programme we focus on 45 actions divided across 9 crucial levers.

1 Sustainable design

Sustainable design is the foundation for the correct management of materials. Designing and inventing new products, materials, chains and product-service combinations are a fundamental part of a circular economy. Choices made during the design phase will determine the course of the life cycle of materials. Sustainable design means going a step further and promoting a sustainable approach to fulfilling our socioeconomic needs by looking at all phases, from raw material, through production, use and back. It may be necessary to remap all links in the chain, including business models, logistics, operational business management and client relationships. This is the challenge of sustainable design in Flanders. The use of socially responsible, non-damaging, renewable or recycled materials is the starting point for this. Sustainable design is also at the core of production processes and products that require less energy and materials. It focuses on products with a longer lifetime that are easily reusable, repairable or recyclable.

Concrete steps have already been taken to familiarise future designers with sustainable design: the Flemish design academies have signed an agreement in which they commit to incorporating sustainable design in their curricula. Other educational programmes will also acquaint themselves with sustainable design by using the EHO kit (Ecodesign in Higher Education). In order to make the sustainability challenges and opportunities visible to small and medium-sized enterprises and the industry, OVAM has developed the Sustainable Innovation System (SIS) toolkit, a convenient tool with which they can make their business operations more sustainable.

Within Agenda 2020, the ambition is to contribute to establishing minimal European requirements for reusability, recyclability and the use of recycled materials. For priority product groups, we strive towards defining material criteria within the framework of the ecodesign directive of the European Union. We also want to show how advanced we are in Flanders when it comes to sustainable design using recycled materials, and to investigate what we can do to stimulate this even more.

1985 Flemish designers use the Ecolizer 2.0 to integrate sustainability into their designs.

150 teachers can start using the EHO kit (Ecodesign in Higher Education).

365 SIS toolkits are being used in Flemish companies.



Bernard De Potter

Administrator General Agentschap Ondernemen (Enterprise Flanders)

The Flanders' Materials Programme brings together all parties involved and can thus help to improve the alignment with other initiatives. Enterprise Flanders drives the breakthrough 'the open entrepreneur' to activate the culture of enterprise in Flanders and make Flemish businesses more competitive on an international level. The agency is also closely involved in determining the 'new industrial policy' which works towards defining the factory of the future, more sustainability and a greener economy in Flanders. In addition, Enterprise Flanders offers businesses a number of grants that can be used for advice on, or investments for, making business processes green. Within the context of the Flanders' Materials Programme, Enterprise Flanders has committed itself to researching how the existing subsidy instruments can be adapted or expanded to utilize them more in support of the materials policy. Design can also be an important way of handling materials sustainably. In this respect Enterprise Flanders, via the Design Platform, also contributes to sustainable design.

- Action 1:** Promote sustainable design in the manufacturing industry
- Action 2:** Define tools for sustainable design and distribute them widely
- Action 3:** Propagate the basic principles for sustainable design through education
- Action 4:** Integrate minimum standards for sustainable materials usage in European product directives
- Action 5:** Promote the use of recycled materials in new products

Coordinator: OVAM



Lieze Cloots

Policy coordinator
Bond Beter Leefmilieu (Federation for a Better Environment)

A society that manages materials and natural resources sustainably, requires intensive collaboration between government, businesses, research institutions and civil society. The Flanders' Materials Programme offers a structure for this. Moreover, it provides the impetus to cooperate on concrete issues or opportunities, based on a shared vision.

It is crucial that clear and specific targets are being advanced from within the Flanders' Materials Programme, to serve as guidelines for the actions defined in the action plan. Secondly, the intended transition can only succeed if the Flanders' Materials Programme is integrated in every policy domain, and when relevant policy instruments point in the same direction.

- Action 6:** Stimulate the exchange of residue materials
- Action 7:** Promote sustainable materials management in industrial parks
- Action 8:** Teach tomorrow's citizens and employees the skills necessary to manage materials more efficiently, through higher education and umbrella organisations
- Action 9:** Stimulate innovative business models based on recycling and shared use
- Action 10:** Increase awareness of urban mining among citizens and businesses

Coordinator: Bond Beter Leefmilieu

2 Smart collaboration

In order to manage materials sustainably and reduce their consumption, players in the value chain must have the right information, and we must create the right conditions to promote collaboration. This is how we can realise system innovations and close material loops.

The SYMBIOSE platform and CORE business - projects of, respectively, essenscia, FEBEM, International Synergies UK, Tessenderlo Chemie, Van Gansewinkel, OVAM and Plan C, and of FEBEM, Centexbel, Flanders' Plastic Vision and Federplast - are forms of collaboration between producers aimed at reallocating one company's residues as another company's raw materials. The textile industry for instance already uses recycled plastics successfully. Since it is crucial to also involve all citizens in realising a circular economy, creating awareness is a key factor. Think of the Recupel and Bebat* campaigns aimed at returning electrical appliances and batteries.

These campaigns have to make consumers and employees aware of the important role they are playing in the story of sustainability.

One of the priorities is to put together an introduction kit, in cooperation with the educational networks and umbrella organisations, in order to familiarise future employees in various sectors with the principles of sustainable materials management. With the Federation for a Better Environment as a driving force, we are working on enlarging the existing networks of 'sharing economies'. A 'sharing economy' means shared consumption through lending, sharing or renting. Sharing a car, house or swapping clothes (swishing) are existing but mostly small-scale examples.

October 2013: **482** potential raw materials matches have been identified among **40** Flemish businesses.**

By supporting projects such as a 'sharing economy' and cohousing, the local level can be a catalyst for a sustainable policy.*

* Not-for-profit organization Recupel organises the collection and processing of discarded electro-appliances in Belgium. Bebat is an NPO that, by assignment of the Belgian national and regional governments, collects and recycles used batteries.

* Source: press release FBE, June 2013

** Source: <http://www.fi-sch.be/nl/programmas/valorisatie-vannevenstromen/Symbiose>

3 Smart investments

With this lever we want to encourage the government, the financial sector and businesses to invest in a green circular economy. After all, investing in sustainable materials management and in sustainable technologies creates new markets and new jobs. It increases productivity, enables a more stable economy, and makes us less dependent on imported raw materials. There is also an ecological advantage: a lower consumption of raw materials and reduced waste production.

Government spending accounts for more than 15 percent of the Flemish Gross National Product. That is why setting up a sustainable procurement policy is an important task of the Government of Flanders, led by the Services for the General Government Policy. The government must set an example by giving material criteria a more important role in its expenditures and procurements. Such material criteria have already been developed for the use of recycled plastics to make waste bins and noise barriers. To encourage small and medium-sized enterprises to also make the transition to material-efficient production processes, OVAM, supported by Enterprise Flanders, commissioned the development of a materials scan. In 2013 and 2014, this instrument helps some 250 small and medium-sized enterprises to reduce their environmental footprint and their production costs. This can be achieved for example by using raw materials more efficiently, by using recycled materials and by reusing or selling residual material flows from the production process.

The Flanders' Materials Programme wants to promote a sustainable procurement policy among businesses by adding a materials component to the existing Corporate Social Responsibility initiatives of the Department of Work and Social Economy. Financial incentives are a big influence on the decisions of citizens and businesses. Therefore, in the future, levies and subsidies have to be oriented towards a green circular economy. We assess the allocation criteria of existing subsidies and we collaborate with those responsible towards shifting the financial resources for research.

In 2009 the Flemish industry accounted for almost
40% of the Flemish Economic Value Added,
80% of all R&D investments and
85% of Flanders' export.*

* 'Een nieuw Industrieel Beleid voor Vlaanderen'
(A new Industrial Policy for Flanders), 2011



Dirk Van Melkebeke

Secretary General Department of Economy,
Science and Innovation (EWI)

Sustainable (re)use of materials will be one of the pillars in greening the economy, one of the core elements of a sustainable economy in Flanders.

That is why the Department of Economy, Science and Innovation supports this programme. It is important that the Flemish economic instruments are reformed to support this.

- Action 11:** Government purchases must take sustainable materials management into consideration
- Action 12:** Make sustainable materials management an integral part of Corporate Social Responsibility
- Action 13:** Construct a green fiscal policy to promote a circular economy
- Action 14:** Mobilise more research and innovation subsidies for sustainable materials management
- Action 15:** Encourage small and medium-sized enterprises to make the transition to a more material-efficient production process

Coordinator: EWI and OVAM



Werner Annaert

General Director FEBEM
(Federation of Environmental Companies)

FEBEM has been advocating a different approach to waste management for many years: from problem to opportunity. We support the Flanders' Materials Programme because it can be a catalyst for sustainable materials management and it can encourage the application of our transformed materials. Actual achievements can have a very stimulating effect.

- Action 16:** Direct waste and material flows to the optimal application and processing through the right regulations
- Action 17:** Carefully examine the rules for earthworks to prevent recycled materials from being used for low-grade applications
- Action 18:** Intensify the use of extended producer responsibility as an instrument to close material loops
- Action 19:** Increase consideration for sustainable materials management in the issuing of permits
- Action 20:** Deliberate enforcement of the materials regulations

Coordinator: FEBEM

4

Improved **regulations**

By replacing the previous waste decree with the materials decree, the Government of Flanders has taken a big step towards a legal framework for sustainable materials management, with important principles such as the extended producer responsibility, ‘end of waste’ and life cycle thinking. These regulations can be optimised further, so that they not only impose rules, but also promote the desired evolutions. Starting at the issuing of permits, sustainable materials management must become an even more important criterion. We also strive towards improving and enforcing existing and new regulations.

We are working on extra conditions for granting environmental permits, for example. We are embedding sustainable materials management into the Best Available Techniques (BAT) that industries have to use. As far as enforcement of the regulations

is concerned, inspection agencies will take a more proactive approach. They do not merely report violations, but they also assess with a company’s management how selective waste collection can be better organised.

We want to refine the extended producer’s responsibility and broaden it to include additional product groups. At the moment, we are investigating the product groups of carpets and mattresses. We are aiming at incorporating a stronger focus on ecodesign in the extended producer’s responsibility and want to encourage businesses to market products that are both made from recycled materials and can be recycled again.

The **materials decree** of 2011 replaces

the **waste decree** of 1981 and lays the foundation for sustainable materials management.

5

Sustainable **materials management** in construction

In Flanders the construction industry is the largest consumer of materials. Therefore, sustainable materials management in this sector will make a big difference. This will be the new standard: sustainable buildings and infrastructure that require less energy and materials, that are easily modified and the components of which can eventually be readily reused or recycled. The project owner will reap the long-term benefits of this approach, and this is how choosing sustainable construction and living solutions will become the obvious choice.

Within the Flanders' Materials Programme we are looking for a profitable system to collect windowpanes (flat glass) that are being replaced to meet Flemish and European energy efficiency targets, in order to produce new glass.

96% of all the construction and demolition waste is already being recycled.*

(Indicator calculated as part of the Waste Framework Directive Targets.)*

* Sources: Integraal Milieu Jaarverslag OVAM 2010

(Annual Integral Environmental Report)

Data about granulates received from COPRO and CERTIPRO (2012)

A materials methodology for building components is being developed as a measurement tool that helps architects, contractors and engineers in making conscious material choices.

This materials methodology is already being tested in a series of innovative construction projects, as a stepping stone for large-scale application in the construction industry. However, sustainable construction extends beyond using the right materials. Pilot projects on flexible construction are now being initiated in social housing. This is how we assess the possibilities of the technique of dynamic construction, which allows buildings to be adapted to changing societal needs.

The Government of Flanders owns and rents quite a number of buildings. In the future, the government must exert more influence on the construction methods through Invitations to Tender and competitions. To determine objective criteria for the sustainable management of construction materials, OVAM is working within the Flanders' Materials Programme context to develop instruments to measure the environmental impact of building components.



Marc Dillen

Director General Vlaamse Confederatie Bouw
(Flemish Construction Federation)

Due to, on the one hand the ever increasing population and the resulting need to build more, and on the other hand the ever stricter energy efficiency norms, the construction sector will remain the largest purchaser and consumer of materials. To prevent scarcity of materials, recycling construction materials and closing material loops becomes even more important. Being the most important trade organisation of the construction sector in Flanders, the Flemish Construction Federation feels a deep responsibility to support the Flanders' Materials Programme.

By focusing on the further development of concrete long-term targets to save primary resources for every sector, the impact of the Flanders' Materials Programme can be increased.

- Action 21:** Close the flat glass cycle in the construction sector
- Action 22:** Introduce a materials checklist for government buildings
- Action 23:** Promote dynamic (re)construction
- Action 24:** Promote the use of recycled granulates in road construction
- Action 25:** Develop and distribute a materials methodology for building components, to make conscious material choices

Coordinator: Vlaamse Confederatie Bouw



Frans Dieryck

Managing Director essenscia Flanders,
Belgian Federation for Chemistry and
Life Sciences industries

Sustainability is the leitmotiv of essenscia.

This means, among others, to fundamentally ensure the reuse of materials, to look for new and renewable raw materials.

The added value of the Flanders' Materials Programme is its overall, cross-sector approach. However, it is mainly the role of policy makers to shape this.

Action 26: Develop innovation programmes for closing material loops in the chemical and plastics industries

Action 27: Remove legal obstructions in closing plastics cycles

Action 28: Better map existing techniques for separating collected materials at the source in the chemical and plastics industries and develop new ones

Action 29: Define Flemish indicators for recycling plastics

Action 30: Develop and promote an international quality label for recycled plastics

Coordinator: essenscia

6 Sustainable chemistry and plastics in a closed cycle

When it comes to making its activities more sustainable, the Flemish chemical industry excels at international level. It dedicates increasing attention to energy and materials efficiency, and is committed to using biomass and biomass residues as ‘green’ resources for production processes. Moreover, more and more effort goes into high-value reprocessing of waste streams, selling recyclates and an adapted product design. The chemical industry plays a crucial role in closing material loops through chemical separation or recycling techniques. Therefore, an innovation agenda is being developed that is closely linked to international needs and evolutions.

Existing innovation programmes in the plastics industry have already been mapped. In addition, Flemish innovation programmes linked to the value chains with the highest potential are being initiated as part of FISCH (Flanders Innovation Hub for Sustainable Chemistry).

Through the Policy Research Centre Sustainable Materials Management we collect knowledge about the dismantling of waste products in the chemical industry, as a basis for smarter product legislation that further stimulates the closing of material cycles. Flanders Plastic Vision developed a quality label that indicates the percentage of recycled materials a product contains. With this label, which we continue to promote in Flanders and in Europe, we want to eliminate the bias against recycled plastics. Another priority is to develop generally accepted indicators to track the progress in closing plastics cycles and compare these to the best European examples. By cataloguing plastics that are already being recycled or can be recycled, we are laying the foundation for an action plan to extend the recycling of plastics.

The chemical and life sciences industry - the champions in European [R&D investments](#).*

75% of the world’s largest chemical companies have invested in Belgian production units.*

* Source: www.essencia.be

7 Bio-economy

In a bio-economy the building blocks for all materials, chemicals and energy are derived from renewable resources, instead of fossil resources such as petroleum. A bio-economy encompasses the entire value chain: production of renewable raw materials, industrial transformation into sustainable products and marketing them. An ambitious goal, which can only be realised by a coherent, cross-sector policy. The challenge is to ensure sufficient access to sustainably produced biomass to cater to all our needs. In a sustainable bio-economy we succeed in reconciling food production with valorising materials and energy generation from biomass. Within the Flanders' Materials Programme we mainly want to contribute to realising a bio-economy in Flanders by giving biomass residues a second life.

The interdepartmental work group bio-economy has drafted a vision and strategy to pave the way to a sustainable bio-economy through a dialogue between government and the sector. Demonstration projects on phosphor recovery from waste water, sewage sludge, and manure, are in the making. Through intense collaboration between the Flemish policy domains within the interdepartmental work group bio-economy, we are bringing the needs of the bio-economy to the fore in the process of updating the Flemish renewable energy action plan and the agricultural policy.

We are working on systematically listing the available biomass, and we are determining which biomass residues are suitable for high-value applications or energetic valorisation. To achieve the required data collection and communication, we are striving to establish a common research agenda that explores biomass applications and fills the knowledge gaps. From a European perspective we want to valorise the Flemish demonstration projects and formulate recommendations for creating a market for bio-based products.

The Flemish bio-economy in numbers:

the agricultural and horticultural sectors realise a revenue of

4.56 billion euro, creating

60,000 jobs,

the food industry has a turnover of

30 billion euro, creating

62,000 jobs,

and the bio-based economy has a gross margin of

1.57 billion euro, creating

8,245 jobs.*

* Source : Vlaams Infocentrum voor land- en tuinbouw
http://www.vilt.be/Nood_aan_visie_voor_innovatief_Vlaams_biomassabeleid

Action 31: Consultations across government and sector, aimed at establishing a bio-based economy, taking into account the Flemish context

Action 32: Valorise and market recuperated nutrients

Action 33: List biomass streams and possible applications

Action 34: Identify and stimulate the demand for bio-based products

Action 35: Consideration for all goals of the bio-economy in the renewable energy policy in Flanders

Coordinator: OVAM



Luc Peeters

Administrator General Flemish Energy Agency
(VEA)

Replacing fossil resources by renewable ones is a major challenge for society. VEA closely monitors the Flanders' Materials Programme to align the visions on sustainable materials management, bio-economy and renewable energy. In spite of the fact that in the long run we must strive to reduce the use of biomass for energy production to a minimum, during the transition phase a sustainable materials policy can contribute to realising the targets of the energy policy.



Patrick Van den Bossche

Director metals Agoria, sectoral federation for the technology industry

The Flanders' Materials Programme aims to support projects that involve multiple stakeholders. The recent successful port event in Antwerp, organised by Agoria, OVAM and the Port of Antwerp to intensify the fight against the illegal export of waste, is a case in point. Without the active support of the Flanders' Materials Programme it would have been much more difficult to bring together the stakeholders and put the spotlight on this subject. The challenge of the Flanders' Materials Programme will be to remain sufficiently focused, and to ensure concrete results that are of added value to the technological industry.

Action 36: Collect even more metals for recycling

Action 37: Restrict illegal networks for metal containing waste products

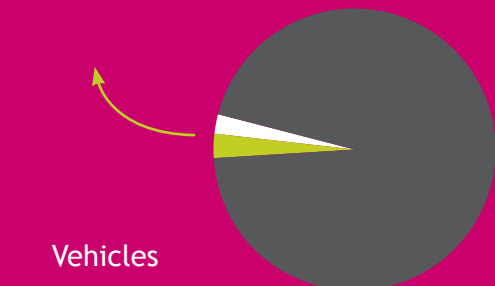
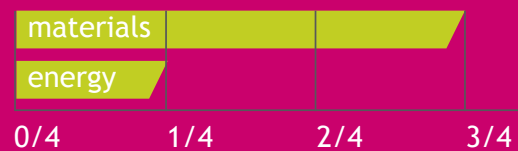
Action 38: Supply quality second-hand electric and electronic devices to developing countries and establish local collection and processing facilities for discarded electronic equipment

Action 39: Traceability and uniformity of recovered metals

Action 40: Increase Research & Development for closing metal cycles

Coordinator: Agoria

93% usefully applied



Vehicles

- 6,065,932 cars registered
- 235,627 cars discarded
- 160,615 cars collected

Sources: FEBELAUTO

8 (Critical) metals in a continuous cycle

Thanks to its high-tech processing infrastructure, innovative collection system, dedicated training and wide stakeholder network, Flanders is already one of the top regions when it comes to closing metal cycles. Products are collected at the end of their life cycle for reuse and high-grade recycling, after which they provide new raw materials for the high-tech and metal sectors. By designing products in a way that allows metals to be easily recovered, and by limiting illegal collection and export of metal containing waste, we want to take further steps towards closing this cycle in the coming years.

Progress has already been made in the dedicated collection of small electronic devices that contain many precious as well as rare earth metals. Thanks to a refinement of the legislation there now is more room for new collection methods for small electric and electronic waste. Important steps have been taken in the fight against illegal exports of metal containing waste. The criteria that were defined for determining whether electronic devices can be reused, have made checks easier. Additionally, Agoria and OVAM are collaborating with the inspection authorities and the European Commission on establishing a collaboration agreement between the major European ports to counter illegal exports and 'port hopping'.

To ensure optimal traceability and a uniform approach, all Recupel (see supra note p.17) contractors are censored by a certified institution. Standards for collection and recycling of 'e-waste' have already been submitted as the basis for new European requirements. For the collection of discarded vehicles, progress has been made on the legal framework for the cooperation between the federal and local governments. This allows the traceability of vehicles to be realised more quickly and the government can promote the collection more rapidly. The unique cooperation between all actors, from producers to processors, has resulted in a rise in the percentage of recycled cars to 93%; an outstanding achievement. Illegal transactions with discarded vehicles are limited by official removals, facilitated by the sector itself.

An investigation was launched at the initiative of Bebat (see supra note p.17) to assess the possibility of establishing a centre of expertise on batteries that will research new recycling techniques. This centre of expertise has to become a partnership between the government, the industry and knowledge institutions.

9 New materials and material technologies

New composites, high-tech materials and material technologies, often combined with innovative business models, contribute to improving the environmental performance of the products in which they are used. It is our ambition that new materials are increasingly being developed according to a model of ‘reduce - reuse - recycle - replace’. Materials have to be made in such a way that they remain in a closed cycle and can easily be reused in the production process at the end of their commercial lifetime.

At the moment, we are charting Flanders’ strengths, both in terms of industry and in centres of expertise, and we are linking this to the European priorities and initiatives on material efficiency. Our aim is to identify gaps, and to discover niches and opportunities for collaboration in the field of research. For Flanders to play a prominent role on a European level, we are working on reinforcing the visibility of the Flanders’ Materials Programme, for instance through the Knowledge & Innovation Community on raw materials.

Based on the opportunities that we identify, we are initiating new research and demonstration projects. For instance, we are thinking of new technologies that produce the intended functionalities using a minimum of materials, integrating bio-based materials in industrial products, and finally, new technologies to recycle complex composites and to recover materials from existing stocks such as industrial landfills. Parallel to the research into new materials and material technologies, we are assessing the impact of the used nanoparticles on humans and the environment. VITO is also researching the possible benefits and disadvantages of nanotechnology. After all, nanomaterials can significantly improve the performance of composite materials, catalysts and electrodes, but the effect of nanoparticles on humans and the environment is still insufficiently clear, let alone their impact on the end-of-life phase and the possibility to reuse and recycle materials that contain nanoparticles.

- Action 41:** List the ongoing and planned research into new materials and material technologies for closing cycles
- Action 42:** Initiate research and demonstration projects on new materials and material technologies for closing cycles
- Action 43:** Integrate criteria for sustainable materials management into (existing) research programmes
- Action 44:** Develop a user-friendly tool to assess the impact of nanomaterials on the environment, health and safety
- Action 45:** Strengthen the Flemish contribution to European material programmes

Coordinator: VITO



Dirk Fransaer

Managing Director Flemish Institute
for Technological Research (VITO)

The Flanders' Materials Programme is the catalyst and driver of the necessary transition to a more sustainable use of materials. It is a unique and broad initiative that aims to put sustainable materials management into practice with all societal and industrial actors. The ambitions of the Flanders' Materials Programme are closely related to VITO's mission to strengthen the socioeconomic fabric of Flanders, hence our clear commitment.

- A1-Promote sustainable design in the manufacturing industry
- A2-Define and distribute tools for sustainable design
- A3-Propagate sustainable design through education
- A4-Minimum standards in European product directives
- A5-Recycled materials in new products

1 Sustainable design

- A6-Stimulate the exchange of residues
- A7-Sustainable materials management in industrial parks
- A8-SMM through higher education and umbrella organisations
- A9-Business models recycling and shared use
- A10-Raise awareness of urban mining

2 Smart collaboration

- A11-SMM in government purchases
- A12-SMM as integral part of CSR
- A13-Green fiscal measures to promote circular economy
- A14-Research and innovation subsidies for SMM
- A15-Transition SMEs to material-efficient production processes

3

Smart investments

- A16-Waste and material streams to optimal application / processing
- A17-Examine the rules for earthworks
- A18-Intensify extended producer responsibility
- A19-Consideration for SMM in issuing permits
- A20-Directed enforcement of the materials regulations

4

Improved regulations



5

SMM in Building & Construction

- A21-Close the flat glass cycle in the construction sector
- A22-Introduce a materials checklist for government buildings
- A23-Promote dynamic (re)construction
- A24-Promote the use of recycled granulates in road construction
- A25-Materials methodology for building components

6

Sustainable chemistry and plastics

- A26-Develop innovation programmes
- A27-Remove legal obstructions in closing plastics cycles
- A28-Technologies for separation at the source
- A29-Flemish indicators for recycling plastics
- A30-International quality label for recycled plastics

7

Bio-economy

- A31-Consultations government and sector on bio-economy
- A32-Valorise / market recuperated nutrients
- A33-List biomass streams / applications
- A34-Identify / stimulate demand for bio-based products
- A35-Consideration for bio-economy in renewable energy policy

8

Metals in a continuous cycle

- A36-Collect even more metals for recycling
- A37-Restrict illegal networks for metal containing waste
- A38-Quality second-hand electric and electronic devices for developing countries / local collection and processing
- A39-Traceability and uniformity of recovered metals
- A40-Research & Development for closing metal cycles

9

New materials

- A41-List research new materials / technologies for closing cycles
- A42-Research and demonstration projects new materials / technologies
- A43-Integrate criteria for SMM into research programmes
- A44-Develop tool to assess impact of nanomaterials
- A45-Strengthen Flemish contribution to European material programmes

Composition steering committee Flanders' Materials Programme

Members:

Henny De Baets
Administrator General OVAM and ViA integrator

Werner Annaert
General Director FEBEM

Lieze Cloots
Policy coordinator Bond Beter Leefmilieu

Bernard De Potter
Administrator General Agentschap Ondernemen

Frans Dieryck
Managing Director essenscia Vlaanderen

Marc Dillen
Director General Vlaamse Confederatie Bouw

Dirk Fransaer
Managing Director VITO

Hugo Geerts
Vice Chief of Cabinet, Minister for the Environment

Erik Mathijs
KU Leuven and promoter-coordinator TRADO
(Steuipunt Transitie voor Duurzame Ontwikkeling)

Dirk Van Melkebeke
Secretary General Department of Economy,
Science and Innovation

Brigitte Mouligneau
Head of Staff of the Government of Flanders and
Process Manager Vlaanderen in Actie

Luc Peeters
Administrator General Vlaams Energie Agentschap

Karel Van Acker
Coordinator KU Leuven Materials Research Centre,
Chairman SuMMa and Plan C

Patrick Van den Bossche
Director metals Agoria

Co-chairs:

Jorn Verbeeck
ViA transition manager
Sustainable Materials Management OVAM

Helen Versluys
ViA transition manager
Sustainable Materials Management OVAM



Maarten Dubois
SuMMa
Manager Support Point
✉ maarten.dubois@kuleuven.be



Jiska Verhulst
Plan C
Network director
✉ jiska@plan-c.eu



Helen Versluys
✉ helen.versluys@ovam.be
OVAM team Flanders'
Materials Programme



Veerle Labeeuw
✉ veerle.labeeuw@ovam.be
OVAM team Flanders'
Materials Programme



Jorn Verbeeck
✉ jorn.verbeeck@ovam.be
OVAM team Flanders'
Materials Programme

In the run-up to 2020, the actions of the Flanders' Materials Programme are key to making significant progress towards achieving a green circular economy in a sustainable and prosperous Flanders. Together with all partners, we also want to play a prominent role in the European materials policy, and draw international attention to the achievements of the Flanders' Materials Programme.

The Flanders' Materials Programme is being realised in cooperation with:

