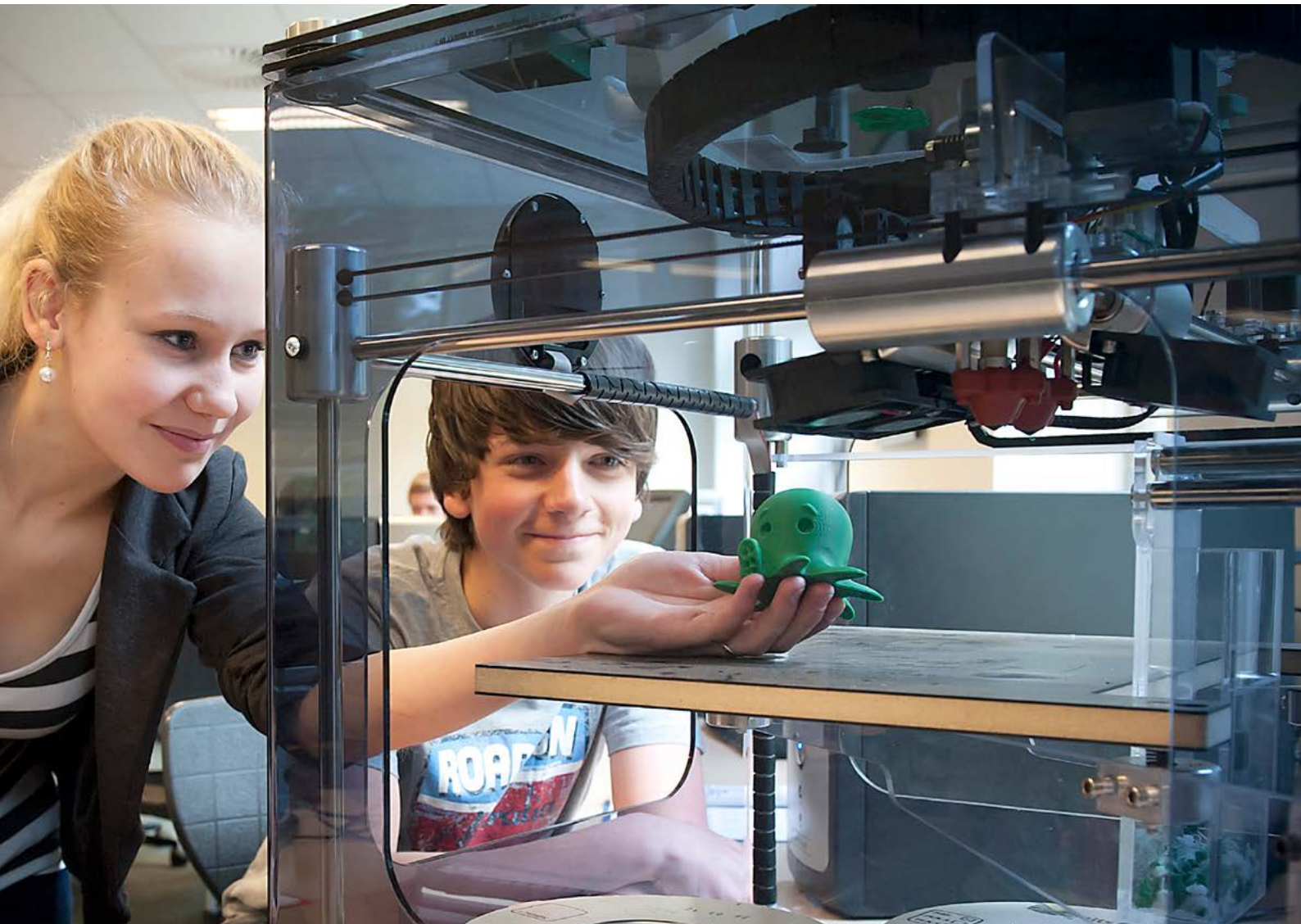
A Circular Economy in the Netherlands by 2050



A Circular Economy in the Netherlands by 2050

Government-wide Programme for a Circular Economy

CIRCULAR ECONOMY

Contents

A Circular Economy in the Netherlands by 2050

The Government-wide programme for a Circular Economy is aimed at developing a circular economy in the Netherlands by 2050. The ambition of the Cabinet is to realise, together with a variety of stakeholders, an (interim) objective of a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030. With this objective for the use of raw materials, the Netherlands sets its ambitions at a level adopted in comparable countries.[1]

The Cabinet wants to outline a vision of a future-proof, sustainable economy for us and for future generations. In concrete terms, this means that by 2050 raw materials will be used and reused efficiently without any harmful emissions into the environment. In case new raw materials are needed, they will be obtained in a sustainable manner and further damage to social and physical living environments and public health will be prevented. Products and materials will be designed in such a way that they can be reused with a minimum loss of value and without harmful emissions entering the environment.

This programme contains the current steps and sets a course for the subsequent steps to be taken on the way to 2050.

With this programme, the Cabinet takes responsibility for setting actions in motion that are aimed at achieving this goal. In addition to its role as market regulator and network partner, the Cabinet wants to promote the transition to a circular economy with its eye on promising prospects and a system approach. Special emphasis will be placed on organising the course to be taken, on management and on everyone's responsibilities.

Through the Government-wide programme, the Cabinet is implementing the Çegerek/Dijkstra motion that requested the Cabinet to come up with an overarching programme for the circular economy.[2] We are meeting this request, as well as various other motions and promises (see Appendix 1), with this programme. It is also our response to the recently adopted advisory report of the Social and Economic Council of the Netherlands (SER)[3] and the advisory report by the Council for the Environment and Infrastructure (Rli).[4]

In developing this programme, we have benefited from the knowledge, insights and suggestions of a range of different parties from society. To accelerate the transition to a fully-fledged circular economy, the efforts of all parties involved are needed and will remain so throughout the entire process. After all, each party – ranging from local governments to social partners and citizens – has unique interventions to offer. The Cabinet will use this programme as the starting point for further cooperation. The Government-wide programme presents the commitment of this Cabinet for the steps to take from now to 2020.

The Minister for the Environment
Sharon A.M. Dijksma

The Minister of Economic Affairs
H.G.J. Kamp

[1] European Environmental Agency: More from less – material resource efficiency in Europe, 2016

[2] Parliamentary documents II, 34 300 XII no. 27

[3] SER, *Werken aan een circulaire economie: geen tijd te verliezen* [Working towards a circular economy: no time to lose], 2016

[4] RLI, *Circulaire economie: van wens naar uitvoering* [Circular economy: from aim to implementation], 2015

1 Promising prospects

1.1 Changes in a broad sense

The circular economy provides an answer to the great challenge of the 21st century, which is to utilise raw materials with much greater efficiency. In order to continue feeding humanity, provide it with the necessary goods and to guarantee people a decent existence, a fundamental change in how we use raw materials is necessary. We are talking about an economy that provides for people's needs without placing an unacceptable burden on the environment and without exhausting natural resources. This challenge will require the introduction of changes in a broad sense. Technological, social and system innovations will have to be implemented.

This transition presents economic opportunities to the Netherlands. It will make the Netherlands less dependent on the import of scarce raw materials and will contribute to a cleaner environment.[5] In a circular economy, we will treat products, materials and resources within the earth's capacity to provide them and in an efficient and socially responsible manner so that future generations can retain access to material prosperity.[6] Many parties in society are already making a contribution to achieving a circular economy and are asking the government to do its part. They recognise that, by being careful about our raw materials, we will be able to continue to live, work and recreate in the future, both here and in other parts of the world, in a healthy and clean environment with a strong economy.

1.2 Unifying theme in policy

The ambition of the Cabinet and the wishes of the House of Representatives are developed in this Government-wide programme for a Circular Economy. The programme, streamlines and coordinates current policy paths. For example, the elaborations of the Biomass Vision for 2030 (*Visie Biomassa 2030*)[7] and the Raw Materials Memorandum (*Grondstoffennotitie*)[8] have been incorporated into this programme. The programme builds on the green growth programmes From Waste to Resources (*Van Afval Naar Grondstof - VANG*), which is aimed at using raw materials in a more sustainable manner, and Biobased Economy, which is focused on the transition from fossil-based raw materials to biomass as a raw material. The goals and ongoing actions of these programmes are reflected in the document at hand. The programme also ties in with the policy to foster a healthy and safe living environment. In addition to creating interconnectivity in the current policy, the programme comprises proposals to accelerate the necessary transition to a circular economy. The programme furthermore expands the approach into areas such as food, construction, finances, education, and the labour market. Finally, the programme indicates what must happen at different scale levels – internationally, nationally, as well as regionally and locally.

1.3 International context

The transition to a circular economy is an international challenge. According to the UN, the increasing consumption brought on by the rapid growth of the middle class world-wide means that, in the last four decades, the amount of raw materials that humans have extracted from the earth has tripled.[9]

At the European level, the European Commission set out an action plan and a package of legislative proposals on 2 December 2015 to move from "waste" to "raw material" and to push the circular economy forward.[10] As President of the European Council, the Netherlands has placed the action plan and the package of legislation on the agenda of

[5] PBL, *Waarom een circulaire economie?* [Why a circular economy?] http://themasites.pbl.nl/circulaire-economie 2016

[6] See footnote 3.

[7] Parliamentary documents II, 33 043, no. 63

[8] Parliamentary documents II, 32 852, no. 1

[9] UNEP IRP, 2017: Global material flows

[10] European Commission, Closing the loop – An EU action plan for the Circular Economy, 2015

the Council. The Circular Economy package of the Commission and the Council's conclusions[11], which were specified in the Environmental Council meeting of 20 June 2016, form an ambitious European policy agenda. The Netherlands wants to contribute to realising this agenda and, to this end, has put forth activities in the Government-wide programme.

UN Sustainable development goals
At the global level, the UN reached agreements last year on new global goals for sustainable development: the *Sustainable Development Goals* (SDGs). Seventeen goals were formulated – and divided into secondary goals – in which the circular economy is addressed in different ways:

- Promote continuing, inclusive and sustainable economic growth, full and productive employment and decent work for everyone (e.g., by decoupling economic growth from environmental degradation);
- Promote sustainable industrialisation and innovation (e.g., by adapting industries in order to make them sustainable, with a focus on greater efficiency in the use of resources and cleaner and environment-friendly technologies and industrial processes);
- Make cities and human settlements inclusive, safe, resilient, and sustainable (e.g., through inclusive and sustainable urban development and building capacity for participative, integrated and sustainable planning);
- Ensure sustainable production and consumption (e.g., reducing global food waste by half, through sustainable government assignments and sustainability education);
- Conserve and make sustainable use of the oceans, the seas, and maritime resources (e.g., by preventing marine litter);
- Protect biodiversity and ecosystems (e.g. by integrating ecosystem and biodiversity values into national and local planning and into development processes).

In the transition to a circular economy, the Netherlands is contributing to the realisation of these Sustainable Development Goals.

1.4 Structure

The reasons why the transition to a circular economy is important and what opportunities it presents to our country are explained in Chapter Two. Chapter Three sets out the ambitions and vision of the Cabinet in more detail, and outlines the transition strategy the Cabinet intends to use to realise this ambition. The chapter also indicates how the programme will be monitored and administered. Chapter Four describes the general interventions that the Cabinet intends to apply.. Finally, Chapter Five describes the ambitions, goals, and efforts for the priorities that will be addressed first.

The SER advisory report
The Cabinet asked the SER for its recommendations to serve as input for this programme. They particularly asked the SER to give its view of how the different parties (including the government and social partners) could better anticipate the transition to a circular economy. They also asked subsidiary questions about promoting innovation, about new business models and about the role of employment.

In its recommendations, the SER endorsed the urgency and necessity of redirecting the character of our economy in the direction of a circular economy and the importance of a Government-wide programme in this area. The SER recommends that the programme be developed into a transition agenda that has concrete goals and transition paths. The SER would like to lend its assistance in this regard. The SER recommends the programme to pursue three paths:

- *anticipate risks, obstacles and opportunities of the transition;*
- *develop a policy framework that anticipates the transitional phase of the supply chain;*
- *develop an integral assessment framework for the choice of priority value chains.*

Finally, the SER advises the Netherlands to become a worldwide leader in certain supply chains.

[11] Council of the European Union, Council conclusions on the EU action plan for the circular economy, June 2016

Low-energy lighting, with re-used materials

‘The world is changing rapidly and requires more low-energy lighting. Population growth and urbanisation generate an increasing demand for resources and energy, which results in climate change. This calls for an alternative approach to the use of our energy sources and materials.’

‘Lighting accounts for a substantial proportion of global power consumption and thus has a significant impact on CO_2 emissions. The good news: the technology to considerably reduce that share in the years ahead is already available. Low-energy, smart LED lighting uses up to 80 percent less power compared to traditional incandescent lamps. Philips Lighting and the UN have the joint ambition to reduce the lighting share in global power consumption (still 15% in 2014) to a maximum of 8 percent by 2030.’

‘Hence the introduction of “Circular Lighting”. A service involving a monthly fee, rather than having customers invest in lighting and maintenance. The modular structure, without an investment threshold and at lower costs, ensures long-term efficiency in the maintenance of the system – which incorporates the latest technology. Thus, we save energy – together with the customer – while making responsible use of resources. In short: replacing “property” by “use”.

‘Replacing property by use.’

‘The collaboration between governments, companies, science, civil society organisations, and consumers is the mainstay of our success. These things start with trust and the shared conviction that we need to take action together in order to keep this planet habitable. The government plays a leading role in this respect: it must encourage innovations and create sufficient scope for incorporating circular principles and thus the re-use of materials into existing legislation.’

Leon Konings

Sustainability Professional Philips Lighting

2 Raw material use: the great challenge of the 21st century

2.1 Necessity

The necessity to strive for a circular economy comes from a concurrence of three developments.

1) **Explosive demand for raw materials**
The most significant issue is the explosive rise in the demand for raw materials during the last century: the Earth's population started using 34 times more materials, 27 times more minerals, 12 times more fossil fuels and 3.6 times more biomass.[12] This increase is illustrated in the figure below. The demand for raw materials will further increase as a result of global population growth (from more than 7 billion to 9 or 10 billion world citizens by 2050), the rapidly growing middle class in emerging economies, and the application of new technologies that require specific raw materials. For example: rare earth metals for batteries, dynamos and electric motors. This growth is not sustainable. Apart from the higher environmental impact, it will also involve increasing damage to and exhaustion of natural capital[13], a loss of biodiversity, a risk of exhausting the supply of raw materials, and climate change. A further increase in the demand for raw materials will thus exacerbate environmental, climate-related, and other sustainability issues.

2) **Dependency on other countries**
Another point is the fact that the Netherlands and Europe are dependent on third countries to a high degree for raw materials. Of the 54 materials[14] that are critical for Europe, 90% must be imported, primarily from China. The Netherlands imports 68% of its raw materials from abroad.[15] This dependency is illustrated in the figure below. The relatively limited availability of these raw materials will lead to (more) geopolitical tensions. That, in turn, will impact on the price of raw materials and the security of supplies, and thus on the stability of the Dutch and European economies. This development can also lead to an increasing disparity in access to raw materials, whereby the poorest population groups will have the greatest disadvantages. This will affect the (non-) achievement of the Sustainable Development Goals (SDGs).

[12] See footnote 3.

[13] Natural capital is the world's stock of natural ecosystems that produce a stream of valuable products and services, now and in the future. It is an extension of the economic notion of capital (manufactured means of production) to include the products and services that the natural environment produces. For example, a forest or a fish population may produce an indefinitely sustainable flow of new trees or fish. Natural capital can also provide services, such as breaking down pollutants, water catchment, and erosion control. The flow of services from ecosystems requires such a system to function properly at full force. (source: Wikipedia)

[14] Scarce raw materials that are essential for certain industrial tasks and whose supply security is low.

[15] CBS, Environmental accounts of the Netherlands, 2011

3) **Interconnectivity with the climate (CO_2 emissions)**
The extraction and use of raw materials has a negative effect not only on the environment and natural capital. It also makes a considerable contribution to the consumption of energy and the emission of CO_2.
The urgency with which we need a circular economy is underlined by the recent Climate Agreement concluded in Paris, in which countries commit themselves to limiting global warming to less than 2 degrees Celsius, with the goal of limiting it to 1.5 degrees C. Between the climate policy and the circular economy, contradictions can also occur. For example, the use of critical metals or biomass for the generation of energy. It is therefore important to monitor the coherence between the two.

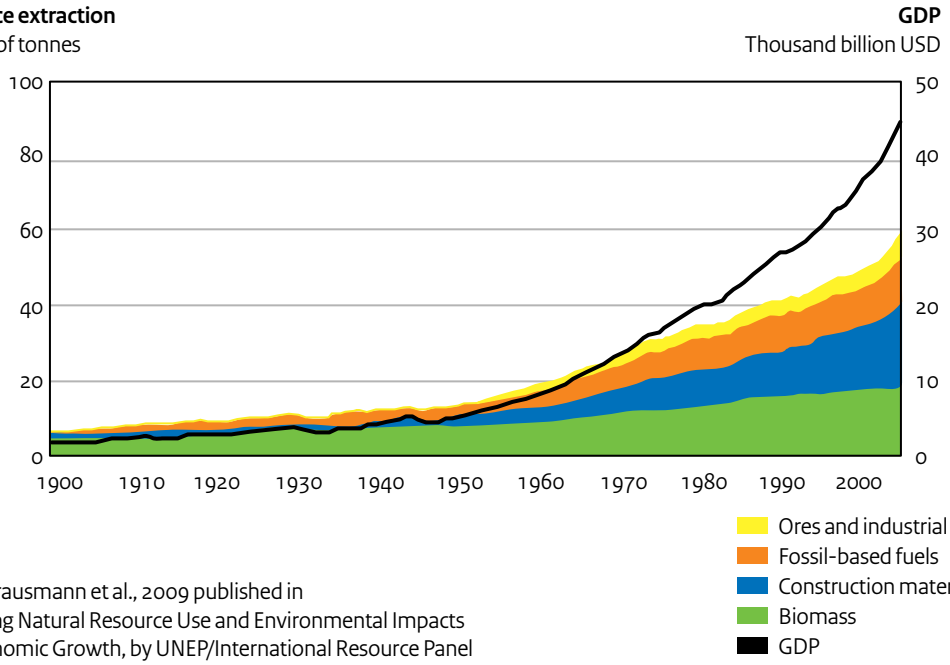
The developments outlined above necessitate a more efficient use of raw materials and their substitution by sustainably produced, renewable, and generally available raw materials. Even if the economy responds to a scarcity of supply, the social and environmental consequences will be high because, in its utilisation of natural capital, humanity has now already far exceeded the capacity of the earth. To continue to feed humanity, supply it with the necessary goods, and to guarantee a decent existence, a fundamentally different handling of raw materials is necessary. This calls for an economy that meets the needs of people without having an unacceptable impact on the environment and without exhausting natural resources. It requires not only a relative decoupling of raw material use from economic growth, but also an absolute decoupling of economic growth from environmental impact.[16] Safeguarding natural capital with a view to supply security and sustainability is a precondition for this. It presents an enormous challenge, but not an impossible one. The circular economy thus provides an answer to the major challenge we face in the 21st century, which is to handle raw materials with much greater efficiency.

2.2 Economic opportunities

Jobs and benefits
The circular economy also presents our country with plenty of (economic) opportunities. Innovation creates opportunities for existing businesses, for newcomers

[16] UNEP International Resource Panel, Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, 2011

Worldwide resource extraction in billions of tonnes, 1900-2005



Source: Krausmann et al., 2009 published in Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, by UNEP/International Resource Panel

(start-ups), and for science. It also generates new export possibilities. Dutch knowledge and expertise provide solutions to scarcity issues elsewhere as well, and can contribute to sustainable development and the expansion of markets.

The circular economy can thus make a significant contribution to the future earning capacity of the Netherlands and Europe. The Netherlands has a good starting position to capitalise on these opportunities: it has a good infrastructure, major ports and airports, and leading businesses. Strong sectors include the chemical industry, the agri-food sector, high-tech systems and materials, logistics, the creative industry, and recycling.

European cooperation can help us to capitalise on this leading position internationally. The Netherlands leads the way when it comes to the biobased economy and the utilisation of Nature Based Solutions that reduce the use of raw materials.

Dutch design is setting trends internationally. We intend to take a leading role for circular design as well.

The Netherlands Organisation for Applied Scientific Research (TNO) has made an initial estimate of the benefits that a circular economy would bring to the Netherlands. Among other things, it states that each year, within the sectors involved in the circular economy, an extra turnover of € 7.3 billion can be generated, which will account for 54,000 jobs in the Netherlands.[17] The use of raw materials can be reduced by approximately 100,000 kilotons (one-fourth of the total annual import of raw materials in the Netherlands).[18] In an exploratory scenario study[19], the Rabobank has estimated that a circular economy can lead to extra growth in GDP ranging from 1.5 billion euros (in a business-as-usual scenario) to 8.4 billion euros (in the most circular economic scenario).

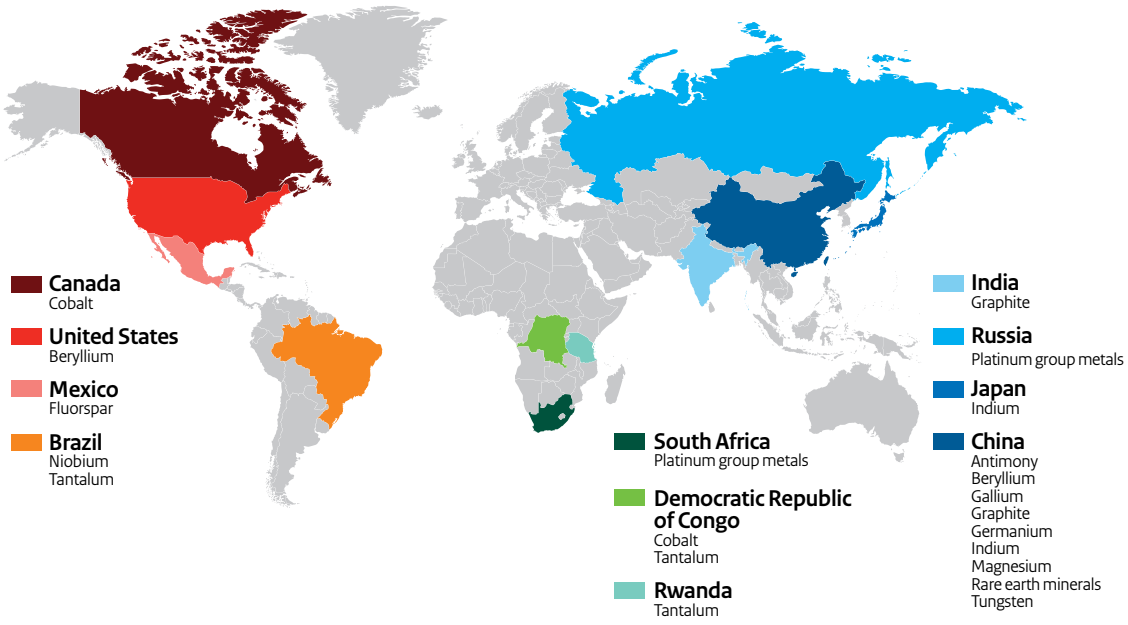
[17] TNO, *Kansen voor een circulaire economie in Nederland* [Opportunities for a circular economy in the Netherlands], 11 June 2013

[18] The TNO calculations should be seen as exploratory and indicative, because not all relevant economic effects have been mapped out. (SER, 2016)

[19] Rabobank, *De potenties van de circulaire economie* [The potential of the circular economy], 2015

Production concentration of critical mineral materials

Europe is dependent on other continents



Source: European Commission, 2010

It is expected that it could bring the European Union economic growth worth 550 billion euros and could produce 2 million new jobs.[20]

In addition to these positive possibilities, it should be said that a circular economy would also lead to declines in some sectors: the closure of loops in industrial sectors could result in a decline in the waste-processing sector.[21]

CO_2 reduction
A more responsible use of raw materials also fits in with the climate policy. The annual emissions released in the Netherlands are close to 200 megatons of CO_{2eq}. An improvement in efficiency in raw material and material value chains could cut this by approximately 17 megatons of CO_2 a year[22] (which is 9% of total Dutch emissions) and thus make a contribution to achieving the climate objectives.

The Circle Economy and Ecofys have explored the contribution that a circular economy could make to achieving the climate goals agreed to in Paris. Based on existing literature and their own calculations, they state that worldwide, by improving material efficiency alone, the current gap between the promised measures for CO_2 reduction and the objective of limiting the maximum rise in temperature to 1.5 degrees can be narrowed by half by 2030.[23]

At the same time, nature-based solutions for climate mitigation and adaptation help to reduce the demand for primary raw materials and promote the transition to circularity. Securing natural capital will thus contribute to solutions in both domains.

The realisation of climate and energy goals will increase the demand for some raw materials for renewable energy technologies (generation, storage, and transport). A circular economy is also important to meeting this demand.

Safe and sound
Substances influence people and nature in different ways. The goal of the policy on substances is to reduce exposure to substances that damage health or harm the functioning of ecosystems. Substances are added to products because they improve the quality of those products, despite their adverse effect.

The circular economy is good for public health and our environment. Designing products in such a way that they can be fully reused and recycled or can be safely released into our environment as ecologic raw materials will also provide social benefits. By preventing pollution with circular products and services, we will save money spent on water purification and, over time, save on the costs of clean-up and health. The fact that this can yield not only an environmental benefit, but also an economic benefit is demonstrated by the Dutch invention of dying textiles with CO_2. This invention is now increasingly being used by textile and shoe producers worldwide. This method replaces water – traditionally used in the dying process – by CO_2. This reduces raw material requirements, cuts back the use of water, energy, and chemicals, and eliminates the cost of purifying wastewater to be released. Compared with the traditional dying methods, this Dutch invention reduces the consumption of energy by approximately 60%. The factories that now use these technologies have reduced their carbon footprint by a quarter and have also reduced the dying time by 40%.

[20] Ellen MacArthur Foundation, Growth Within: a Circular Economy Vision for a Competitive Europe, 2015

[21] PBL Balance of the Living Environment, 2016

[22] As shown by the road maps for Multi-year Agreements on Energy Efficiency (MJA). In the road maps of the service sectors, industrial sectors, and the food industry, the business community sets out the ambitions for a route to climate-neutrality by 2030. RVO, *Routekaarten en Voorstudies* MJA3/MEE.

[23] Ecofys & Circle Economy, Implementing Circular Economy Globally Makes Paris Targets Achievable, 2016

3
Changing course

The ambition of the Cabinet is to realise a circular economy by 2050. This means that the preservation of natural capital will be taken as a starting point in the economic system, such that renewable and generally available raw materials are used wherever possible. To that end, raw materials are optimally deployed and (re-)used without any risks for health and the environment, and primary raw materials, insofar as they are still needed, are extracted in a sustainable manner. In 2050 the circular economy must be a reality. This will continue to give future generations access to material prosperity. The ambition of the Cabinet is to realise, together with a variety of stakeholders, an (interim) objective of a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030. With this objective for the use of raw materials, the Netherlands will raise its ambitions to meet the level adopted in comparable countries.[24] By 2020, the Cabinet will have taken a major step in accelerating the pace of the transition to a circular economy.

In this chapter, the Cabinet explains its vision, strategy and goals for achieving this ambition.

3.1 Vision

The transition involves a shift from "take, make and waste" to a system that uses as few new raw materials as possible. The basic idea behind the transition is shown in the diagram below. In the diagram, three economic models are identified, each of which has a different starting point with respect to its approach to the use of raw materials: the linear economy, the reuse economy and the circular economy.[25]

In many sectors, the Dutch economy is already on the way to becoming a circular economy and can primarily be classed as a reuse economy: the amount of waste is falling as the economy grows and waste is being reused to an ever-increasing degree. Although the need for raw materials is being stemmed, the capacity of the earth to provide them is still being exceeded and the supply security of materials and raw materials is decreasing.

The Netherlands Environmental Assessment Agency (PBL) notes that: "The idea of the circular economy as a fully closed system is a mobilising ideal image. The use of primary raw materials and the creation of residual streams can probably never be completely avoided. This has to do with those raw materials that are necessary for countries that are still building up their infrastructure, and with the fact that some of the use of raw materials is inherently linear, e.g., for energy and food."[26]

There are also limits to the reduction of material requirements with continual global economic growth.[27] This underpins the necessity of continuing to focus on the sustainable acquisition of raw materials and on the preservation of our natural capital in order to provide future generations with raw materials as well.

Although the circle will never be entirely closed and absolute decoupling at the global level seems to be feasible only in the very long term, this programme is focused on this decoupling of growth and material use, and on a system in which the sustainable extraction of raw materials and the preservation of natural capital are guaranteed.

3.2 Strategic goals

The transition to a circular economy requires a transformation in the way we use raw materials. To transform the Dutch economy into a circular economy at an accelerated pace, three strategic goals have been formulated in the Government-wide programme:

[24] See footnote 1.

[25] Based on the EU consultation Circular Economy for member states, sent to the House of Representatives and the European Commission on 19 October 2015 (appendix to Parliamentary documents II, 22 112, no. 2009) https://zoek.officielebekendmakingen.nl/blg-602632.

[26] See footnote 5.

[27] Prof. Dr Arnold Tukker, *In kringetjes vooruit*. De circulaire economie als recept voor duurzaamheid [Progressing in circles. The circular economy as a recipe for sustainability], 2016

Skateboarding on plastic bottle caps

‘Plastic Whale, the organisation that retrieves plastic from rivers and canals, and uses it to build nice boats to fish for more plastic, came up with the idea of making skateboards out of plastic bottle caps. We succeeded after a lot of research and tests, in collaboration with students from Amsterdam University of Applied Sciences. This is how the WasteBoards came into being. ‘

‘This summer we attended several dance and music festivals with a cargo container, converted into a mobile bakery. By arranging 750 different-coloured and different-sized bottle caps in a particular pattern in the mould, we created beautiful and unique WasteBoards. It is not only cool to watch these boards being made; it is also a very good way to raise awareness among the festival crowd: waste can be a valuable resource for beautiful products.’

‘As a former professional skater, I know what requirements a good skateboard must meet. Contributing to resolving the plastic waste issue is inspiring and gratifying. That is why I quit my job in order to fully focus on WasteBoards.’

‘... waste can be a valuable resource for beautiful products.’

‘Our mission is to tackle plastic waste at the global level as well. And in addition to encouraging local activity and employment opportunities, we aim to set up mobile board bakeries across the globe, anywhere where there is a lot of waste. We have already established the first contacts in Manilla, Rio, and Mumbai. We are raising awareness and encouraging local entrepreneurial spirit in a positive and relevant manner. Our ultimate goal, of course, is to get rid of all plastic waste in the world; *we’re in business to go out of business!*’

Jonathan Morrison
Chef WasteBoards Bakery

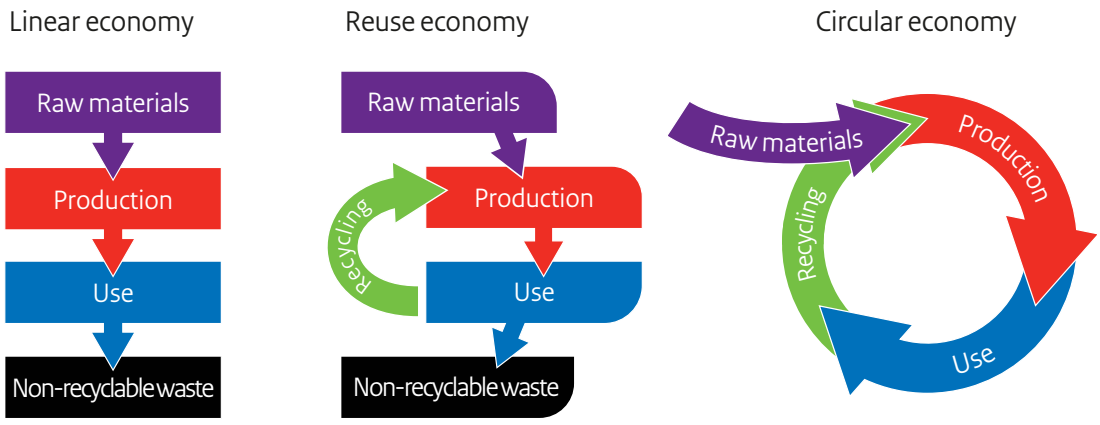
1 **Raw materials in existing supply chains are utilised in a high-quality manner.**
This increase in efficiency can lead to a decrease in the demand for raw materials in existing supply chains.

2 **In cases in which new raw materials are needed, fossil-based, critical and non-sustainably produced raw materials are replaced by sustainably produced, renewable, and generally available raw materials.**
Apart from biomass, generally available raw materials are the raw materials that nature needs for life (iron, silicon, carbon, magnesium, sodium, potassium, calcium, nitrogen, oxygen, phosphorus, sulphur, hydrogen).
This preserves our natural capital and enables us to make our economy more future-proof and less dependent on (the import of) fossil sources.

3 **We develop new production methods, design new products and organise areas differently. We also promote new ways of consumption.**
This leads to different supply chains that give additional impetus to the desired reduction, replacement and utilisation.

As these goals are achieved, the manner in which material streams are used and organised in the Dutch economy will radically change over time.

From a linear to a circular economy



From a linear to a circular economy

- In a linear economy, raw materials are extracted from the earth, used and discarded: "take-make-waste".
  At best, this economy leads to the relative decoupling of economic growth from the use of natural resources.
- In the reuse economy, many non-recyclable materials are used again (cascading, repair/maintenance, reuse, remanufacturing, recycling).
  At best, this reuse economy leads in part to an absolute decoupling of economic growth from the use of natural resources and from emissions: the demand for natural resources and the emissions decrease as the economy grows.
- The ideal picture is a circular economy in which raw materials are never depleted. This economy can be structured so that there is a positive coupling between economic growth and the growth of natural resources ("negative" emissions / positive footprints). In a circular economy, value chains will be organised differently.

“Easy to repair” as a standard requirement

‘In order to continue to meet our demand in the future, we need to convert to a circular system, in which resources are preserved and continually re-used. Wastage of valuable products and materials grieves me: I think that’s a shame. I intend to make an effort to reduce the amount of waste we collectively produce. By encouraging everyone to repair things or have them repaired when they are broken, and by encouraging manufacturers to improve the repairability of their products. That is why I devised the Repair Café.

Manufacturers will only start making products that can be repaired more easily if this is financially attractive for them. This requires support from the government. For example, by extending a manufacturer’s responsibility for the proper functioning of a product. If a producer is required to give, for example, a five-year rather than a two-year guarantee for his products, it will be in his own interest to ensure that the item will not break down within five years. And that it can be easily repaired if it should break down anyway.

We hope that in five years’ time there will be more volunteer groups organising a Repair Café in their own neighbourhood once a month or once a week. We also expect that within five years “easy to repair” will be a standard requirement to be met by product designs.

‘Wastage of valuable products and materials grieves me: I think that’s a shame.’

The Repair Café foundation is a not-for-profit organisation receiving financial support from a number of private funds. Our funding for the future is as yet insecure. It would be nice if the government would also support us, in order to enable us to continue our work. There is still so much work to be done.’

Martine Postma

Repair Café foundation

3.3 Generic Policy (for change): removing obstacles

Changing the economic structure
In order to change the Dutch economy to a circular economy at an accelerated pace, both the economic structure and the material streams within it must be influenced and changed. This requires technical, social and systems innovations. The models described in paragraph 3.2 constitute different phases on the way to a circular economy, but in practice these phases often exist side by side. This may differ from one specific material value chain to the next. For this reason, made-to-measure work and proper timing are important. In some situations, we must build on the strength of the linear economy to capitalise on economic advantages of scale and, at the same time, limit negative external effects. In other situations, we must strengthen the reuse economy by using materials and products in a more intelligent fashion and by making more efficient use of facilities (sharing economy). Parallel to this, the challenge is to consciously and collectively create new circular forms of consumption and production, such as making the shift from possessing to using, the 3D printing of food, or the use of CO_2 as a raw material.

The transition path to be chosen always requires an integral consideration in which not only economic and environmental aspects are taken into account, but also other aspects of welfare.

International approach necessary
The transition to a circular economy is by definition international in nature because economies are becoming increasingly intertwined and the Dutch economy is highly dependent on international streams of raw materials. Our businesses operate increasingly at a European and global level. The circular economy can therefore not successfully develop outside the European and international context. This is especially true for European cooperation in the area of legislation and regulations, and for strengthening the market for secondary and renewable raw materials. Yet in a wider context, too, international cooperation is necessary to close supply chain loops, to internalise environmental costs and achieve a level playing field, to prevent evasive behaviour, and to safeguard supply security. Safeguarding a level playing field, in particular, as well as preventing evasive behaviour, requires a balanced assessment between what is nationally desirable and what is internationally feasible.

Obstacles for a circular economy
This transition will not come about on its own. The Rli and SER advisory reports indicate the obstacles that stand in the way. The most significant obstacles are summarised below:

Regulations
The current regulations still insufficiently target the transition. This is because the focus is still too much aimed at countering the damaging effects of waste and emissions, and too little at utilising the value of the raw materials.

External effects are not internalised
Sustainable products are often more expensive than non-sustainable alternatives. This is because damage to the environment and public health is still insufficiently reflected in the price of raw materials and thus in the price of products.

Lack of knowledge for technological, social and system innovations
Both entrepreneurs and financers are insufficiently aware of the possibilities presented by new circular business models. Knowledge is necessary to redesign production processes, so that raw materials can be optimally reused. Knowledge is also necessary for the development of sustainable alternative materials for production.

Non-circular behaviour among citizens and professionals
This pertains to breaking through ingrained, non-circular behaviour patterns among consumers, producers, and other organisations.

Coordination problem in supply chains
Parties in the supply chain must jointly tackle material streams, beginning with product design and the choice of raw material, and ending with recovering the used materials. This currently happens to an insufficient degree.

Vested interests and investments made
These impede a transition, on the one hand, because newcomers lag behind in market penetration, and, on the other, because investments made can be exploited at a relatively low cost price. Attention must also be paid to the position of employees in sectors that are going through transition.

Limited influence in the international playing field
Due to the great differences between countries, and the interests of countries that export raw materials, the concept of a circular economy is still not a widely shared ambition. Inside the EU and outside it, the Netherlands is “only” one of the players.

Five interventions
The aforementioned obstacles make it difficult for businesses, consumers and governments to take on their role in the transition to a circular economy. Some of these obstacles can be removed by the government, in concert with social partners. Through targeted interventions, they stimulate the desired transition.

The Cabinet has designated five interventions in which the government, in its role or authority, influences the transition:

- Fostering legislation and regulations;
- Intelligent market incentives;
- Financing;
- Knowledge and innovation;
- International cooperation.

Good and mutual cooperation that is focused on interconnectivity and timing can reinforce these interventions. If all parties in a specific sector or supply chain decide to act in concert in order to counteract negative effects, the transition can be accelerated. The phase in the transition that specific supply chains find themselves in also plays an important role in choosing the most appropriate type of intervention.[28]

These five interventions will be further elaborated in Chapter Four.

3.4 Cooperation

Owing to its complexity, the transition requires new approaches. Technological innovations are not sufficient to change the system of the economy and the relationships between market parties. Issues run straight across business sectors and various scale levels. In designing a product, for example, the period following the time when the product is used must be taken into account. This is why parties need each other. It is important for public and private parties to seek possibilities to implement technological, social and system innovations from a shared vision and in partnership. In their own supply chain or across sectors. Between companies, knowledge institutions and NGOs: at the local, regional, national and international levels. Step by step. This joint transition requires a government that not only acts as a market regulator, but also – when necessary – acts as a director, steering the course and, as a network partner, showing its commitment and actively cooperating with various stakeholders in product value chains, in sectors and at various scale levels from the position of its own added value.

Examples of instances when the government has acted in such roles are the Green Deals that have been concluded, as well as other networks such as the value chain agreements for the phosphate and plastic cycles, and the cooperation in the approach taken to packaging. These examples show that such cooperation can lead to accelerated, tangible social results.

Scale levels

Through cooperation at different scale levels the Cabinet wants to encourage initiatives at the national and international levels, as well as initiatives at the local and regional levels to reinforce one another. The Social and Economic Council of the Netherlands (SER) also stresses the importance of this cooperation.

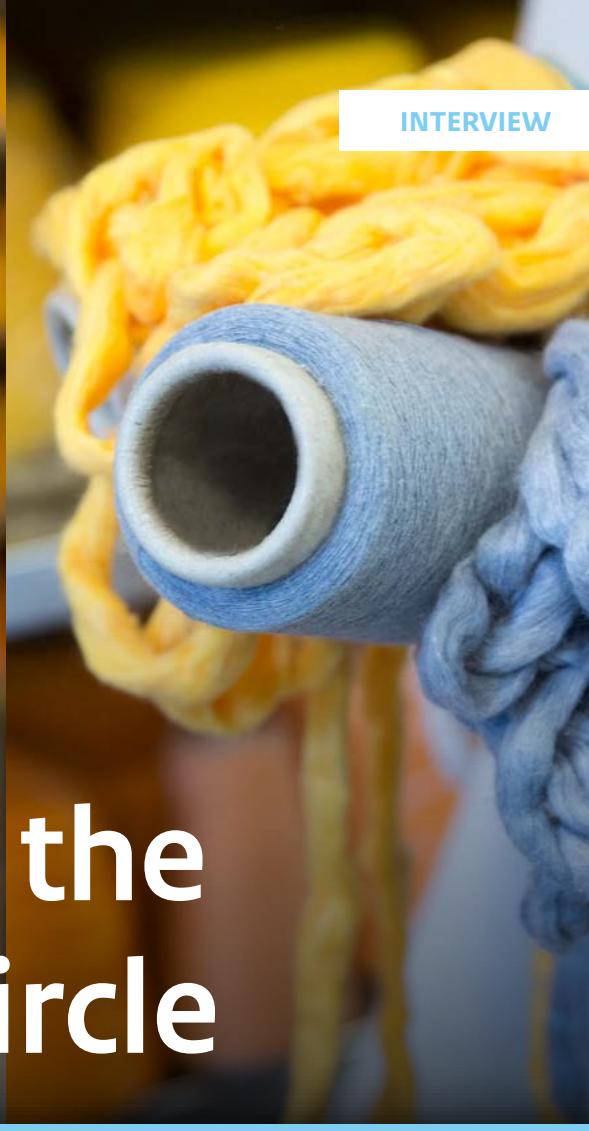
The first City Deal and the first local value chain agreements for the circular economy have been concluded, in which regional governments, companies and knowledge institutes jointly take initiatives, and in which the national government collects their learning experiences and actively contributes to the development of indicators for monitoring progress. This holds great potential due to the additional management capacity of the local and regional authorities, the close proximity of parties, the direct relationship with the labour market and consumers, and because "loop closure" of some material streams is effectively achieved at the regional level. City Deals are a good instrument for forming coalitions with cities to put the circular economy programme into practice through the layers of government with related government efforts.

Spatial planning solutions

The Netherlands Environmental Assessment Agency (PBL) indicates that spatial planning solutions can also contribute to the transition to a circular economy. This also comprises the connection with the natural capital policy field. Through business park management and urban planning, companies in industrial parks can make use of one another's materials and residual streams, as shown in Park20|20 in Haarlemmermeer. At the local level, loops are then closed. Regional spatial planning policy offers greater scope for supporting circular activities.

The Cabinet aims to develop projects with pioneering cities for the adaptation of local area planning, such as disconnecting rainwater collection in new construction and installing green roofs.

[28] In transition literature, each large social transition can be divided into four phases: a development phase with pioneers and fundamental research, a start-up phase with new applications and experiments, an acceleration phase in which existing actors and systems are put under considerable pressure by seasoned new actors and systems, and a stabilisation phase in which the work method is institutionalised.



Breaking out of the vicious textile circle

‘Textile production takes a considerable toll on the environment. At the same time, a lot of clothing is discarded because they are considered no longer of use. Reblend (2013) develops, in collaboration with designers, manufacturers, and brands, yarn made of 100% used textile, and processes this into clothing and upholstery fabrics.’

‘Our aim is to establish ourselves within five years as a brand marketing innovative collections ...’

‘There is an extreme imbalance between the short life span of textiles and the permanent impact these materials have. We use mainly textiles that are no longer suitable for wear (70%) and process them in a smart process – without the use of water or additional chemicals, which yields yarn and textiles with a considerably better ecological footprint!’

‘We are the first company in the Netherlands to examine the production of recycled textile, in interconnection with supply and demand. As a result, we are often held back by the fact that we are still producing on a small-scale level. By way of comparison: we have currently produced 6000 kg of textile, which is nothing compared to the 300.000 to 400.000 kg produced annually by major producers. Government tender procedures, for example, in the event of sustainable procurement, also remain difficult for us. We derive our added value from other aspects.’

‘Our aim is to establish ourselves within five years as a brand marketing innovative collections, made in co-creation with major and small labels: not creating a hallmark, putting up machinery, or spinning our own yarn, but rather forming an umbrella label inter-connecting sustainable development, projects, and processes: “re-think, re-use & re-connect”. Actually breaking out of the vicious circle. That is our intention.’

Anita de Wit
co-founder of Reblend

INTERVIEW

100% zero emissions with quiet and efficient drive

‘With our buses division, we have been pursuing smart and sustainable mobility for quite a while, by manufacturing electric public transport buses. Initially in the form of pilot projects, but in recent years we have been the first to upscale to major projects in Western Europe. Meanwhile, we have various basic vehicles. This year, our hydrogen buses will take to the road in Eindhoven.

Next year, we will introduce our first electric truck, initially a fully electric 37-ton tractor with a range of 100 to 120 km, mainly intended for urban distribution and shop supply deliveries. At a later date, a hydrogen version will become available with a range of 350 to 400 km. In addition, we will bring out an electric delivery van. All vehicles are 100% zero emission and equipped with a quiet and efficient electric drive.

‘Next year, we will introduce our first electric truck.’

In addition to these electric vehicles in the Netherlands and Belgium, we are focusing on other issues that are essential to enabling electric transport. For example, VDL will be able to supply charging infrastructure solutions through its partners. We are also working on energy storage (buffering, peak shaving, load shedding) in large-scale battery systems and related smart grid solutions. Eventually, these energy storage systems could be provided with used battery units from electric vehicles. Furthermore, we have plans to bring battery assembly to the Netherlands, because of the growing demand for large battery units for our own vehicles, energy storage systems, and delivery to third parties, and also on account of increasing delivery times and transport costs of batteries from Asia. In addition, command of battery technology and battery systems for heavy electric transport is crucial to retaining know-how and jobs in the Netherlands.’

Menno Kleingeld
CEO, VDL Group

Spatial economic development

For the development of a number of circular economic hubs in the north wing of the Randstad (Port of Amsterdam, Schiphol Airport, Aalsmeer, AMS-IX), a collaboration was recently established between the national government and regional authorities under the name of Westas or West Axis. The national government and regional authorities in the north and south wings of the Randstad and Brainport Eindhoven signed a declaration of intent on 9 June 2016 to establish a spatial economic development strategy (ruimtelijk-economische ontwikkelingstrategie, REOS).[29] This collective strategy is intended to help these regions to remain internationally competitive.

Digitalisation

The commitment to digitalise the economy is important.[30] Through digitalisation, everything becomes connected, such as intelligent infrastructure, energy networks, the "Internet of things", and social networks. Digital platforms and developments such as *Blockchain* make a sharing economy possible. Further digitalisation and the development of big data will enable a much more accurate, local, and efficient organisation of processes and systems. This is demonstrated, for instance, by the "smart cities, industry, and mobility" developments, resulting in a much more efficient use of raw materials and energy.

Toolbox for the regional level

The Cabinet will support a circular economy through spatial economic policy that fits in with current initiatives. To optimally deploy the strength of partnerships at various scale levels within the Netherlands in the transition to the circular economy, an integrated toolbox has been developed that will actively be offered to stakeholders at the regional level.

Change in transport

It is generally expected that the circular economy will change transport patterns and the scope of these patterns in the Netherlands, due to developments such as the sourcing of products and raw materials from the near vicinity (near sourcing), the sharing economy, changing waste streams, a decrease in the transit of primary raw materials, the increasing importance of service and reverse logistics, and sustainable product value chain networks at different scale levels. The regional network *Noord4bio* is an example of this. This will have consequences for major ports and airports, transhipment points, industrial sites, and other modalities in the infrastructure. For example, the Port of Rotterdam is preparing itself to become an international hub for biomass.

[29] www.centre-for-sustainability.nl/uploads/cfs/attachments/Oratie%20Tukker.pdf

[30] The Digital Agenda, Parliamentary document 2016D28621, 5 July 2016

Local and regional circular initiatives

Together with local governments and entrepreneurs, the Cabinet intends to expand the number of repair and recycling initiatives.

The National Sustainability Network (*Rijksduurzaamheids-netwerk*), with 1,600 members from inside and outside the government, will be deployed to support regional business cases and to make new connections between parties at the municipal, provincial and national levels.

3.5 Specific policy (for change): approach for each sector or value chain

In addition to a generic approach, the transition to a circular economy calls for a change strategy specifically geared to each sector or raw materials value chain[31], i.e., to each priority. The programme is focused on five priorities that are important for the Dutch economy, that have a large impact on the environment, in which there is already considerable social energy for the transition to a circular economy, and that fit in with the priorities of the European Commission. The five priorities are:

- Biomass and food
- Plastics
- Manufacturing industry
- Construction sector
- Consumer goods

The Cabinet supports the SER recommendations and has the ambition of making the Netherlands the international leader in the area of the circular economy in these sectors and supply chains by 2020.

The strategic goals have been rendered operational for each priority in the form of concrete objectives. In this way, the Cabinet has taken the first step for the transition agendas and transition paths proposed by the SER. Each priority has its own dynamics, stakeholders, regulations, and transition phase. This is why the approach is differentiated for each priority.

Chapter Five sets out the five priorities in more detail.

Circular economy agreement and transition agenda per priority

With the approach outlined in this chapter, the Cabinet is taking the initiative to reach an agreement on circular economy (*grondstoffenakkoord*), together with the social partners, before for the end of this year. In this circular economy agreement, the Cabinet aims to share the

[31] See footnote 3.

ambitions that have been recorded in the Government-wide programme with the partners, and generally explore the bottlenecks that obstruct its realisation, including the interim goal of 2030, while concurrently exploring relevant solutions. The Government-wide programme presents the efforts by the Cabinet in support of the agreement.

The circular economy agreement will be further developed for each priority in transition agendas, in cooperation with the relevant businesses and other social stakeholders. In these agendas, concrete and accountable agreements will be made on the way in which the parties involved will contribute to achieving the aforementioned goals. The objective is to complete these transition agendas before the summer of 2017. This Government-wide Programme explains the actions envisioned by the Cabinet. In this way, the Cabinet will substantiate the motion put forth by Çegerek/Van Veldhoven, which requested to reach an agreement on circular economy.[32]

Supporting partnerships in networks
Cooperation within and between supply chains can be improved. The same is true for cooperation on a regional scale. Often the infrastructure for this is missing or is insufficient, causing the cooperation to stall before it really gets off the ground. This is why the Cabinet intends to provide these types of networks with a little temporary support through a value chain cooperation project subsidy. The subsidy involves a limited financial contribution for, e.g., a facilitator that helps parties (including small and mid-sized businesses) to gather the correct knowledge and to exchange knowledge within and between networks in order to quickly achieve concrete, shared results.

3.6 Direction and monitoring

For a good implementation of the programme, a steering committee will be set up, made up of the national government ministries involved and various stakeholders. This committee will direct an innovative implementation of the programme. A project group in which the same parties are represented will operationalise the implementation. Cross-sector steering of the transition agendas will ensure that relationships between the priorities are addressed, in order to prevent a compartmentalised approach to each priority.

Gradually, the government-wide programme, and particularly the development of the priorities in transition agendas, will be monitored and, when necessary, adjusted. This will be effected on the basis of the transition phase, the scope of the goal, and the experiences gained. During this process, consideration will also be given to any other priorities to be tackled, and to verify whether the organisation by sectors and relevant supply chains needs to be adjusted. The process will tie in with the monitoring method and associated indicators being developed by the EU.

The Cabinet will inform the House of Representatives annually via a progress report. This report will discuss both the performance of the actions and the progress of the transition. This monitoring process can capitalise on the experience gained with the monitoring of Green Growth (*Groene Groei*), the From Waste to Resources (*VANG*) programme, the Smart Regulation (*Ruimte in Regels*) programme, energy innovation, Green Deals, Biobased Economy, Natural Capital accounting, and City Deals.

To be able to measure what results have been achieved in all of these forms of cooperation in a uniform manner, the Cabinet is taking the initiative of producing a measurement protocol. This will also enable the progress made in the transition to be measured in a consistent manner. Measurable results will thus constitute the basis for further action. This measurement protocol will be developed in cooperation with the Netherlands Environmental Assessment Agency (PBL) and Utrecht University.

[32] Parliamentary documents II, 34 300XII, nr. 37.

4 Interventions

To achieve these ambitions and to create good conditions for the intended transition, the Cabinet will deploy five instruments for the priority sectors, wherever such is necessary and useful:

1. Fostering legislation and regulations;
2. Intelligent market incentives;
3. Financing;
4. Knowledge and innovation;
5. International cooperation.

4.1 Fostering legislation and regulations

Legislation and regulations can promote, as well as hamper innovation. Although the goal is to remove regulatory barriers, the primary objective is to develop legal frameworks that encourage innovation, promote dynamics, and support investments.[33] To remove barriers and to provide room in the legislation to benefit a circular economy is in line with the Cabinet policy of establishing future-proof legislation that makes it possible to innovate and anticipate societal initiatives.[34]

4.1.1 Barriers and opportunities

Legislation is still often based on current technology or operate from the basis of linear insights. Legal frameworks organise the market based on classical production sectors (foodstuffs, feed, cosmetics, chemicals). Collaboration between production value chains and the use of residual waste flows from other value chains will more likely result currently to the build-up of obligations and compliance costs, rather than to integrated assessments in the enforcement chain. For innovative solutions, the legislation should provide room by applying the principle of equivalent solutions when new technologies are used and to create room to experiment without any imprudent risks being taken. That said, legislation can also serve as a driver for innovation. By gradually scaling up the standards to establish, say, full circularity with respect to emissions to land, air and water, companies will be forced to innovate and adopt circular substances and technologies.

Definition of waste

Because residual flows that were seen as waste in the past are more and more being used as raw material, we need a more targeted and coherent conceptual framework for waste: when is it waste or not, when is it a by-product and when is it end-of-waste? A more critical assessment of the label "waste" is therefore necessary not only for residual waste flows, but also for returned products (such as products bound for repair, disassembly, or recycling).

International policy on substances (such as REACH, Stockholm Convention)

The guiding principle of the policy on waste is to deal with raw materials as efficiently as possible by, inter alia, aiming to recycle products and materials. The policy on substances is intended to phase out so-called harmful substances in products and materials. In the transition to a circular economy, it is important to strike the right balance between recycling raw materials, on the one hand, and preventing the spread of harmful substances, on the other. Sometimes products and materials that contain harmful substances can be safely recycled by taking into account their intended use in the future. In some cases, current legislation could render safe recycling impossible, even though this can reduce the environmental impact enormously by saving raw materials and reducing CO_2 emissions. For this reason, the Cabinet is aiming to establish an assessment framework for deciding, on a case-by-case basis, whether recycling or removal is the best option.

[33] This serves to respond to the Dik-Faber and Çegerek motion (Parliamentary documents II, 33 043, no. 61 (was 57)) in which the government is asked to come up with a proposal for removing barriers in laws and regulations that thwart the realisation of a circular economy.

[34] Cf. the Parliamentary memorandum *Werken aan toekomstbestendige wetgeving en een toekomstbestendig wetgevingsproces* [Working on future-proof legislation and a future-proof legislative procedure] of 6 July 2016, Parliamentary documents I, 33 009, no. 30, no. E, Parliamentary documents II, 33 009, no. 30.

EC Regulation on shipments of waste

The administrative obligations and financial guarantee that the EU Waste shipment regulation requires for the cross-border transport of waste are reason enough for many companies to decline to offer or use waste substances as raw materials. Particularly in a country of transhipments like the Netherlands, companies tend to have to deal with trading partners abroad when it comes to the purchase and sale of raw materials. This bottleneck can be solved by removing a substance's waste status, when it is unnecessary, or by providing made-to-measure assessment when implementing the Regulation.

Added value of the sharing economy is significant

A more efficient utilisation of existing (capital) goods could reduce the intensity of raw material use and the environmental impact. In this way, the sharing economy and the sale of a product as a service can contribute to the circular economy. Easy access to a car when it is needed, for instance, can convince people to get rid of their (second) car. The potential added value of shared use for the Dutch economy is significant.[35] An underlying trend for the development of a sharing economy is the shift that takes place from the possession of goods to the possibility of using these goods without owning them. An economy that uses fewer raw materials can still meet the demands of consumers, or even more. Consider services such as Spotify: listening to music anywhere without CDs. Or Peerby, an app that enables you to borrow something from someone in your neighbourhood. Why buy a new electric drill when you can borrow one from a neighbour that is not using his via an app? After all, the hole in the wall, that is what counts. Of course, possible negative (rebound) effects will have to be taken into account.

For shared use and providing a product as a service, there are challenges to face with respect to legislation, incentive arrangements, and tax frameworks. Uncertainty about the application of legislation may hamper the development of such business cases.

Implementation and enforcement

Licensing authorities and inspectors are responsible for applying the rules in a changing environment. Licensing authorities and inspectors need new knowledge and new work methods to utilise the existing room for manoeuvre in laws and regulations for upcoming circular initiatives.

Integration of policy and management in the chemical and materials sectors

The benefit to the climate resulting from the use of biomass and/or recycled raw materials in chemicals and materials currently counts only to a very limited degree towards achieving the emission reduction goals. There is a specific policy for the promotion of bioenergy and biofuels, but hardly any policy for the chemical and material sectors. The business case of many biobased initiatives in relation to fossil-based alternatives is negative, which makes it very difficult for producers of renewable products and materials to launch a market introduction and scale-up. The Netherlands is aiming to reduce CO_2 in all sectors. That is why we are arguing at the EU level for policy that will promote the reduction of CO_2 in the chemical and materials sectors.

4.1.2 Ongoing efforts

Smart Regulation programme

The Smart Regulation programme (*Ruimte in Regels*) runs up to 2020. In this programme, the government cooperates with entrepreneurs to look for greater room within current legislation to promote sustainable innovations. The programme was initiated following indications from entrepreneurs who felt restricted by legislation when planning innovative investments. The Smart Regulation programme delves into the nature and background of these barriers, brings the relevant parties together and helps them to search for solutions. Up to now, more than 80 barriers have been removed, which has made it easier for companies to run their businesses in a circular fashion.
These cases have helped identify the barriers described in paragraph 4.1.1. This programme will continue in the years to come. In the period running up to 2020, the Cabinet will strive to remove at least another 80 barriers.

Application of the concepts of "waste", by-product" and "end-of-waste"

Capitalising on the possibilities for secondary raw materials to shed the label of "waste" led to two ministerial regulations in 2015. One is related to the end-of-waste status of recycling granulate (stony material) and the other concerns the conditions for the by-product status, tailored to the substance glycerine. Since then, efforts have shifted to encouraging companies and governments to start applying the concepts of "by-product" and "end-of-waste" themselves. This is accomplished by providing information and through discussions in meetings, as well as by means of so-called legal rulings (opinions of the Ministry of Infrastructure and the Environment concerning a specific case given at the request of a company). This policy will be given a significant boost in 2017 through an explanation of the concepts of "waste", "by-product" and "end-of-waste" in the third National Waste Management Plan (LAP3).

[35] See footnote 17.

Dealing with issues surrounding the definition of waste

In considering the change to the Waste Framework Directive[36], the Netherlands is arguing for clarification of the definition of waste and enforcement of the regulation for by-products and end-of-waste. The Netherlands is also urging that the European Commission plays a facilitating role in issues surrounding the definition of waste and cooperation between the EU member states, as well as the transition to a circular economy. This provides opportunities over the coming years to further refine the definition of waste and thus also tailor the EU Waste Shipment Regulation to circular activities.

Harmful substances and recycling policy on the international agenda

Internationally, within an EU framework (European Council conclusions, REACH committees) and within the framework of the Stockholm Convention (persistent organic pollutants) and the Basel Convention (how subsequently to deal with the persistent organic pollutants already in circulation), the Cabinet has placed the interface between the policy on substances and the recycling policy firmly on the agenda. In this area, the Netherlands continually points out the fact that the large volume of material containing harmful substances that is in circulation in society cannot and does not, in practice, all need to be taken to waste incineration. In some cases, it is better to focus on prevention and, with respect to the substances already in circulation, on safe recycling methods and applications, which will reduce the environmental impact through savings achieved in raw materials and the reduction of CO_2 emissions. At the review of REACH in 2018, the Cabinet especially wants to focus on preventing the use of harmful substances and on recycling materials in circulation in cases in which this would not be harmful.

"*North Sea Resources Roundabout*" Green Deal

On 3 March 2016, the International Green Deal "*North Sea Resources Roundabout*" was signed. This is a public-private partnership initiated by the Netherlands, comprising the United Kingdom, Flanders, France and the European Commission. The goal of the partnership is to facilitate the use and cross-border trade of recycled material, e.g., by harmonising quality standards and waste definitions, as well as adopting a tailored approach to the implementation of the EU Waste Shipment Regulation. For three material streams – compost, PVC, and bottom ashes – barriers and potential solutions are being identified. A fourth stream will soon follow: struvite (phosphate from sewage). In this way, barriers present in regulations can be removed without the need for EU-wide measures. The Cabinet is exploring possibilities for new international Green Deals.

[36] COM (2015)595

4.1.3 Planned actions

Promoting circular revenue models

Current regulations are not always geared to new relationships between those who supply and those who buy products and services. This can be seen in initiatives involving the provision of services rather than products. The Cabinet intends to provide greater clarity on related tax and liability aspects by analysing practical examples and, on this basis, review whether amendment of the regulations is necessary and desirable.

Room to experiment

In follow-up to the European Council conclusions and the recommendations of the Social and Economic Council of the Netherlands (SER), the Cabinet will create more room for experimentation within the framework of the Smart Regulation programme (*Ruimte in Regels*) in order to support circular initiatives in their development. It will do this both in a physical sense (e.g., in spatial planning or in testing facilities) and in the application of regulations (such as the Crisis and Recovery Act [*Crisis- en Herstelwet*]).

Inspectorates and local and regional governments need instruments to respond to circular initiatives that need room to experiment.

Producer responsibility

The current responsibility of producers is based on the EU Waste Framework Directive and currently applies to a limited number of product streams (cars, tyres, electronics, packaging and batteries). The Ministry of Infrastructure and the Environment has commissioned EY to conduct a study into the options for applying producer responsibility to new streams and the possibilities for strengthening the instrument itself. EY has named a number of product streams that are relevant for the Netherlands (such as mattresses, nappies/diapers, textiles and building materials). Also indicated is how producer responsibility can be boosted: with incentives for circular designs and the prevention of material use, high-quality reuse, and upcycling.[37]

Next year we will explore how we can expand the substantiation of the current producer responsibility. The Cabinet is considering agreements on the amount of reusable (recycled or biobased) materials. In addition, the Cabinet will foster a value chain approach to a number of priority streams, such as mattresses, nappies/diapers and textiles, aimed at developing sustainable business cases.

[37] http://www.ey.com/NL/nl/Services/Specialty-Services/Climate-Change-and-Sustainability-Services/EY-extended-producer-responsibility

An instrument that could be deployed to this end is the introduction of producer responsibility (e.g., requiring producers to take back discarded products).

Gearing standards to the circular economy

The setting of open standards can play a role in combination with certification and standardisation. In collaboration with the business community, the sectors, and NEN we are adapting the process in place for setting standards and issuing certificates. The process and the structures should be adapted in such a way as to enable innovative small and medium-sized businesses with their circular products and services to make better use of them. This will further implement the Dijkstra motion concerning the Dutch and European standards and the realisation of a circular economy.[38] The House of Representatives has already been informed about this.[39] The Netherlands is making a contribution to the efforts launched by the European Commission to establish European standards for a circular economy.

Promoting circular product design at the EU level and in transition agendas

In the European Council conclusions regarding the EU Action Plan for the circular economy, the European Commission is called on to tailor the Ecodesign Directive on products to the relevant criteria for the circular economy before 2020. This regulation pertains to aspects such as product lifespan, reuse, repairability, renovation, and recyclability. Along with other member states, the Netherlands will study how this European approach can be supported and accelerated. The Cabinet will monitor the established actions closely and will also conduct a study in collaboration with like-minded member states, with a view to supporting and accelerating the process. The Cabinet stresses the importance of tightening these regulations and intends to reinforce this by reaching agreements with producers under which new products contain recycled or biobased raw materials. Preferably, we will take steps to this effect within the framework of the transition agendas to be developed jointly. The Cabinet will not exclude the possibility, if it is necessary and effective, of making a certain percentage of recycled or biobased material in products mandatory if it is unsuccessful in achieving the goals at a sufficient pace in consultation with the value chain parties.

Conducive interpretation of rules to promote dynamism

Some of the barriers experienced can be solved by adapting European or national legislation. Other barriers are caused by differences in the interpretation of rules or by a lack of information. In the future, we want to adopt a more flexible approach to amendments of the National Waste Management Plan so that we can anticipate the changes required by the transition more quickly. The National Waste Management Plan sets out the current policy on waste.

Enforcement study

One primary role of the government is to protect public interests, e.g., in the areas of health, safety and the environment. In the transition to a circular economy, oversight and enforcement will change. This coincides with a shift in emphasis from origin (waste/no waste) to the characteristics of a raw material (market for secondary raw materials), as well as the more complex networks and cooperatives in the circular economy. This calls for a reconsideration of the knowledge, skill and capacity of the inspectorate. New detection technologies and methods (such as IT applications) might be necessary to be able to continue intervening quickly, effectively and selectively. Research will be conducted into the manner in which cost-efficient oversight and effective enforcement can continue to be guaranteed.

Enforcement dialogue

In the development of their innovation or investments for a new product or process, companies often have insufficient access to the implementers and inspectorate, even though they are important partners in the realisation of their business case. Room for innovation thus requires that enforcers are closely involved in the creation of legislation and regulations and that they listen to the needs of entrepreneurs. This fits in with the idea of the enforcement dialogue, a dialogue between policymakers, inspectorate and entrepreneurs, as was proposed by the Commission for Sustainability Issues and Biomass (*Commissie Duurzaamheids-vraagstukken en Biomassa*) in its advisory report on biomass in the circular economy.[40] An example of a platform with such a work method is the aforementioned Green Deal, the *North Sea Resources Roundabout*.

Use of Smart Regulation in priority sectors

Entrepreneurs often do not study the legal frameworks that pertain to their new product or innovation until fairly late in the game. This entails risks of delay and unnecessary tension with government policy. With regard to the five priority sectors and supply chains, the Cabinet intends to accelerate the transition by better anticipating the opportunities, barriers and risks for innovative entrepreneurs. For this reason, the Smart Regulation programme (*Ruimte in Regels*) will actively look for the

[38] Parliamentary documents II, 30 872, no. 154

[39] Parliamentary documents II, 30 872, no. 165

[40] Commission for Sustainability Issues and Biomass (*Commissie Duurzaamheidsvraagstukken en Biomassa*): Sustainable use and management of biomass streams. 2016

barriers to innovation that arise in these sectors during the transition. Studies will be conducted to this end and meetings will be set up with entrepreneurs and other government authorities.

4.2 Intelligent market incentives

Intelligent market incentives are meant to tackle imperfections in the market and to encourage the market to move in the direction of a circular economy through targeted price incentives and regulations. This intervention is intended to promote the demand for recyclates and biobased materials, to stimulate circular innovations and business models, and thus reinforce the national and international markets for these types of raw materials.

4.2.1 Barriers and opportunities

Social costs in the price

The benefits and costs for nature and the environment are not reflected or are insufficiently reflected in the price of a product. As a result, these aspects do not yet play a role in purchase or investment decisions. Assigning a value to these social effects promotes the creation of closed-loop circular business cases.

Promoting resource efficiency

There is a need for a market incentive that promotes resource efficiency, because resource efficiency pertains to both the sustainable and efficient use of raw materials and to the efficiency with which the raw materials are processed.

CO_2 market incentive in the chemical and plastics sectors

Producers of chemicals and plastics are pushing for the integration of renewable energy and climate policies, using a single parameter as the point of departure, namely CO_{2eq}. This is a calculation unit used to inter-compare how different greenhouse gases contribute to global warming. There is no market incentive for these sectors to use renewable raw materials, even though their use would contribute to replacing fossil carbon sources and reducing CO_2 emissions. This reduction does not play a role in the energy policy.

More conscious purchasing by the government

In government procurement procedures, the impact that purchases have on the use of raw materials is considered only to a limited degree. By setting requirements for government purchases that mandate the circularity of products and services, the government can encourage the market to use circular production methods and thus be a significant advocate for the circular economy.

4.2.2 Ongoing efforts

MIA and VAMIL tax schemes

Tax schemes such as MIA (*Milieu Investeringsaftrek* - Environmental Investment Rebate) and VAMIL (*Willekeurige Afschrijving Milieu-investeringen* - Arbitrary depreciation of environmental investments) give a significant boost to investments in environment-friendly operating assets. Both schemes pertain to sustainable investments that produce greater environmental benefit than is required by law. The MIA and VAMIL schemes are now already important instruments for realising the goals set out in the national visions on fuel, the circular economy, and sustainable agriculture. The annual revision of the Environmental List (*Milieulijst*) makes it possible to anticipate new sustainable technologies quickly. The Netherlands Enterprise Agency (RVO) is currently shedding light on how existing instruments such as MIA/VAMIL can be geared to circular innovations. It is also exploring the advisability of schemes aimed at the circular economy that promote the reuse of renewable and recyclable raw materials. Finally, greater attention is being given to communication about the available set of instruments in order to raise awareness of the schemes among the target group.

Further expansion of waste disposal tax

Starting from 1 April 2014, a waste disposal tax has been imposed on the disposal and incineration of waste. The reintroduction of the waste disposal charge has resulted in a manifest and immediate reduction in the volume of waste deposited. As of 1 January 2015, this tax was expanded to include waste that is incinerated.

4.2.3 Planned actions

Actions aimed at contributing to the climate policy

To further substantiate the focus on a single parameter, i.e., CO_{2eq}, in the circular economy policy, the following actions will be taken:

- Developing methodology for calculating CO_{2eq} reduction and its allocation in the biobased chemistry and biobased materials value chains to achieve CO_2 reduction after 2020;
- Study into fossil carbon pricing. Learning from existing experiences with CO_2 pricing;
- Commitment to accepting CO_{2eq} sequestration in existing and new forests (climate smart forestry) and products;
- Incorporating the contribution raw materials make to the prevention of CO_2 emissions.

The Cabinet will ascertain whether the Netherlands should expand the approach aimed at reducing CO_2 to include raw materials and the circular economy, among other areas, for the period after 2020.

The Cabinet will return to this at the start of 2017 in the House of Representatives.

Phasing out subsidies that are detrimental to the circular economy

At the national and European levels, the Cabinet will focus on phasing out (tax) market incentives that have a negative impact on the environment. A factor to be considered with respect to every subsidy that promotes the use of new products or the destruction of used products is whether the subsidy benefits the circular economy or not. If the subsidy does not promote the circular economy, alternatives should be sought that do have this effect.

European study into market incentives that promote a circular economy

The Netherlands is initiating a study with a European collaborative of interested member states to map out the possibilities and impossibilities of market incentives for the circular economy.

Encouraging circular and biobased products

The Cabinet will initiate a move to have product policy encourage circular and biobased products (at both the national and the European levels). Special attention will be given to the advantages of biobased and biodegradable applications in which substances return to nature due to wear or use (e.g. drilling fluids and lubricants).

The advisory report of the Social and Economic Council of the Netherlands (SER) and the European Council conclusions both indicate that there are possibilities to tailor the existing set of instruments of tax law, levies and subsidies to the transition to a circular economy.[41] The SER has also indicated that it wishes to play a role in this. The Cabinet is eagerly awaiting the SER's initiative on this point.

In the view of the Cabinet, various aspects should be considered in greening measures. For example, the measures should not lead to the loss of jobs across the border as, in the meantime, the global climate does not improve. Furthermore, the measures should be easy to implement for the Tax Administration. It should also always be considered whether other means, such as requirements and subsidies, would not be more effective or more cost-efficient than a tax measure.

Harmonisation of existing sustainability frameworks

It is advisable to harmonise existing sustainability frameworks for biomass and to develop a single framework for all raw materials, building on the existing sustainability frameworks for biomass. To this end, a study will be launched next spring that should give greater insight into how we can accomplish further harmonisation.

True pricing in the food value chain

The Cabinet is committed to greater transparency in the food value chain. In this context, it is studying the opportunities that *true pricing* offers, ascertaining the "real" costs of food, including any external effects that can later lead to costs elsewhere.

Socially Responsible Purchasing and innovation-oriented purchasing

Together with other government authorities and businesses, we will deepen and expand knowledge about circular procurement and the inclusion of total product life cycles and costs in tenders. At this moment, in the view of the Cabinet, the single or short-term price of a product is still too often the decisive factor for the selection of suppliers in government tendering and procurement procedures. The Cabinet aims to give more attention to integral life-cycle costs, environmental performance and the social costs during and after the life cycle of a product. It will boost these goals by purchasing more circular and biobased goods, thus creating or enlarging the market for sustainable and circular products and services. In the memorandum on Socially Responsible Purchasing[42], this is extensively discussed, as is the endeavour to raise the proportion of circular procurement to 10% by 2020. Moreover, in addition to the public sector, the private sector can also give a good example in this area.

Internationally, the Netherlands is seen as a leader in the area of circular or sustainable purchasing. Dutch experiences are published in both a European context and in the context of the UN.[43]

In addition to Socially Responsible Purchasing, innovation-oriented purchasing is also an important programme in the procurement domain. It encompasses tendering procedures and other processes that are necessary for the successful procurement of innovative products or services. From strategic policy up to and including the implementation and repeated purchase of innovations. The core of innovation-oriented purchasing is starting a dialogue with

[41] The Cabinet bases its choices regarding deployment of these "market incentives" on a number of criteria: effectiveness and cost-efficiency compared with alternative measures, the effects on employment, the feasibility and the solidity of the results. The testing framework for tax expenditures applies to the consideration of tax expenditures.

[42] Parliamentary Documents II, 30 196, no. 466

[43] For example, in the implementation of the European Council conclusions on the circular economy and in the UNEP "10-year Framework Programme on Sustainable Consumption and Production".

Truly believing in the circular economy

‘I would like to provide a bright future for my children, with lots of opportunities. This requires a future-proof world. This means that we will need to adapt the current economic system. Circular Economy is a way to achieve this goal, by creating cycles and optimising product lives. This will reduce leakage (waste) from our system.
I consider it important to view all this from an economic perspective (circular economy): it must be underpinned by a revenue model yielding both financial and societal returns.

Rabobank regards itself as one of the facilitators of the circular transition. As a bank, we are anxious to finance good circular business models. Good in this case means taking account of the triple bottom line: “people” (mankind & society), “planet” (the environment), but also a good revenue model (“profit”).

‘I would like to provide a bright future for my children ...’

The government can play a boosting role in this context and encourage circular initiatives. If the government were to express its firm belief in the circular economy, attaching concrete control measures to this end (in terms of taxation, subsidies, legislation, et cetera), this would accelerate the transition. Good initiatives have already been launched, for example, by CSR Netherlands, but more resources would be welcome.”

Jeroen van Muiswinkel
Sustainable Business Developer, Rabobank

the private sector long before the tendering process begins in order to encourage the business community to innovate and to be able to take their ideas into account in the actual purchase. This provides space for innovations in the area of renewable or biobased materials and other circular innovations. Use can also be made of the experiences gained during innovation-oriented purchasing and the channels in the purchasing domain in order to promote circularity.

National government gives a good example

The National Government itself wants to give a good example in the area of socially responsible and circular purchasing. Economic circularity in the operations of the National Government provides opportunities to profit from the economic perspective of a circular economy, to combat wastage of raw materials, to expand the scope for innovation, and create opportunities for new business models. The government is launching pilot projects involving circular and biobased operations in the categories of furniture, confidential paper, work wear, IT hardware, waste and raw materials, and catering.

In 2017, the government-wide implementation of the separation of office refuse will be completed. The goal is for the government to halve the volume of non-recyclable waste (comparable to household waste) by 2020, compared to the volume produced in 2012.

The national government has the ambition of setting up a first fully circular product category and to use lessons gained from it in order to set up five other circular categories starting in 2017.

In addition, the national government will also commit itself to more circular and biobased purchasing in the construction sector (see Chapter 5.4). The Central Government Real Estate Agency RVB and Rijkswaterstaat (the executive branch of the Ministry of Infrastructure and the Environment) have an important role to play in this as contractors.

4.3 Financing

Investments in circular products and services have a different risk profile, different depreciation periods, and a different cost-benefit balance from linear products. There is also still relatively little knowledge about circular business models. There is a demand for insight into a wider social cost-benefit balance and active support for circular business models.

4.3.1 Barriers and opportunities

Higher capital requirements

Circular innovations generally entail higher capital requirements. The return-on-investment times are sometimes longer, such as when businesses want to keep possession of their products and want to earn money through providing services.

Lack of knowledge and experience

There is a lack of specific knowledge and experience with the circular economy in the financial sector and among businesspeople. Private financers are also ignorant of circular innovations and therefore see investments in circular economy projects as high risk, partly due to their limited experience with circular revenue models.

4.3.2 Planned actions

Support private sector initiatives

The Cabinet intends to take decisions in the current cabinet term to further stimulate investments in the Netherlands.

With the Netherlands Investment Agency and the BNG Bank, the Ministry of Economic Affairs is also studying the feasibility of an Energy Transition Financing Facility. This facility is focused on boosting and realising economically and technologically sound projects that are difficult to finance at the moment. The projects should make a contribution to a sustainable generation of energy, energy savings, and the reduction of CO_2 emissions. They may also involve circular projects. Likely fields are, for example, sustainable energy (e.g. geothermal energy), the use of residual heat, sustainability in an urban environment (including social real estate, small and medium-sized businesses, and industry) and the circular economy. The pilot project is scheduled to commence before the end of this year.

The first commercial biobased factories have already been announced. To realise a sound investment for sugar processing, wood processing and pyrolysis, among others, the Ministry of Economic Affairs is looking into possibilities to support these companies.

Supporting entrepreneurs with developing revenue models

The transition to a circular economy is still in the early stages. The group of pioneering businesses is small but enthusiastic, and the group of companies lagging behind is large. In between them there is a growing group of businesses that see opportunities in the circular economy. Yet they have not yet cashed in on them and often also do not know how to do this. Encouraging circular entrepreneurship should be integrated into the current policy for encouraging sustainability in the business

community. The Cabinet also intends to support the group of "willing" companies more intensively in various ways.

- In recent years, experience has been gained with supporting these companies through the *Nederland Circulair!* programme. This assists companies in the areas of financing, value chain collaboration, start-ups, design, and business models. The plan is for this programme to continue;
- The Cabinet is exploring the possibilities for a low-threshold voucher scheme, providing entrepreneurs with knowledge and advice regarding the development of revenue models and the utilisation of financial instruments;
- In follow-up to the recommendation of the Social and Economic Council of the Netherlands (SER), the Cabinet will invite financial institutions and businesses to look into the possibilities of having new circular revenue models compete with linear revenue models.

Private funding

Private funding for circular developments clearly shows that there is support in society for the ambitions set forth by the government. The Cabinet is pleased that private financers, such as the three large banks (ABN-AMRO, Rabobank, and ING), have underlined the importance of circular entrepreneurship in a joint statement.[44] They will also investigate what else is necessary to increase the knowledge of financial products and risk management in light of the circular economy. The Cabinet will enter into a dialogue with private financers about what is necessary and how the national government can help to facilitate it.

In addition, through the *Funding of sustainable energy projects* Green Deal, a joint expertise centre of the government, major banks, and green banks is active.

European (co)financing

The European structural funds and the resources from the so-called *Juncker fund* (European Fund for Structural Investments, EFSI) also provide opportunities for Dutch businesses and governments to finance circular innovations and investments.

4.4 Knowledge and Innovation

The development of knowledge (education and research) and the dissemination and exchange of knowledge in networks are essential for the desired transition. This calls for a supporting infrastructure. The objective of the knowledge and innovation intervention is to provide those who play a central role in society with the information required to take decisions, and to tailor innovation more to the three strategic objectives of this programme.

In its recommendations, the Social and Economic Council of the Netherlands (SER) indicates that the transition to a circular economy introduces uncertainty about the structural changes in the labour market. New jobs can be created at all educational levels, yet at the same time attention should be given to the jobs that will possibly be lost.

4.4.1 Barriers and opportunities

Building up knowledge

The availability of knowledge that is important for the transition to a circular economy varies from one topic to the next. The development of information about material flows, natural capital, the biobased economy, and effect estimates regarding technology, the labour market, and quality labels is still in full swing. Yet much is already known about subjects such as assets, ownership ratios, prices, taxes, and subsidies.

Following the conclusions of the Social and Economic Council of the Netherlands (SER), the Cabinet has established that coherent and inter-connected regional policies regarding the creation of learning and experimental environments aimed at the circular economy are largely lacking.

The SER has also concluded that in the domain of the circular economy, especially, a tailored approach is required at job learning centres, and that the relevant regulations are too rigidly structured.

Labour market aspects

Following on from the SER recommendations, the Cabinet will conduct a study into the labour market aspects of the circular economy, the underlying mechanisms and the preconditions that must be met to contribute effectively to an acceleration of the circular economy.

Innovation policy

Entrepreneurs go through different stages in the development of their product or business model, from research to a fully mature product in a mature market. The government can implement policy to help a circular product or service move on to the next phase. Each phase calls for specific instruments.[45]

[44] MVO Nederland, Major banks support a circular economy in the Netherlands, 2016.

[45] *Massa is Kassa* [Mass is Cash], developed in the context of the SER Vision on Fuel.

To change the worn-out routines and structures of the linear economy, social innovation is just as important as technological and system innovations. Social change is necessary to give the new technology a place in society. In some respects, technology is even of secondary importance.

4.4.2 Ongoing efforts

Knowledge networks

The Netherlands has active knowledge networks operating in the domain of the circular economy at both the national and regional levels. A large number of institutions participate in these networks.[46] Other networks too, such as the Platform for Biodiversity, Ecosystems and the Economy[47], contribute to knowledge and practical experiences that support the transition to a circular economy. In addition, foreign knowledge institutes, such as the *Ellen MacArthur Foundation* (EMF), the *World Resources Institute* (WRI), the *Green Growth Knowledge Platform* (GGKP), the OECD, and the UNEP *International Resource Panel* (UNEP-IRP), also play an important role in the collaboration with Dutch knowledge institutes.

The Social and Economic Council of the Netherlands (SER) justifiably underlines the importance of strengthening the collaborative ties between governments, businesses and educational institutions at the regional level. In education, the circular economy is still a relatively new subject. Sustainability education already features many networks and curricula in which sustainability is embedded and supported by the inter-ministerial *Duurzaam Door* [Sustainably Forward] programme.

Knowledge agendas

A number of circular economy knowledge agendas have been drawn up, the *Groene Brein* (Green Brain) network has developed a knowledge map (www.hetgroenebrein.nl/kenniskaarten), and the Dutch National Research Agenda is giving attention to the circular economy (www.wetenschapsagenda.nl).

Rubber, plastics and metal

Within the "From Waste to Resources" (*VANG*) programme, networks have been set up for rubber, plastics, and metal to develop and transfer knowledge (www.circulairemetaalketen.nl). These networks, comprising representatives from the business community, research institutes, educational institutions, and the government, are being continued in 2017.

Biobased and circular economy

In recent years, networks and regional platforms have invested in the accumulation of knowledge regarding the biobased economy.[48] A network of scientists, businesses from different sectors, and NGOs is developing knowledge about the opportunities of biobased business cases, for example, in the *Biorenewables Business Platform* and the *Platform Agro-Papier-Chemie*. Furthermore, the development of the biobased economy is supported by cooperation with two educational centres for the biobased economy.

A good example of innovative education is a *Massive Open Online Course* on the circular economy (Circular economy: an introduction) with more than 1,700 participants from 49 countries (cf. www.biobasedacademy.nl). Delft University of Technology has organised a similar course on the circular economy that attracted more than 6,000 participants from 47 countries.

In Europe, the transition to a "Bio-Economy" is one of the social challenges in the European Innovation Policy (*Horizon 2020*). A key effort in this regard is the *Joint Undertaking Biobased Industries* (JU-BBI), an instrument with more than 3.7 billion euros in public and private contributions to build a bridge between research and the private sector. The goal is achieving a 20% market share for biobased chemicals and materials by 2020 and a market share of 30% by 2030.

Material Flows Monitor

In recent years, Statistics Netherlands (CBS) has compiled time series, via the national Material Flows Monitor (*Monitor Materiaalstromen*), of material use in the Netherlands linked to the Environmental Accounting, including water consumption, ownership ratios, and international value chains. Based on this work, the supply security risk for 64 metals and minerals for the Dutch economy could be brought to light. The circular potential of 1,100 abiotic product groups can now also be determined in terms of quantity. The monitor is being continued on the same basis, i.e., with the environmental accounting linked to the material flows monitor.[49]

[46] Such as CBS, TNO, PBL, Rli, NSOB, Delft University of Technology, Erasmus University, Leiden University with the Centre for Sustainability, Utrecht University with the USI, RIVM, CPB, WUR, Rathenau Institute, and Groene Brein.

[47] *Platform Biodiversiteit, Ecosystemen en Economie* is a collaboration between VNO-NCW and IUCN Nederland, supported by the Ministry of Economic Affairs. The Platform focuses on the development of business cases for handling natural capital in a sustainable manner.

[48] www.biobasedeconomy.nl/kennisnet

[49] Also based on the CBS report "Expanding the Material Flow Monitor, 2015", and actions set out in the Government-wide programme (linkage with planetary boundaries and SDGs, sustainability framework for all raw materials, regional tool, raw material scanner, biobased economy, resilience of value chains, et cetera).

Expanding the use of bioplastics

Tjerk de Ruiter, CEO of Corbion: ‘Polylactic acid (PLA) is a raw material that is used in, e.g., products for the medical industry and coffee capsules, plastic bags, (food) packaging, plates, and cutlery, but also in cars, textiles, and electronics. Corbion has already supplied the chemical building blocks for the production of polylactic acid. Now that we have built our own bioplastics plant, we can produce our own PLA, a biodegradable plastic made from biomass. As PLA is made from biomass, it is a renewable raw material and thus a fine example of a circular building block. It is compostable and can thus be used for consumables that are difficult to recover by recycling.’

That is another motive for Corbion. De Ruiter adds, ‘What is better than consumers directly contributing to the circular economy?’ He is proud of the fact that, for example, not only food packaging but also coffee capsules with coffee grounds and all can go into the organic waste bin.

‘PLA is a fine example of a circular building block.’

In addition to sugar, Corbion has also successfully used other types of biomass for their PLA production. As yet, this is a costly process, whose further development and upscaling requires more research. Corbion is setting up a consortium with private sector parties to enable its introduction and reduce the costs.

‘The use of bioplastics can be widely expanded. For example, by explaining to consumers that biodegradable plastics can be discarded in the organic waste bin. The government could be involved in raising public awareness concerning the advantages of degradable plastics.’

Tjerk de Ruiter
CEO Corbion

Investing in experiences with natural capital

In recent years, businesses, financial institutions and the national government have invested large sums in instruments and methods to make their dependence and impact on natural capital manageable. Thus, in the context of the Transparency of Natural and Social Capital Green Deal[50], more than 20 best practices have been collected, predominantly from businesses. Participating companies emphasise in the final report that better information on natural and social capital leads to better decisions and that there are now sufficient practical tools for businesses to work with. The financial sector has also explored promising approaches; for example, the Dutch Association of Investors for Sustainable Development (VBDO) has issued guidelines on natural capital for investors in sustainable development with the financial support of the Ministry of Economic Affairs.

Natural capital

In addition to promoting and facilitating the aforementioned activities, the government has also taken steps in the area of natural capital under its own responsibility. Information about natural capital and nature-based solutions is provided via the *Atlas Natuurlijk Kapitaal* (Natural Capital Atlas), via biomimicry in education (HAS University of Applied Sciences, Utrecht University) and the foundation *Biomimicry NL*. In addition, the Ministry of Economic Affairs and the Ministry of Infrastructure and the Environment have commissioned Statistics Netherlands (CBS) to explore the possibilities for setting up natural capital accounts in the Netherlands, which should give natural capital a place in the economic system. This exploration has led to the conclusion that the prospects are good. CBS is preparing subsequent steps, taking into account the Natural Capital Atlas.

Furthermore, a network has formed around sustainable area management called *Verified Conservation Areas* (VCA). This international VCA approach is used to enhance the transparency and accountability of sustainable area management in the Netherlands, with a view to providing new revenue models and attracting investors.

Dissemination of knowledge via raw materials knowledge plaza and regional tool

The raw materials knowledge plaza (*kennisplein grondstoffen*) and the associated tool that are currently being developed are intended to share all available information about the risks and opportunities involved in raw materials with entrepreneurs, (government) purchasers and policymakers in an interactive manner. Both will become available in 2016. The information available nationally will also be expanded and translated to the regional level via the development of a regional tool. The objective of this tool is to assist regional players in completing regional circular business cases. This tool will be actively offered to stakeholders at the regional level. For the five priorities in the national approach, the toolbox will be used to investigate where (on what scale level) possibilities exist for circular entrepreneurship.

Encouraging circular product design in the Netherlands

The Cabinet is convinced that increasing the life of products, making them repairable and using products more efficiently should be encouraged. To this end, the Cabinet will continue a programme aimed at fostering circular design and link it to the five priorities set out in this government-wide programme. Entrepreneurs and designers will be assisted, in interaction with scientists and students in workshops, with the development of new circular products, services, and business models.

www.circulairondernemen.nl and *Nederland Circulair!*

Since 2015, businesspeople have been informed about circular entrepreneurship via the platform www.circulairondernemen.nl. This platform will be continued in 2017 and the network function will be further extended.

The *Nederland Circulair!* programme, from which this platform and CIRCO have ensued, initiates different practical support programmes for companies and start-up enterprises that want to take the next step towards circular entrepreneurship. This programme will be continued in 2017.

KIEM-VANG programmes and Closed Loop Cycles

With respect to research and support, two programmes have been initiated that are specifically aimed at the circular economy. Firstly, the KIEM-VANG[51] scheme established by the Ministry of Infrastructure and the Environment and carried out by the National Coordinating Body for Practice-oriented Research (*Nationaal Regieorgaan Praktijkgericht Onderzoek*), which promotes research projects conducted by universities of applied sciences in cooperation with companies. These projects pertain to material flows: metal, plastics, rubber, biotic waste flows, nutrients, and building materials. This scheme will be continued in 2017. We are examining whether more of these networks can be set up; e.g., for the furniture and kitchen industry. Furthermore, in 2016 the NWO programme Closed Loop Cycles – Transition

[50] Ministry of Economic Affairs, IUCN Nederland, MVO Nederland, True Price, 2016, *Het loont om transparant te zijn. Geleerde lessen van de Green Deal Samenwerken aan Transparantie van Natuurlijk en Sociaal Kapitaal 2014-2016 [Being transparent pays. Lessons learnt from the Green Deal Collaborating on Transparency in Natural and Social Capital 2014-2016]*.

[51] Knowledge Innovation Mapping. http://www.regieorgaan-sia.nl/nieuws/pro-vang

to a circular economy (*Gesloten Kringlopen – Transitie naar een circulaire economie*) will be launched. This cross-sectoral programme (5 million euros) targets the Top Sectors of Agri and Food, Logistics, Horticulture & Cultivation Materials, and Water.

Top Sector policy, biobased economy programme, and circular economy

Apart from encouraging research and development investments via innovation subsidies (solving "market failures"), the current innovation policy is, to a significant degree, aimed at strengthening the collaboration between businesses, knowledge institutes, and governments (solving "system failures").

In the Top Sector policy, businesses, knowledge institutes, and governments work closely together on innovations to strengthen the competitive capacity of the Netherlands. The Top Consortium for Knowledge and Innovation (TKI) *Biobased Economy 2015-2027* is implementing four research lines focused on optimising the use of biomass for different objectives, such as for energy supply and chemicals. In addition, the consortium is working on relevant material and process innovations in the roadmaps of the Top Sector *High Tech Systems and Materials*.

Finally, initiatives in the area of the circular economy and *Biobased Economy* can make use of the government's existing financial tools.[52]

The Netherlands Enterprise Agency (RVO) will complete a study this autumn (2016) into the degree to which financial barriers, as presented in the literature on the subject, actually hamper circular and biobased initiatives, and how the national government can assist in reducing or removing such barriers.

4.4.3 Planned actions

Dynamic knowledge and innovation agenda

In collaboration with societal stakeholders, a government-wide knowledge and innovation agenda will be established in 2017, in keeping with the Cabinet's efforts to achieve a circular economy. This agenda will foster interconnectivity in the development of knowledge and build on the knowledge agendas already developed. Existing innovation lines, such as TKI *Biobased Economy 2015-2027*, and research programmes in the area of electric transport will be factored in. Furthermore, the knowledge and innovation agenda to be set up should provide room for the development of indicators for monitoring and quantifying the progress of the implementation of the circular economy and the programme (key performance indicators).

In its innovation policy, the Cabinet also aims to strengthen the collective attention given to the circular economy in the relevant routes of the Dutch National Research Agenda[53] and in the different Top Sectors.

Continued development of Natural Capital

In order to realise a circular economy that remains within the capacity of the earth to support it, the Natural Capital Atlas will continue to be developed, especially for local governments and businesses. This continued development will be aimed at identifying the potential of possible innovation, revenue models and business cases of natural circular solutions for businesses and local governments. In the meantime, a study will be conducted into how the Atlas can continue to exist after 2020.

The Dutch support for the VCA (Verified Conservation Areas) approach will also be continued in 2017 and the VCA network will be scaled up so that it can function as a label for natural circular solutions in area management.

Integrated knowledge bank

Statistics Netherlands (CBS) proposes supplementing the material flows monitor with other available information.[54] Examples include information on the degree of toxicity of materials and products, and how the Netherlands' use of raw materials relates to the planetary boundaries. The Cabinet will do this step by step, in order to produce a knowledge bank. All information from the knowledge bank will be disseminated via the raw materials tool for companies and the regional tool under development. In addition, it will investigate whether and, if so, what information about the effects on biodiversity can be linked to the raw materials databank in order to be able to take better account of the risks and dependencies of natural capital.

The knowledge bank (with information and access tools) can lead to an infrastructure in which, for instance, strategic agenda setting for European research and investment funds is commonplace.

[52] For example, Innovation Credit (*Innovatiekrediet*), Agricultural Guarantees (*Garantstelling Landbouw*), Business Financing Guarantees (*Garantie Ondernemingsfinanciering*), the Green Projects Scheme (*Regeling Groenprojecten*), Early Phase Financing (*Vroege fase financiering*), the Growth Facility (*Groeifaciliteit*) or SEED Capital.

[53] Under the National Research Agenda (Nationale Wetenschapsagenda), the Smart Industry, Circular Economy, and raw materials routes are being developed: sustainable circular impact, and Materials Made in Holland (www.wetenschapsagenda.nl).

[54] CBS, Expanding the Material Flow Monitor, 2015.

Tenders and competitions

The Cabinet intends to challenge parties through, for example, tenders and competitions to invest in value chain cooperation and in the joint tackling of a social challenge. This approach is not yet commonplace, yet it does fit in well with the socially responsible purchasing policy under which government contracts are awarded on the basis of desired performance or social values.

Communities of practice

For the five priorities from the Government-wide programme (see Chapter Five), the national government will set up a number of *communities of practice*. This also ties in with the recommendations of the Social and Economic Council of the Netherlands (SER). Communities of practice are a valuable instrument for businesses to gain new knowledge in the area of the circular economy, primarily when giving practical substance to the business operations. The experience gained in this way is very significant for other companies.

Cross-sectoral approach

The circular economy is a theme that often affects several (Top) sectors. In the policy on Top Sectors and industry, the circular economy is taken up as a cross-sectoral theme. Together with the business community, knowledge institutes, and the government, the desirability and feasibility of a number of roadmaps for the priorities will be explored.

Circular Challenge Project

The Cabinet will challenge the initiators of the *Circular Challenge* project to develop a business case based on innovation and investments that can offer a sustainable solution for the social issues of our time. The feasibility of such a business case often depends on the question of whether governments – central, regional and local – have adopted an integral policy approach (e.g. in the areas of raw materials, energy, and the environment) with appropriate regulations. By involving and gathering the expertise of the government early on, a collaboration is created to foster innovation within a financially profitably business case with a view to legal authorisation. This immediately provides opportunities for the European internal market and, where possible, the government as a "launching customer". Ties can also be sought with existing initiatives such as *NL Innovative Topland* of the Confederation of Netherlands Industry and Employers (VNO-NCW).

Vocational education

The Cabinet aims to embed the circular economy firmly in education. For the higher education sector, a *Circular Economy Platform* will be set up for lecturers at Universities of Applied Sciences with the objective of developing and coordinating research programmes, and exchanging knowledge.

For secondary schools, the Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs have set up the *Duurzaam Door* programme (Sustainably Forward). The substantiation of this programme is currently being studied, as are ways to flesh out the directive role.

Channel existing EU resources to the circular economy

The EU is an important source of funding for research and innovation for the circular economy (Horizon2020 and LIFE). For the budget years 2016 and 2017, Horizon2020 has allocated approximately 650 million euros to circular economy projects, including funds for large demonstration projects aimed at closing the loop in the raw materials and water cycles, funds for regional development projects, and funds for the development of new business models. The Netherlands is already making good use of these resources. Small and medium-sized businesses are playing an important role in this and should be able to benefit from the available resources as well. The Cabinet is committed to ensure that Dutch businesses enjoy maximum profit from these resources. It also aims to embed the circular economy securely in the *Horizon2020 work programme 2018-2020* and to channel the financial resources of the European Investment Bank (EIB), the European Fund for Strategic Investments (EFSI), and the global funds of the World Bank and International Finance Corporation (IFC) to the circular economy.

4.5 International Cooperation

The circular economy is an international challenge. Various global developments require a radical change in global production and consumption patterns:

- the rapid development of countries;
- the growing world population;
- the effects of climate change;
- the growing scarcity of natural capital and raw materials;
- the rising demand for products and food.

In other words: the absolute decoupling of our raw materials consumption from economic growth presents us with a collective challenge. The transition to a circular economy makes a significant contribution to resolving this issue.

In order to realise a circular economy in the Netherlands, it is essential that this transition also takes place at the European and global levels. Value chains and waste flows are international and, although use or consumption takes place in the Netherlands or the EU, the discarded products or materials do not by definition end up in the Netherlands. Legal and economic preconditions are to a large degree established on European level and Dutch businesses

Launching successful initiatives across the globe

After I had started and built up companies in the United States, I returned to the Netherlands, where I intended to set up a business that would make a positive contribution to the world. So I thought to myself: what would really contribute to resolving the climate issue on a global scale?

‘I intend to set up a business that would make a positive contribution to the world.’

I decided to join forces with Black Bear, a company that recycles carbon black from car tyres. This resolves two issues. First of all, we reduce the pile of discarded car tyres: some 2 billion a year. In many cases, these are burnt, emitting high levels of CO_2, or they end up on a landfill. In Africa, they are a source of malaria problems, because mosquitos thrive in the water that collects in the tyres.

The carbon black we retrieve from old tyres can be re-used for the production of new tyres or, for example, paint or ink. The quality of the carbon black we retrieve is similar to that of the carbon black commonly extracted from petroleum oil. But our new production process emits far less CO_2, and it yields valuable oil and gas as by-products.

Our initiative is capital-intensive and we needed financial support long before we could produce something concrete. Fortunately, we received subsidy from the government – without which we couldn’t have made it – but that required us to keep extensive records: retaining receipts, clocking hours. This is quite a burden. Really putting the circular economy on the map requires a few worldwide successful initiatives. This is what the government should focus on.

Martijn Lopes Cardozo
Black Bear

increasingly operate internationally.

A successful Dutch policy for the circular economy will therefore require operating on several levels. At the EU level, we are working on the right legal and economic preconditions and incentives so that we can then implement them as effectively as possible at the national level. At the same time, we are committed to better understand the impact that a circular economy in the Netherlands and the EU may have on other countries, especially low-income countries. In a UN context and in international public-private partnerships, we are committed to an ambitious agenda for an international circular economy without any negative impact on low-income countries. In this respect, we will capitalise on the strengths of the Dutch economy and turn our national knowledge and expertise into a product to be exported to other countries.

Three objectives
Three objectives are key to international cooperation in the area of the circular economy:

Creating international conditions for a circular economy
The Cabinet is committed to creating an enabling environment for the transition to a circular economy: both legal preconditions (legislation and regulations) and economic preconditions (a well-functioning market for secondary raw materials). This is particularly relevant for European cooperation with regards to EU legislation and the common market.

International market for Dutch leaders
The circular economy provides international opportunities for the Dutch business community. By operating strategically at the international level, our innovations can be capitalized abroad. The export of Dutch knowledge and expertise abroad can strengthen our frontrunners position internationally and create economic benefits.

Contributing to an international circular economy without negative impact
In order to build an international circular economy and contribute to realizing the SDG's, the Cabinet intends to make Dutch knowledge and experience available beyond our national borders, working together with our companies and other partners. These efforts will be focused on those countries and local communities that have difficulty coping with the social and environmental impact of the current linear economic system, and where a circular economy could contribute to a local sustainable economy and the security of supply of critical materials.

A study conducted by the Centre of Expertise on Resources[55] shows that the negative effects of a circular economy in Europe will be limited for most developing countries that export raw materials. The EU-bound share of the export is often relatively small and accounts for less than 5% in the GNP of these countries. This would change if other countries that import raw materials also make a transition to a circular economy. Particularly in countries where a lack of good management and large demographic pressures may increase their economic vulnerability. To avoid overall negative effects, special attention should be given to countries that export raw materials that are also dependent to a large degree on the extraction and export of primary raw materials.

4.5.1 Barriers and opportunities

The perspective of a circular economy offering solutions for global issues concerning raw materials has not yet taken root everywhere. Some countries that export raw materials are, for instance, concerned that the circular economy in Europe could lead to a decreased demand for raw materials and thus jeopardise their economic development. At the EU level, although there is broad support for the circular economy, opinions may differ with respect to the right pace and the level of ambition. Some eastern member states express concern about the feasibility of ambitions and are asking for support in making the transition. In order to build EU-wide and global support for ambitious measures, it is therefore important that everyone is able to profit from the economic, social and environmental benefits of the circular economy.

The circular economy calls for a new, facilitating role for the government and for new ways of cooperation between governments and the business community, between sectors and supply chains. The Netherlands has experience with this: the "polder model" is in our genes. But on the international playing field, this is still a relatively new approach that cannot be applied one to one in every context.

These barriers can be partially removed simply by showing that it works. In recent years, the Netherlands has established an international reputation as a frontrunner in the circular economy, with knowledge and experience in the areas of waste and nutrient management, technological and social innovation, an integrated approach and cross-sectoral cooperation with companies, knowledge institutes, and governments. Dutch companies are international leaders in the fields of water, agriculture, maritime activities, logistics, and governance, and presenting integral solutions. These are the "unique selling points" with which Dutch

[55] Centre of Expertise on Resources: The Circular Economy and Developing Countries, COE-Resources Issue Brief 3, 2016

partners can capitalize their knowledge and experience internationally.

4.5.2 Ongoing efforts

International conditions

During the Dutch EU presidency in the first half of 2016, the Netherlands actively brought forwards the Commission proposals on a circular economyon the agenda and organised various meetings to collect input from European stakeholders.[56] As a result, in the Environment Council on June 20th 2016, the member states unanimously declared their support for a European transition to a circular economy. They called on the European Commission and on each other to remove barriers in regulations, to create circular incentives within current policies, to deploy market-based instruments instruments, to take an integrated approach, and to create room for circular initiatives, e.g., via Innovation Deals. In addition, they are calling on the European Commission to take concrete measures for the sustainable sourcing of raw materials, promote a longer lifespan of products (e.g., via the Ecodesign Directive), to reduce plastic waste, to tackle food wasta, and to establish a platform for cooperation to support swift implementation of the Action Plan.[57]

On March 3rd 2016 the *North Sea Resources Roundabout was concluded*: the first international Green Deal, initiated by The Netherlands.[58] This illustrates a new way of cooperation in an EU context, based on voluntary cooperation between governments and companies that are leading the way in the transition in an area in which an EU-wide approach has not yet been established.

In a manifesto under the Dutch presidency during "*Bio Economy Utrecht 2016*", the European bio economy stakeholders called on the bio economy strategy from 2012 to be revised. The Netherlands strongly supports a firm bio economy strategy from the European Commission.

International market for Dutch leaders

The government helps create international business opportunities for the private sector via, for example, the Top Sector policy and by organising trade missions. Economic diplomacy has been mostly aimed at the waste and recycling sector, yet it also concerns the (re)use of raw materials, circular design and production, social innovation, and the creation of added value via integral supply chain cooperation.

The Dutch business community is also active in this respect. The "*Netherlands Circular Hotspot*" campaign of last year, for instance, resulted in the opening of the Circular Economy Expo in Hoofddorp and a successful incoming trade mission in April 2016.

Towards an international circular economy without passing on negative impacts

The Netherlands operates in global bodies such as the UN and the OECD in order to realize the potential of the circular economy to reduce pressure on the environment, to assure supply security of resources and to promote geopolitical stability.[59] In focused partnerships, the Netherlands works with public and private stakeholders on specific supply chains and sectors, such as the UNEP Global Partnerships on Nutrient Management and Marine Litter. In addition, it is working on International Corporate Social Responsibility (IMVO) covenants that are concluded in multi-stakeholder contexts (between the private sector, NGOs, trade unions, and the government) in which the circular economy can play a part in removing the social and environmental impacts of our linear economic system and converting them into opportunities for sustainable economic growth. New IMVO covenants, such as the one for clothing and textiles, as well as the covenants under preparation for electronics and metals, offer the possibility of including *roadmaps* for the circular economy. Further more the possibilities for a more circular economy in urban deltas will be explored, with the aim of strengthening local economic development.

Internationally, through the World Bank/International Finance Corporation (IFC) for example, the Netherlands supports the application of the Natural Capital Protocol by companies and the use of natural capital accounts by governments.[60]

With regard to the SDG's, the Cabinet intends to give an assessment by autumn of how the Netherlands can fulfil its responsibility, in concrete terms.

At the same time, impact assessments will be conducted at an early stage to map out the effects that policy options for a circular economy will have on global sustainable developments and low-income countries. This will strengthen

[56] This is implementing the motion of Dijkstra (Parliamentary documents II, 21 501-08, no. 557) that calls on the government to work intensively in new proposals for the promotion of investments and the removal of barriers.

[57] Council of the European Union, Council conclusions on the EU action plan for the circular economy, 20 June 2016 and Council conclusions on Food losses and food waste, 28 June 2016.

[58] See paragraph 4.1.2

[59] such as UNEP (incl. via 10YFP), OECD, World Bank, UNECE, WRI and IRP

[60] www.naturalcapitalcoalition.org/protocol

INTERVIEW

Discarded fishing nets given a new life as carpets

‘We came up with the idea during a brainstorming session. At that time, we did not just procure yarn, we also provided our suppliers with recycled yarn. A successful example of a circular value chain. Eventually, market demand for recycled yarn exceeded our supply. This made us wonder whether fishing nets, made from high-grade nylon, could be used as an alternative source for the yarn in our carpet tiles.’

‘In the coastal areas of development countries, large sections of the population fish for their living. Discarded fishing nets seriously affect the eco systems of these areas. Through the Net-Works project, set up in collaboration with the Zoological Society of London (ZSL) and yarn manufacturer Aquafil, local fishermen are trained to select and clean discarded nets. The coast and the ocean are cleaned, thereby restoring biodiversity. The local population makes some money and Interface re-uses valuable resources for the production of carpet tiles.’

‘Increasing the appeal of using end-of-life products as an alternative source of scarce and expensive resources requires a new balance in the tax system. Under the current system, labour is heavily taxed, whereas hardly any tax is paid on energy and resources. The current system thus encourages exactly the opposite of what a circular economy aims to achieve, viz., more work, a reduction in energy consumption, and a more efficient use of existing and old materials.’

‘... hardly any tax is paid on energy and resources.’

‘With Mission Zero, Interface aims to eliminate any negative impact on the environment by 2020. In addition, with our new Climate Take Back mission we aim to make a restorative contribution to the environment and combat climate change.’

Ton van Keken

Vice President of Operations, Interface

policy coherence and synergy. In addition, any future passing-on effects can thus be prevented or mitigated as much as possible.

In an international context, attention will be given to the export of recyclable waste and the risk of passing the issue on to low-income countries.

4.5.3 Planned actions

International conditions

At the European level, the Cabinet has the ambition of implementing the circular economy package of the European Commission and the relevant Council conclusions in the very near future. This calls for creating the right conditions for the circular design of products and services, for longer product lives, and for uniform product and waste regulations that are conducive to a circular economy. This will give secondary raw materials access to the European market, enabling the sustainable sourcing and use of raw materials, and the targeting of public and private financing sources to circular innovations.

Strategic coalitions

To guarantee sufficient support for these Dutch ambitions, it is essential that efforts are not solely directed towards the European Commission. Also in light of the current dynamics within the EU, it is important that efforts are also focused on strategic coalitions with frontrunning public and private stakeholders , as well as on sharing knowledge and experience with other parties.

The activities that the Cabinet has in mind are:

- Establishing and actively participating in a *European platform for the Circular Economy*[61];
- Coordinating and steering the implementation of the European *Action Plan for a Circular Economy*, e.g., via an policy network of directors/directors-general;
- Supporting the transition in eastern and southern member states in cooperation with other leading European countries;
- Initiating and contributing to European and regional conferences, such as the European Conference on Plastics (December 2016);
- Concluding international Green Deals in follow-up to the *Green Deal North Sea Resources Roundabout* (NSRR), e.g., in European river basins and in areas with market potential for recycled nutrients from animal manure and other organic residual waste flows.

International market for Dutch leaders

The development of business cases, the organisation of trade missions, and government-to-government (G2G) support can be mutually supporting. This can result in ambitious public-private collaboration that focuses on specific opportunities and dilemmas in rapidly growing cities in emerging markets and developing countries. The best practices of the Dutch circular economy are used to position the Netherlands as a *Sustainable Urban Delta*, building on experiences with the *Clean Urban Delta Initiative* in Rio de Janeiro.[62] A smart connection of the supply and demand for knowledge and expertise in the world's urban deltas can boost local economic development and activity.

Efforts expended by embassies

During the EU presidency, Dutch knowledge and experience regarding the circular economy attracted considerable international interest. Various embassies, for example in Denmark, have since organised seminars/events with the local business community to support the circular economy. Substantive support for the embassies will be structured, thus enabling them to properly propagate the Netherlands' leading position in this area.

Holland Circular Hotspot Platform

The Ministry of Infrastructure and the Environment, together with the trade association Envaqua for water and environmental technology, will soon launch the platform *Holland Circular Hotspot*. This platform focuses on companies and knowledge institutes in the waste and recycling sectors that (want to) operate internationally, and on companies and knowledge institutes that focus on the transition to a circular economy and that (want to) share their knowledge and expertise internationally. Attention is also given to the domestic market, which enables us to present iconic projects abroad. The platform *Holland Circular Hotspot* can lend support for a firm international positioning of the Dutch private sector in the area of a circular economy, building on successful initiatives like the one launched by *Netherlands Circular Hotspot* (NLCH).

Trade missions

Incoming and outgoing economic missions have provided a spotlight for circular innovations in the Dutch private sector. Two missions to Eastern European countries and a climate adaptation mission to Indonesia are scheduled for the autumn of 2016; the Netherlands will also participate in the first Chinese circular economy trade fair to be held this autumn.

[61] See footnote 10.

[62] Clean Urban Delta Initiative Rio de Janeiro, see http://goo.gl/PsqQPb.

Research

To shed light on the impact of the circular economy on global sustainable development and to strengthen policy coherence and synergy, the Cabinet is studying potential barriers and undesirable effects of existing measures with regard to waste processing (e.g. waste from electronics, textiles, metal, and paper) to serve as a basis for the development of a circular economy in developing countries. Impact reports, drawn up with the support of the Netherlands Commission for Environmental Assessment (MER), will enable the identification of potential unforeseen effects at an early stage of policy development, and mitigation of any future passing-on effects.[63]

Cooperation with the Caribbean region

An initiative has been launched with the United Nations Environment Programme (UNEP) based on barriers perceived in our constituent parts of the kingdom and municipalities in the Caribbean region, in order to develop a good approach to waste management and the circular economy. The initiative will consider how, through innovation and partnerships between the islands and between private and public parties, the circular economy can be developed in these areas. This initiative, which can already count on the broad support and enthusiasm of the island residents, can possibly lead to an international Green Deal between the *Small Island Developing States* (SIDS) in the Caribbean region, UNEP, the Dutch Government, and private companies in, for instance, the tourism sector.

Cooperation with countries exporting raw materials

The Cabinet is committed to cooperating with countries that export raw materials and with countries that have large waste flows around rapidly developing cities on the basis of the so-called "*mutual gains approach*", which aims to remove the negative social and environmental impact of our linear economic system and to convert it into opportunities for sustainable economic growth. An example of such an approach is the relationship that the Netherlands has entered into with Morocco. This relationship was established in light of Morocco's strong position as an exporter of phosphate and its vulnerability with respect to water management (a scarcity of water) due to climate change. Similar opportunities also present themselves in international material value chains of, among other materials, tin, gold, lithium, textiles, nutrients, and plastics or in sectors such as the metal sector and the maritime sector.

[63] Quick scan Circular economy: effects on developing countries, PBL, 2016.

5 Priorities

5.1 Biomass and food

5.1.1 Why this priority?

Biomass is an indispensable raw material in the circular economy. This is the case for both produced biomass and biomass from residues. By its nature, biomass is a circular raw material, which distinguishes it from other raw materials. Biomass is used for food and feed; it is a base material for, inter alia, textile, paper & carton, building materials, chemicals, plastics, transport fuels, and energy.

Biomass is thus of essential importance for reducing our CO_2 emissions and our dependence on fossil resources. Furthermore, its use contributes to the greening of several major economic sectors with considerable large exports (biobased economy).

5.1.2 Vision for 2050

In a circular economy the closure of loops is central. Biomass and biotic residues can eventually be incorporated into natural cycles (biosphere), provided they do not carry any risks for public health and the environment. Because of the growing world population more biomass needs to be produced for food, feed, energy, materials, and other applications. In order to reduce pressure on natural capital and to make more biomass flows possible, it is important that biomass is retained in cycles for as long as possible. The closed loops principle is not new to the agro sector; this sector traditionally revolves around natural cycles. However, as a result of industrialisation and internationalisation in the past century, this sector has also evolved into a largely linear system focused on efficiency.

In a response to the WRR [Dutch Scientific Council for Government Policy] report *Towards a food policy*[64], the Cabinet presented its views on food policy to the House of Representatives on October 30th, 2015.[65] In its response, the Cabinet indicates to pursue an ecologically sustainable food system in which raw materials, energy, water, and nutrients are utilised economically and efficiently, the preservation of natural capital is taken into account, and natural capital is used in a sustainable manner. This means that the quality of soil, water and air is protected, and biodiversity is maintained, while at the same time reducing greenhouse gas emissions.

Furthermore, on 27 January 2016, the Cabinet presented the *Strategische Visie voor de inzet van Biomassa op weg naar 2030* [Strategic Vision for the use of Biomass on the road to 2030] to the House of Representatives.[66] This indicates that sufficient sustainable biomass could potentially become available to meet the Dutch demand for biomass for food, feed, energy, transport, chemicals and materials. Provided that the efforts bear fruit, the focus will be on expanding the supply of biomass and the optimum use of biomass. For reasons of cost effectiveness and the relatively limited availability of other options, bio-energy will continue to be stimulated under climate adaptation and renewable energy policy. In addition to food and feed, biomass is increasingly used in sectors featuring few other renewable alternatives: chemicals & materials, aviation & shipping, long distance heavy road transport, and high temperature industrial heat. This government-wide programme constitutes a next step and contributes to the realisation of the two visions outlined above.

5.1.3 Strategic goals

The three strategic goals of the programme will translated to the biomass & food priority in the following manner:

1. Optimising the use of biomass and food by closing loops. All raw materials, semi-manufactures, and products must remain in cycles as long and at as high a grade as possible, by utilising raw materials to the largest extend possible, making high-quality use of biomass, and recycling residues. This also calls for optimising efficiency in the use of biomass (cascading and multiple valorisation), amongst other ways by combating (food) wastage, preventing waste, the well-balanced application of fertilisers, and efficient incineration;

[64] Parliamentary Documents II, 34 395/22 112, nr. 2 en nr. 3.

[65] Parliamentary Documents II, 31 532, nr. 156.

[66] Parliamentary Documents II, 33 043, nr. 63.

2. Reducing the use of and replacing fossil resources by sustainably produced biomass;
3. Developing and implementing new production and consumption methods that lead to improvements and deviations from the trend in the use of biomass and food. An example is the transition towards the use of alternative proteins.

5.1.4 Ongoing efforts

Sustainable biomass and food production

Promoting sustainable trade value chains

The agro & food and biomass sectors operate at an international scale and depend on import for many of their raw materials. Their international nature is a factor complicating the closure of loops and the sustainable management of natural resources. The Sustainable Trade Initiative (*Initiatief Duurzame Handel, IDH*) and Solidaridad are key partners in promoting the sustainability of trade value chains. As indicated in Paragraph 4.5, the Cabinet fosters sustainability initiatives launched by the sectors, public-private collaborations, (international) Green Deals, and the conclusion of ICSR covenants (ICSR = International Corporate Social Responsibility). In addition, the government supports initiatives such as the *Alliance for Climate Smart Agriculture* and the *Round Tables for Responsible Soy and Palm Oil*.

Animal proteins

The Letter to Parliament about the *Insects for feed, food and pharma* Green Deal[67] outlines the Dutch government's commitment to improve the potential uses for insects. These efforts have brought the use of insect protein in feed a step closer. Furthermore, the Netherlands is making the case in the EU for to allow the use of animal protein derived from offal and approved pigs and poultry in pig and poultry feed. A careful approach is preconditional in this respect, in order to prevent another BSE outbreak and violation of the anti-cannibalism principle. The use of such animal proteins is currently already allowed for pisciculture feed.

Regional cultivation

Dutch policy is also aimed at reducing the import dependency for raw materials. The Cabinet champions sustainable regional cultivation and the development of alternative sources of protein. Within the Agri & Food Top Sector, specific room has been created for relevant research proposals. Ongoing studies currently explore how Dutch soy cultivation can be fostered, for example, through research into strain and culture improvement. A promising alternative source of protein is sea cultivation of algae and seaweed; this may contribute to expanding biomass production on a regional scale. The first "sea farms" have now been set up.

Optimum utilisation of biomass and food

Sustainable consumption

As indicated in the Food memorandum, the Cabinet is committed to sustainable consumption. The manner in which consumers deal with their food, in terms of both purchase and use, impacts the use of farmland and resources. For this reason, consumer behaviour plays a key role in the pursuit of sustainable food production. Dietary adjustments, for example, the use of alternative proteins, can yield benefits for both the environment and public health. Knowledge of (consumer) behaviour, education, and culture are equally important as, if not more important than, technological innovation in this respect.

Food wastage

The Cabinet is committed to minimise food wastage. In its response to the initiative note *Aanpak voedselverspilling* [Tackling food wastage] submitted by MP Dik-Faber, in its response to the aforementioned WRR report, and with the Letter to Parliament "*Rapporten voedselverspilling*" [Reports on food wastage][68], the Cabinet has outlined its policy to combat food wastage. The focus is on monitoring, consumer information, revision of best-before dates, food banks, innovation through the Agri & Food and Horticulture & Cultivation Materials Top Sectors, the removal of statutory obstacles, and positioning this topic on the European and global agendas.

Residues

In the context of a circular economy, it is important that offshoots and residues are regarded as base materials rather than waste. Various residues from the food industry, such as beetroot pulp and brewery dregs, are already processed within the feed value chain. Under certain conditions, foodstuffs that are no longer fit for human consumption will be converted to feed. Base materials are thus preserved within the food value chain. In this context, the Netherlands has successfully advocated that vegetable residues suitable for processing into feed are no longer regarded as waste. The Circular Economy Action Plan of the European Commission comprises a proposal for amendment of the waste regulations. This amendment harmonises the use of such residues for feed.

Loop closure

From Waste to Resources

The Cabinet endeavours to support initiatives aimed at closing biomass loops, producing recycled raw materials, and the maximum and multiple valorisation of biomass.

[67] Parliamentary Documents II, 33 043, nr. 64.

[68] Presentation of reports on food wastage, 18 August 2016

Saving kilos of food

'At the Albert Heijn supermarket chain, I started as a trainee in the department responsible for sustainability. Of course, as a child I learned to finish my plate, not throw away food. Only during my traineeship I saw with my own eyes how much foodstuffs we throw out. I just had to do something about that.

'... as a child I learned to finish my plate ... '

Together with three other trainees I submitted a proposal to the Jong Ahold ideas contest to start a pop-up-restaurant using the left-overs of the AH supermarkets. And we managed to set up such a restaurant: in the Westergasfabriek in Amsterdam. Instock, as we called the Foundation that ensued from the contest, now has two branches: one in Amsterdam and we recently opened another one in The Hague.'

'The restaurants are where everything comes together. But we also want to encourage people to prevent wastage. Our next step is the upcycling of product development. For example, with our spud beer: rather than malt, we use potatoes that would otherwise have been thrown out. We have also developed a cookery book focused on the preservation of food.'

'The next step is to replace our van that we use to collect products from Albert Heijn supermarkets, with a slightly bigger electric van. This will allow us to make runs every other day, rather than every day. Unfortunately, nowadays you need a HVG licence to drive such vehicles. The government could do something about that, in addition of course to raising public awareness regarding food wastage.'

Selma Seddik

Co-founder of Instock

Examples include the "Grondstoffenfabriek" [Raw materials plant] Green Deal initiated by the water authorities to extract valuable raw materials from waste water, and the "Business with biomass and biobased gas" Green Deal.

Soil quality

The preservation of a fertile and healthy soil is vitally important to be able to produce biomass for food and other purposes. Soil quality is pressured by the intensive agriculture of the Netherlands. To maintain the long-term health and productivity of the soil, it is important that the soil contains sufficient stable organic matter and optimum volumes of nutrients. Expanding stable organic matter in the soil increases ecosystem services by expanding the water storage capacity, increasing resistance to diseases and infestations, and retaining carbon in the soil in order to combat climate change.

Nutrient cycle

In addition to good soil management, we need to pursue closure of the nutrient cycles. This involves essential nutrients such as phosphate, nitrogen, and micro nutrients some of which are potentially scarce (phosphate) and whose extraction, production, and use may also cause environmental problems (eutrophication, greenhouse gas emissions, and pollution)[69]. Efforts are made to optimise the recovery of nutrients from residues in order for them to be reused. However, large sections of the Netherlands fail to achieve the target values set for ground and surface water quality. The Dutch manure policy encourages farmers to minimise the input of nitrogen and phosphate in the cultivation of their crops. This promotes the efficient use of nutrients in agriculture.

Precision farming

A next step in closing the nutrient cycles is the development of precision farming, in which nutrients are used in the right place, in the right quantities, and at the right time, thus ensuring that fewer nutrients are wasted. This also prevents nutrient leakage into the environment, which could cause eutrophication issues. This is encouraged by an extensive innovation programme rolled out within the Agri & Food Top Sector. One of the challenges is the reuse of recycled nutrients, by the application of technologies such as precision farming.

Replacing fossil resources by biomass: biobased economy

The Biomass Vision for 2030 sets out the target of reducing the share of fossil resources in the Dutch economy to 70% by 2030. Under the SER [Social and Economic Council of the Netherlands] Energy Agreement, the SER Fuel Vision, and the Biomass Vision for 2030, the Cabinet and various NGOs are expending substantial efforts in the fields of bio-energy, biofuels and sustainability criteria. Biomass is indispensable for replacing fossil resources in the chemical industry and in plastics. The biobased economy is already growing steadily.[70]

Chemical production in the Netherlands based on biomass: "green chemistry"

In addition to climate benefits, green chemistry offers opportunities for new investments and employment, for example, biochemical plants for bio refinery and the production of advanced biofuels, biobased chemicals and materials. The Top Sectors have launched an extensive innovation programme to foster this development.[71] This should make it possible to unravel biomass into various high-grade components for different applications.

5.1.5 Planned actions

Sustainable biomass and food production

Food

The Ministry of Economic Affairs recently commissioned the Netherlands Environmental Assessment Agency (PBL) to explore what is required to make the food value chain more circular.[72] PBL has indicated that interconnectivity between policy areas must be improved. In addition, PBL has identified preconditions for a circular food system: sustainable use of resources (soil, water, minerals) in the Netherlands and beyond, and optimum use of food and residues. In the progress memorandum regarding the Food Agenda, to be published this autumn, this PBL policy memorandum will be taken into consideration.

Sustainability frameworks and criteria

A host of systems are available to safeguard the sustainable production of biomass using ecological and social sustainability criteria. With respect to the origin of biomass, for example, it is important to avoid any evasion of ecological or social responsibilities at the international level. However, these sustainability criteria differ from one type of biomass, region, or application to the next. This differentiation has produced a wide range of certification schemes, resulting in high cost and lack of clarity for both

[69] Advisory report by the Soil Protection Technical Committee (TCB), *Toestand en dynamiek van organische stof in Nederlandse landbouwbodems* [Condition and dynamics of organic matter in Dutch agricultural soils] TCB A110 (2016)

[70] Monitoring Biobased Economy in the Netherlands 2015, no. 2016 D10576, March 2016

[71] Top Consortium for Biobased Economy Knowledge and Innovation (TKI-BBE) *Onderzoeksagenda Bio-based Economy 2015 – 2027* [Biobased Economy Research Agenda for 2015-2027]

[72] PBL policy memorandum *Voedsel voor de circulaire economie* [Food for the circular economy], 2016

producers and processors of biomass: for example, it is unclear which certification schemes should be used, since each buyer imposes different requirements that have to be met by producers. In addition, it is not always clear for producers which schemes can be used to designate an end product as sustainable. For this reason, coordination of the existing sustainability frameworks for biomass would be advisable. The existing biomass sustainability frameworks can be used as a point of departure to this end.

Biomass can compete with other raw materials in a lot of application areas. Biomass increasingly needs to meet sustainability requirements, whereas other raw materials are not scrutinized by any sustainability frameworks. This leads to unfair competition between biomass and other raw materials. For this reason, a single sustainability framework for all raw materials would be advisable:

- Harmonisation of biomass sustainability frameworks at the EU and international levels;
- Survey of sustainability systems and exploring options for a single sustainability framework for all raw materials;
- Facilitation of public-private collaboration initiatives involving biomass sustainability criteria in terms of standards, certification, and chain of custody (NEN and Green Deal Green certificates);
- Facilitation of voluntary sustainability reports for bio-energy producers, as a follow-up to the Sustainability of Solid Biomass Green Deal.

Criteria at the product level

In order to be able to ensure that circular biobased products can meet the sustainability requirements, the government will focus on producer responsibility, among other ways, through financial incentives, encouraging quality assurance, and hallmarks (for more details, see Chapter Four).

Criteria for cycles

In addition, integrated assessment methods will be developed and tested to assess sustainability, and the effectiveness and feasibility of loop closure measures. Wageningen University and Research Centre is developing a Cycle Test, specifically designed for the food cycle, which may be used by a range of stakeholders. This approach will be used as the basis for further action.

Future of Forests and Timber Action Plan

Representatives of the Dutch forest and timber sector are drawing up an Action Plan regarding the future of forests and timber, together with Nature organisations, which will be published in the autumn of 2016. This action plan addresses the question in the National Nature Vision, viz. how the forest and timber value chain can meet the growing demand for wood in a green circular economy, in an ecologically, economically, and socially sustainable manner. Within the Netherlands, expanding the production of timber by encouraging afforestation and a responsible growth of the timber harvest can make a significant contribution to CO_2 sequestration and the expansion of the domestic biomass supply. The Cabinet supports this initiative and strives to increase Dutch production of timber by encouraging afforestation and the responsible growth of the annual timber harvest.

Optimum utilisation of biomass and food

Residues

Biomass usage calls for optimum-level use of all elements and high-level reuse of (food) residues. However, the status of a residue is not always clear. Some residues are regarded as waste whereas they could be perfectly suitable to be processed into, for example, feed. To clarify this distinction and the associated conditions, a framework is being drawn up in collaboration with the sector, comprising guidelines for the business community and various supervisory bodies involved, such as the Netherlands Food and Consumer Product Safety Authority NVWA, the Human Environment and Transport Inspectorate ILT, and regional environmental authorities. In the pursuit of a level playing field across Europe, we are consulting with other member states and the European Commission regarding harmonisation of the substantiation of this distinction. Within Europe, the Netherlands is making a case for maximising the options for useful applications of raw materials, and preventing food residues from prematurely being regarded as waste.

Furthermore, CSR Netherlands is supporting entrepreneurs in the valorisation of residues in the agro sector, through the “Circular Enterprises Expedition”.

Actions to achieve optimum usage based on the Biomass Vision for 2030 include:

- Facilitating cross-sector collaboration aimed at high-level biobased business cases (Agro Paper Chemicals / Bio-renewables Business and sustainable biofuels platforms);
- Wherever possible, supporting private initiatives in the field of commodity formation of residues;
- Facilitating collaboration between minor timber suppliers and new wood-using sectors;
- Supporting the development of revenue models for biomass cycles by area organisations. This ties in with the IUCN/Nijenrode Green Finance Academy.

Cascaded use

In the aforementioned policy memorandum, the Netherlands Environmental Assessment Agency PBL advocates the adoption of cascaded use as a rule of thumb and providing room for a tailored approach. Following new developments and practical experiences with cascading, this policy concept is being continuously improved in order to

optimise its applicability to the reuse of biotic residues and food. Low-grade use of residues can sometimes yield more benefits than high-grade use: for example, if purification of polluted residues would require a great deal of energy. In addition, the multiple valorisation of residues could be given more consideration. This would improve the options for biomass usage and enable, for example, the production of recycled nutrients, soil improvers, energy or other base materials, along with food and feed.

Smaling motion and the elaboration of the commitment regarding cascaded use

The Smaling motion[73] requests the Cabinet to amend biomass policy in such a manner as to accommodate the considerations of the Royal Netherlands Academy of Arts and Sciences (KNAW). In its letter dated 23 January 2016[74], the Cabinet already commented on the KNAW views regarding the use of biomass, and indicated how these will be taken into account in bio-energy and biofuels policy. The Cabinet has promised the House of Representatives[75] that the 25 PJ of co-combustion of biomass in coal-fired power plants will be included in this elaboration, in order to be able to encourage the cascaded use of biomass and foster the circular economy, without compromising the achievement of renewable energy targets. The four actions set out below substantiate the motion and the aforementioned commitment.

Optimisation of SDE+ regulations

A study has been launched to explore whether regulatory obstacles in the Sustainable Energy Incentive Scheme + (SDE+) can be removed, in order to allow the use of bio refinery (residual) materials as a support fuel. The study specifically examines the approval of lignin as a fuel, whereby lignin is released as a residual substance in wood refinery. The use of pyrolysis, torrefaction, and carbonisation fuels has already been approved earlier. Consultations are underway with parties in the chemical and energy sectors in order to explore which components (other than lignin) could be approved. In accordance with the Biomass Vision for 2030, this will enable the shift from combustion to valorisation and combustion, and foster the biobased economy.

Combustion of waste wood

The aim is to allow less clean waste wood ("B-wood") as a fuel in some SDE+ categories. This will possibly reduce the amount of fresh wood and clean waste wood ("A-wood") that is used to generate energy (which will then become available for alternative uses). This issue is currently being studied. Important preconditions are that the current environmental requirements are met and that the efforts will not hamper the achievement of the targets for renewable energy and wood recycling.

Bio steam SDE+

Furthermore, consultations have been initiated with parties in the chemical and energy sectors to optimise the SDE+ category of industrial steam from wood pellets (bio steam). The replacement of gas-fired boilers by biomass boilers will considerably enhance the sustainability of the chemical sector. In addition, it offers opportunities for synergy in logistics value chains of sustainable biomass, the sharing of infrastructure/facilities, and the supply of industrial heat/steam between parties within industrial clusters (for example, in the industrial clusters in the ports of Amsterdam, Rotterdam, and Eemshaven).

ILUC biofuels directive

With respect to biofuels, the Indirect Land Use Change (ILUC) Directive allows member states, among other things, the freedom to set their own limits for the incorporation of conventional biofuels, with a maximum of 7%. The directive also comprises an indicative sub-target of 0.5% for the most advanced biofuels. The implementation of the ILUC Directive marks is an effective step towards enhancing the sustainability of biofuels and the promotion of advanced biofuels. In the autumn of 2016, the Minister for the Environment will inform the House of Representatives about this in more detail.

Loop closure

Nutrients cycle and soil quality

Together with the agriculture and waste sectors, we are exploring potential measures for enhancing the volume of stable organic matter in the soil, for example in order to recover organic matter from residues, improve soil quality, sequester carbon in the soil, and counteract soil subsidence. This ties in with the French *4 pour 1000* initiative aimed at increasing the proportion of organic matter in the soil by 0.4 percent annually for the purpose of improving soil fertility, food security, and achieving the Paris climate targets. The Netherlands supports this initiative.

Fertilisers Regulation

There is a huge potential for the recovery of nutrients such as phosphate from residues such as manure, waste water and purification sludge, and from industrial processes, thus contributing to the development of a circular economy. The proposal presented by the European Commission to review the Fertilisers Regulation expands the harmonisation of the trade requirements for artificial fertilisers to organic fertilisers, soil improvers, and growth media. This can create more room for the production of artificial fertilisers from secondary (recycled) fertilisers, such as base materials

[73] Parliamentary Documents II, 30.196, no. 445

[74] Parliamentary Documents II, 30 196, nr. 293

[75] General Consultations, 23 March 2016

from waste (water), compost, digestate, animal manure, and other animal by-products. For example, in the future the Fertilisers Regulation may enable the EU trade of recovered fertilisers such as struvite without a waste label but with a CE marking. These products thus lose their waste status and, in addition, reach their final status under the Animal By-products Regulation. This removes some significant obstacles to the reuse of these products.

Under the Dutch presidency, the consideration of this Regulation was initiated. The proposal is expected to be adopted in 2018. Expanding the scope of this Fertilisers Regulation to include these new fertilising products, and the possibility of using residues to this end renders the Netherlands less dependent on fossil resources (such as natural gas, phosphate, or potassium), some of which have been designated as critical by the Commission. In addition, organic fertilisers may make a positive contribution to increasing the organic matter content of the European soils.

Nutrients platform

In collaboration with the Nutrients Platform, the Cabinet is working on the creation of a European and global market for recycled nutrients in sustainable agriculture, focused on knowledge exchange and development regarding sustainable innovations and setting up smart coalitions/ partnerships. This will be substantiated by permanent support to the implementation of the Ambitie Nutriënten 2018 [Nutrients Ambition 2018] of the Nutrients Platform (a comprehensive agenda that also considers the relationship with micro nutrients, organic matter (humic acid), and soil improvement). This Ambition comprises, for example:

- an exploration of the options and opportunities for recycling and sustainable reuse of nutrients other than phosphate and organic matter;
- potential supplementary and effective policy measures aimed at the substantial expansion of the use of recycled nutrients.

At the international level, the Cabinet continues to invest in strengthening the *European Sustainable Phosphorus Platform* and the *Global Partnership on Nutrient Management*. Additional efforts will be expended on the implementation and further development of *international Green Deals* aimed at promoting an international market for recycled nutrients. Furthermore, the Cabinet will promote the development of international Green Deals aimed at combining balanced precision fertilisation with nutrients cycle closure, and the support of circular agriculture in Eastern and Southern Europe (cf. Paragraph 4.5).

Replacement of fossil resources by biomass (biobased economy)

In addition to comprehensive energy and climate policy, the focus on biobased economy will be continued, among other ways through Top Sector policy. Manufacturers of chemicals, plastics and other materials (such as paper, building materials, et cetera) would like to see an integration of renewable energy and climate adaptation policies by focusing on a single parameter, viz. CO_{2eq}. For more details, see the measures outlined in Paragraph 4.2.

Chemical production in the Netherlands based on biomass: "green chemistry"

The sector has requested better incentives, in particular for the investments in the first commercial biobased plants in the Netherlands. Companies assess potential locations on the basis of a combination of clustered facilities and financial support, for example, in combination with the production of renewable energy (under the SDE+ arrangement) or biofuels (through the blending requirements). Consortia have entered into a dialogue with the government regarding upcoming investments in the development of, inter alia, sugar chemistry, timber refinery, and pyrolysis. In consultation with the regions, the existing tools will be used to the full in order to support companies with concrete biobased investment plans. We are exploring potential tools to be developed supplementary to the aforementioned investment fund in order to realise these investments in the Netherlands.

5.2 Plastics

5.2.1 Why this priority?

Increasing use

The use of plastics has increased twentyfold over the past fifty years. Expectations are that plastic use will double once again in the twenty years ahead. The worldwide production of plastics has risen to 299 million tons in 2013, approximately 20 percent of which are produced in Europe. The majority of plastics are used in packaging. In Europe, their share accounts for nearly 40%. At the same time, increasingly more biobased and biodegradable plastics are marketed, as an alternative to fossil plastics.

Urgency for the environment

The range of applications for plastics has expanded enormously: from industry to households, from food packaging to wind turbines. This can be attributed to the diversity of material properties, such as a low weight and relative strength. In the food processing and food packaging sectors, plastics have contributed to the improvement of hygiene and product shelf life. A major challenge with respect to plastics is reducing the dependency on fossil resources. In addition, large volumes of plastic end up as

Ocean Cleanup stands out to sea

‘Even in high school, I was concerned about the plastic soup issue. I went diving in Greece, and during my trip I encountered more plastic than fish. In my TEDx talk – I was 18 at the time – I already announced my intention to tackle plastic waste in our seas and oceans. “Why would we move through the ocean if the ocean can move through you”; that became my motto. In 2013, I founded The Ocean Cleanup.’

‘This summer – with significant financial support from the national government – we placed a purification unit in the North Sea, 23 kilometres off the Scheveningen coast. A 100 m long prototype, enabling the large-scale removal of plastics from our seas and oceans. This is the first test of this kind in open waters.’

‘The set-up will be tested for an entire year. The prototype will thus be subject to every season, including the dreaded North Sea storms. Such circumstances do not occur in the Pacific in a hundred years. Sensors measure whether the movements of the floating barriers behave according to the advance calculations, and monitor whether they can withstand extreme weather conditions.’

‘I went diving in Greece, and during my trip I encountered more plastic than fish.’

‘If this works out, we will place a 100 km plastic catcher in the Pacific Ocean, between California and Hawaii, in 2020. In 10 years’ time, this could clean up approximately half of the plastic soup in this section of the ocean.’

Boyan Slat

Founder and CEO of The Ocean Cleanup

litter, which does not belong on the streets or in the oceans. One property of plastic is that it takes a long time to degrade, or it hardly degrades at all. In water, plastic gradually degrades into increasingly smaller (micro and nano) particles. These particles – that can attract toxins – eventually affect the ecosystem and end up in our food system (through, for example, birds and fish).

Potential for increased recycling

The separate collection of plastic waste is currently a hot issue. Yet plastic recycling in the Netherlands lags behind considerably compared to the recycling of other material flows. Only 34% of all plastics were recycled in 2012. A particular improvement can currently be observed in the recycling of discarded plastic packaging, from 42% in 2012 to 50% in 2014. The target is 52% by 2017. The plastic recyclate released can and must be used more efficiently and on a larger scale in the entire market.

Complex plastics market

The plastics market comprises a wide range of plastics, and features a fragmented playing field with many small actors. A great deal of plastic waste is still incinerated or exported, resulting in considerable loss of value and failure to close the loop. The development of the market for recycled plastics is still in full swing. Pure flows (in particular, PE, PP, and PET) have a positive value; their collection and recycling can be cost-effective. Recycling of mixed flows and foils is not yet cost-effective. Furthermore, providing assurance to customers in the product value chain regarding consistent quality ("grades") appears to be difficult. With respect to composites (fibre-reinforced polyester, et cetera), good and cost-effective recycling methods are not yet available.

5.2.2 Vision for 2050

In 2050, 100% renewable (recycled and biobased) plastics will be used without any harmful impact on the environment, wherever such is technically feasible. Plastics retain their value, products have been designed in a circular manner, we no longer depend on fossil resources for the production of plastics, CO_2 emissions have been reduced drastically, and plastic litter is combated effectively. New markets for innovative plastic recycling and biobased businesses have opened up, circular business models have evolved, and there is a solid market for recycled plastics. International collaborations have been set up in order to close the plastics value chain across the globe and thus contribute to strengthening our natural capital.

5.2.3 Strategic goals

The realisation of this perspective on a national and international scale requires that:

1. Plastic products are designed in such a manner as to enable reuse and high-grade recycling after being discarded;
2. Plastic materials in value chains are utilised as efficiently as possible, which would lead to a reduction in the need for raw materials and the prevention of "leakage" in the system;
3. Optimisation of the renewable use of plastic material flows, by large-scale usage of plastic recyclates and biobased plastics, making use of biodegradable plastics in specific situations in which such plastics have added value for the circular economy (more effective joint processing with biotic residues; pollution risks for the marine environment).

5.2.4 Ongoing efforts

VANG and plastics

Within the framework of the VANG [From Waste to Resources] programme, significant steps have been taken over recent years towards closing the plastic cycle. Under the *Raamovereenkomst Verpakkingen II 2013-2022* [Dutch Agreement on Packaging], notable results have been achieved, with a considerable increase in the proportion of collected and recycled plastic packaging. This proportion has currently already risen to 50%.

Upscaling of bioplastics production

Bioplastics constitute a growing international market, in which Dutch companies rank among the leaders with respect to production and processing. Several innovation programmes have provided support, for example, the Biobased Performance Materials programme. Upscaling is also fostered by Green Deals, such as the Green Deal on the Raw Materials of the Water Boards that is working on bioplastics (PHA) from sewage sludge.

The Cabinet supports the ambitions of the business community to set up large-scale commercial production of renewable plastics in the Netherlands. Various chemical clusters in the Netherlands view this as a key route in improving the sustainability of the chemical sector, which will bring the 2030 target closer.

Value chain agreement on plastic cycles

In 2013, at the initiative of the Ministry of Infrastructure and the Environment, the national government concluded a *Value chain Agreement on Plastic Cycles* with 55 parties involved in the plastics value chain. This network (which has meanwhile grown to comprise more than 90 parties), shares knowledge and experience and look together for opportunities for innovation. In addition, various stakeholders are collaborating on value chain projects involving the use of recycled and biobased materials. The parties have also jointly developed guidelines for the circular design of plastic products (involving, inter alia, the use of plastic recyclates).

Plastic bags

With effect from 1 January 2016, giving away free plastic bags is prohibited in the Netherlands. This ban has been implemented in the context of a comprehensive policy to reduce the use of all carrier bags. This approach is the substantiation of the EU directive aimed at reducing the use of plastic bags, and thus the prevention and reduction of plastic litter on land and in the oceans (see Paragraph 5.5).[76]

Plastic litter in the oceans

The efforts to clean up and prevent (plastic) litter in the oceans are expended under the Programme of Measures for the implementation of the Marine Strategy Framework Directive (KRM), whose point of departure is an effective source policy (prevention is better than cure) and which comprises a micro plastics policy. Actions to retrieve plastic from the oceans, such as the international The Ocean Cleanup initiative, are actively supported.

Monitoring of plastic flows

In order to be able to conduct a focused substantive discussion in the years ahead, proper monitoring of the plastic flows (production – usage – discarding – processing) is essential. In 2016, a start was made with the design of a monitoring system.

5.2.5 Planned actions

Changing designs

The Cabinet endeavours to expand and intensify the *European Ecodesign Directive* aimed at increasing the use of plastic recyclates, upcycling, longer shelf lives, and improved repairability of plastic products. Together with other member states, the Netherlands is going to explore how this European approach can be supported and accelerated. Together with the NEN Institute, more CEN/ISO certification tracks will be developed in order to enhance confidence in plastic recyclates.

The programmes aimed at promoting circular design will also be tailored to companies in the plastics sector, based on the aforementioned guidelines for designing with plastic recyclates. The body of thought underpinning the concrete approach and the results of these design programmes and guidelines will be disseminated on an international scale in order to inspire others to initiate similar projects.

Discouraging use of non-recyclable products

The Cabinet is developing a set of tools to phase out certain environmentally harmful products (or components of products), especially those for which good alternatives are already available. Products the Cabinet is considering in this respect include superfluous or non-recyclable packaging (multilayer packaging, such as for crisps and soup). It goes without saying that any alternative must meet the same primary requirements, such as prevention of food decay. This will be addressed as a substantiation of European policy. Together with the Sustainable Packaging Knowledge Institute KIDV and others, pioneering tracks will be rolled out aimed at developing sustainable circular designs.

Innovation

Innovations aimed at returning plastics into the cycle at the highest level possible will permanently be fostered throughout the plastics value chain through the network set up under the plastic cycle value chain agreement. This specifically pertains to waste prevention, the design of plastic products, and the development of alternatives (to, for example, multilayer packaging). A quality assurance system for "grades" must be set up (consistent composition) and the possibilities for mechanical and chemical recycling of (composite) materials need to be explored in more detail. An important point of attention with respect to closing the loop is mutual confidence in the product supply chain. The Cabinet will make an effort to create cooperation and commitment.

The Chemical Top Sector has rolled out the Biobased Performance Materials programme. Under this programme, companies and knowledge institutes are working on improving the quality of bioplastics and the expansion of their uses.

Usage of renewable (recycled and biobased) materials

More production companies (brand owners) will be involved in the finalisation of the plastics cycle value chain agreement in order to upscale market demand for recycled and biobased plastics through voluntary arrangements (such as those made under the Eco label). Furthermore, circular procurement by both governments and large companies will further support (European) market demand. International Europe-based companies are encouraged to adopt circular procurement at the global level.

Within the framework of the plastics transition agenda to be drawn up, the Cabinet aims to explore, together with private sector parties, to what degree renewable plastics, recyclates, and biobased materials can be incorporated into the production process. On the basis of this data, target figures will be set down, together with the plastics sector, that can be adapted to the technological feasibilities of blending in these renewable plastics. The study will also

[76] Directive (EU) 2015/720 of the European Parliament and the Council dated 29 April 2015 to amend Directive 94/62/EC concerning the reduction of the use of light-weight plastic carrier bags.

consider the options for setting down agreements on a conversion to biodegradable plastics, as requested in the Van Gerven motion.[77]

Manufacturers marketing packaged products pay a fee to the Packaging Waste Fund (Afvalfonds), which is used to pay, inter alia, collection and recycling costs. One of the items on the transition agenda may involve a positive financial incentive for companies marketing products packaged in plastic in order to encourage the use of these renewable materials. Such an incentive may be created by differentiating the rates that currently apply to plastic packaging, which would increase the demand for such renewable materials. This market incentive will be explored during the evaluation of the outline agreement, in consultation with the outline agreement parties. Subsequently, if it is in line with the transition agenda, and the wishes and possibilities of the outline agreement parties, further agreements will be made in this regard.

Uses of biodegradable plastics

Furthermore, the Cabinet is focusing on clarifying the potential uses of biodegradable plastics that may be composted or fermented in their end-of-life phase. Such uses may be found in, e.g., the food value chain and the medical sector. Biodegradable plastics are used increasingly and specifically in cases involving high risks to the environment. Clarity towards consumers, municipalities, and the waste and recycling sector as to how to deal with the various types of plastics is essential.

A study is currently underway into biodegradable plastics in relation to the existing and future recycling market, in which the consumer perspective (simple explanations of the ways in which various materials can be presented to waste collectors) and the combat of litter aspect are taken into account. In 2017, this study will generate a Cabinet view on bioplastics, and serve as input for the EU Strategy on Plastics that will be presented by the European Commission at the end of 2017.

International closure of the plastics value chain

The Netherlands has taken the initiative to organise an EU conference on Plastics in December 2016, which will serve to share knowledge and experience regarding innovations, to strengthen European networks, and explore ways to close the loop at the European and global levels.

The plastic soup issue that is growing all across the globe needs to be tackled, but also offers opportunities for the Dutch business community in the maritime, waste, and recycling sectors to valorise our knowledge and expertise in the field of plastics clearance (through various dredging systems), but also regarding the prevention of marine litter by circularising local and regional cycles. An example of this is the *Clean Urban Delta Initiative Rio de Janeiro*[78], ensuing from the plastics value chain agreement network. In the years ahead, this integrated approach towards the circular economy will be rolled out in other urban deltas via subsequent climate adaptation missions, such as the Cabinet mission to Indonesia in November 2016.

Opportunities will also be explored for upscaling national Green Deals (such as the one pertaining to the Shipping waste value chain) and the *Plastics Cycle Value Chain Agreement* to the European and global levels in the form of International Green Deals (cf. Paragraph 4.5).

5.3 The manufacturing industry

5.3.1 Why this priority?

Sectors such as electronics, machinery and systems industry, automotive industry, electric transport, aerospace, and sustainable energy technologies use increasingly more raw materials due to a growing demand for products and services.[79] Across the globe, extraction and processing of these raw materials cause environmental and climate issues as well as other sustainability problems. At the same time, the supply of raw materials such as scarce metals is particularly limited. Such raw materials originate from only a few source countries and conflicts hamper accessibility of the supply. Moreover, raw material extraction is becoming increasingly laborious as a result of, inter alia, declining ore quality. Another challenge is the required short-term upscaling of metal and mineral extraction in light of the rapidly increasing demand for metals and minerals. Mining projects involve a long start-up. Without a change in policy, the relatively limited availability of certain raw materials will lead to increasing dependency and geo-political tension, while negatively impacting companies as well as regional and national economies.

[77] Parliamentary Documents II, 30 872, no. 140

[78] See footnote 62.

[79] TNO, follow-up study *Materialen in de Nederlandse economie* [Materials in the Dutch economy], December 2015; Rene Kleijn, Ester van der Voet, 21 July 2010, *Resource constraints in a hydrogen economy based on renewable energy sources: An exploration*, Elsevier. And: René Kleijn et al, 1 July 2011, *Metal requirements of low-carbon power generation*, Elsevier; Joint Research Centre European Commission, *Critical Metals in the Path towards the Decarbonisation of the EU Energy Sector*, 2013

A source of concern is that most businesses pay relatively little attention to the topic of supply security and the role a circular economy could play in this respect. This calls for raising awareness and new revenue models that reduce dependency on raw materials and thus the environmental impact.

5.3.2 Vision for 2050

The Cabinet is advocating a gradual development towards a high-quality circular manufacturing industry, in which the demand for (scarce) raw materials is met by raw materials from the value chain wherever possible.

By 2020, the Dutch business community will be well informed about the vulnerability of natural resources and supply security. Dutch companies see the opportunities arising from an overall European raw materials infrastructure. This will accommodate the growing demand for metals and minerals ensuing from the energy transition.

By 2050, critical metals such as rare earth metals will be upcycled at a large scale, for example, in industrial material pools in Europe. In addition, a highly sustainable rare earth metals mine will have been opened in Europe under the EU Raw Materials Initiative. The "urban mine" (built-up environment as a "mine" for new raw materials) will have been exploited and accounts for a substantial proportion of high-grade industrial raw material flows. A considerable part of the material needs of basic facilities in the Netherlands will have been met.

The use of foreign raw materials will have been reduced dramatically and remains within the capacity of the Earth. Supply security issues will have been resolved by the shift from fossil to renewable raw materials, and from "critical" metals and minerals to generally available ones. In addition, efficiency will have been enhanced in all the steps of the value chain, and high-grade reuse of metals will have become the standard.

5.3.3 Strategic goals

The vision above has been translated into five strategic goals for the circular manufacturing industry.

Shift from critical raw materials such as metals and minerals to generally available raw materials

Many companies use critical metals and minerals for their increasingly complex products. As this entails long-term risks, we need to explore ways of using generally available metals and minerals as substitutes.

Increasing efficiency and high-grade sustainable reuse of metals and minerals in all steps of relevant value chains

In 2016, TNO assessed the options for a more efficient and smarter use of metals in over 1000 products. This could generate considerable material savings and added value.

Developing new ways of producing/consuming

The future global economy of products and services calls for large volumes of primary raw materials and energy. Accordingly, we will need new production and consumption systems using sophisticated printing technologies (for example, printing food) and includes products made of self-healing and shape-shifting materials that prolong their shelf life.

Bundling public and private demand for circular products and services

Along with the supply side, the demand for circular products and services will need to increase in order to complete the circular business cases. Companies and governments play a key role in this by adopting socially responsible procurement.

Shift from fossil to renewable raw materials

In the near future, fossil carbons can largely be replaced by short-cycle carbons. This has already been achieved on a small scale with heavy chemicals such as ethanol, methanol, butanol, and acetic acid. When properly used, this contributes to reducing CO_2 and reduces dependency on scarce or volatile raw materials.

5.3.4 Ongoing efforts

Over recent years, the Cabinet has focused, often in collaboration with the Top Sectors, on the development and dissemination of knowledge relating to supply security. The ongoing projects and/or activities are listed below.

CBS Material Flows Monitor

The CBS [Statistics Netherlands] Material Flows Monitor is used in the follow-up study *Materials in the Dutch economy: supply security risks for 64 metals and minerals*, the development of a self-assessment tool for businesses, the *Circular potential of product groups* study, the *Raw Materials and the Circular Economy Knowledge Plaza* website to be launched, and the design of a regional tool to promote regional circular business models. In order to provide insight at the company or value chain level into the relationship between the use of raw materials and natural capital, application of the Natural Capital Protocol will also be promoted.

A smartphone with social values

‘Fairphone was launched in 2010, as an awareness campaign. Two years later, some individual employees decided to take it to the next level and establish an independent company, with financial support from Waag Society.’

‘Reflecting on design is a means to reform systems …’

‘Fairphone is currently a social enterprise, based on the idea of establishing a movement towards more honest electronics. We expose the production and distribution systems, thus revealing how smartphones are made and what challenging issues are involved. This gets a debate going on what is actually fair. Social and ethical values are leading in this respect. Thus we have a positive impact on the entire value chain: the design, the production and the lifecycle of a smartphone.

‘Personally, I am driven by the concept of sustainability. Reflecting on design is a means to reform systems, to actually bring about a better, more honest world. Fairphone is not just a movement. It is also a product and a company. This enables us to launch a wide range of activities, from the development of long-lasting, sustainable products to the use of honest materials.’

‘We are attempting to gradually upscale our production to an average annual sales level of some 100,000 phones a year. This would have to provide us with sufficient scope to achieve our social and environmentalist ideals in the long run. It is important for both the government and other companies to realise that they have to keep creating conditions to boost businesses that have already embarked on sustainability.’

Miquel Ballester

Co-founder of Fairphone

CIRCO Project

The aforementioned *Creating business through circular design* CIRCO project has been initiated by CLICK NL, the Top Consortium for Knowledge and Innovation for the creative industry. This project involves workshops to help entrepreneurs and designers in the manufacturing industry set up the development of new circular products, services, and business models.

Circular Metal Value Chain initiative

The *Circular Metal Value Chain* initiative ensued from the VANG [From Waste to Resources] programme. Under this initiative, all the value chain partners (raw materials trade, tooling, processing, (manufacturing) industry, and recycling) collaborate with training institutions, knowledge institutes, and government parties in concrete projects to achieve high-level circular objectives, in terms of both quantity and quality.

Top Sectors roadmaps

Top Sectors roadmaps with innovation targets and associated programme line up to 2020, fostering the transition to a circular economy. The roadmaps pertain to sectors such as *High Tech Materials*, *Lighting*, *Solar*, *Printing*, *Automotive*, and *Aeronautics*. The cross-sectoral *Smart Industry* roadmap, published in May 2016, focuses on the technological challenges and opportunities that are conducive to the development of a circular economy.

EU Conflict Minerals Regulation

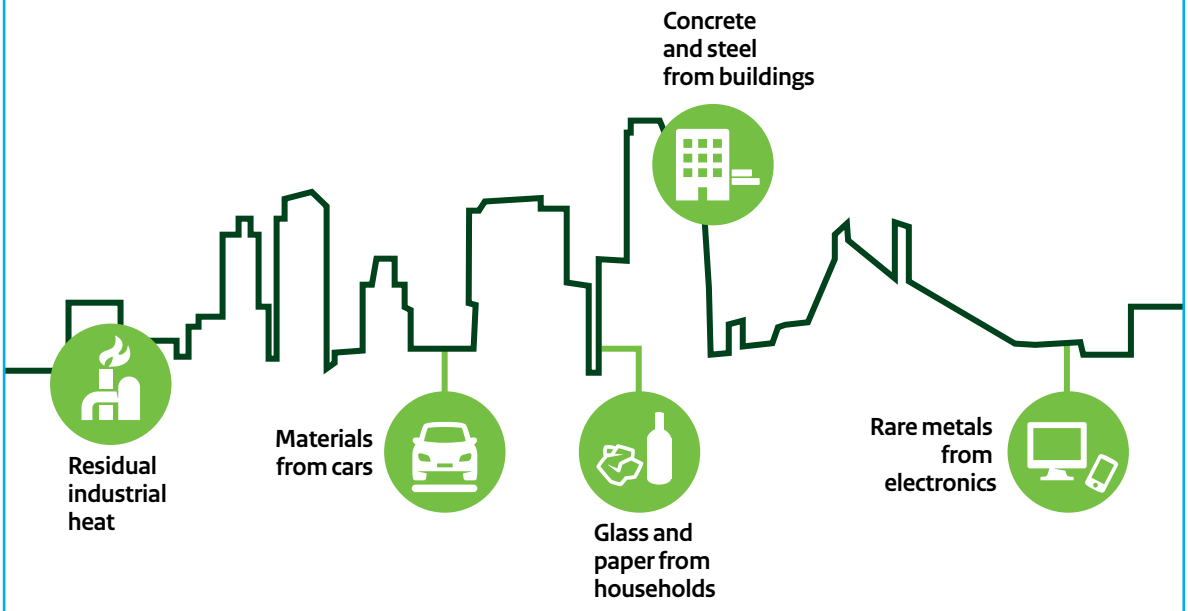
The EU Conflict Minerals Regulation was endorsed on 16 June 2016. This Regulation is aimed at breaking up the link between the trade in certain[80] minerals and the funding of violent conflicts in the areas in which such minerals are extracted. The Dutch Ministry of Foreign Affairs has assisted in setting up a sustainable tin value chain. A similar value chain is being developed for gold.

Routes: Smart Industry, Circular Economy and Materials

Under the Dutch National Research Agenda, so-called "routes" are being developed comprising inter-related cluster questions concerning topics such as *Smart Industry*, and *Circular economy and raw materials: sustainable circular impact*.

[80] 3TG: tin, tungsten and tantalum, and gold.

The urban mine



Source: PBL; http://themasites.pbl.nl/circulaire-economie/

5.3.5 Planned actions

The actions planned to achieve circularity in the manufacturing industry have been bundled into eight operational goals.

By 2020, 50% of the businesses must be aware of the risks and opportunities involved in metals, and have taken steps towards circularity

Many medium-sized and small businesses are unaware of potential risks involved in the supply of raw materials, such as supply interruptions and risks related to Corporate Social Responsibility. In addition, awareness of the possibilities for boosting the circularity of products is only limited. For that reason, we are committed to the long-term operation and further development of the *Raw Materials Knowledge Plaza*, including a self-assessment tool.

Companies will benefit from a long-term strategy for the supply security of critical raw materials. To facilitate this, the Ministry of Economic Affairs has commissioned the development of a so-called "*Raw Materials Knowledge Plaza*", a method and IT tool to map out business risks. This will become available at the end of 2016. The further development of the Knowledge Plaza will comprise several additional functionalities, including a helpdesk function, trends monitoring, and an information desk for other EU countries. Expanding knowledge regarding risks and opportunities must induce SME companies to take action sooner.

Development of promising business models focused on energy-intensive products with circular potential and substantial export prospects

The Cabinet aims to encourage the development of circular business models and explore, together with the manufacturing industry and in close collaboration with the creative industry, energy-intensive products with circular and economic potential. To this end, promising circular business models are being developed in five product groups.

TNO has mapped out promising product groups in its report entitled *Circulaire potentie van producten* [Circular potential of products]. The focus will be on the top 5 of these product groups, with high circular potential and a large energy impact. Raw materials savings thus go hand in hand with achieving climate targets. This could be a concerted effort by value chain partners (Circular Metal Value Chain, comprising sectors such as the manufacturing and creative industries).

The Netherlands takes initiative for EU approach regarding risk management of the supply of several metals by sustainable extraction

The Netherlands is going to initiate the establishment of a European Partnership for responsible minerals. The exploration phases of the ICSR Covenants pertaining to tungsten and tantalum, to be concluded by the Netherlands Metallurgy Industry Association VNMI and the FME technology industry employers' organisation, offer opportunities for improving the sustainability of value chains and tapping new urban mines. This Dutch initiative is aimed at expanding the demand for and supply of responsible minerals in order to encourage sustainable development in development countries with mining prospects. The partnership will also contribute to enhancing the supply security of raw materials in this trade value chain.

Meeting material needs by national and international reuse

Discarded products, buildings, and infrastructure contain large amounts of materials suitable for reuse: the *urban mine*. An active focus on the rapid reuse of residues should cover part of the Dutch need for new raw materials. Investments in opening up this urban mine will foster the development of a new raw materials market.[81]

Boosting the EU Raw Materials Initiative (RMI)

The RMI comprises three pillars, viz.:

1) access to raw materials in international markets;
2) sustainable mining in Europe;
3) raw materials efficiency and reusable materials through recycling.

One of the conclusions drawn during the European Raw Materials Conference held in April 2016 was that this initiative must be underpinned by an integrated knowledge infrastructure regarding raw materials supply security and circular economy. Furthermore, Europe could mine one of the last scarce earth metal supplies in European soil, the Norra Karr deposit in Sweden, in a highly sustainable manner. The Water and Mining Platform gathers Dutch expertise in order to facilitate such sustainable mining.

Development and implementation of a pilot involving e-waste as an existing urban mine

The CBS [Statistics Netherlands] study entitled *Green Growth in The Netherlands 2015*, presenting research data concerning electronic waste, will serve as the basis for exploring options for developing business cases in the Netherlands, together with parties such as WeCycle.

Development and implementation of a pilot involving new sustainable urban mines in collaboration with the maritime sector

In its design of ships and platforms, and in its choice of materials, the manufacturing industry can contribute to the reuse of materials, reducing the use of scarce raw materials, and reducing the environmental burden. The EU and the national governments can promote the sustainable

[81] See footnote 5

dismantling and recycling of ships and recreational vessels. An EU Ship Recycling Regulation has been created to this end. Within the next 15 years, 75,000 scrap ships will be taken out of service.

The Maritime Manufacturing Industry 2016 – 2018 action programme, a joint effort of the business community and the government, sets out a number of concrete actions that give impetus to the ambition of developing sustainable products and solutions, and contribute to achieving a circular economy. For example, a plan will be established for cleaning up the ocean and keeping it clean by removing pollutants such as plastics and micro plastics, and the regulations pertaining to the environmentally responsible and safe recycling of ships will be actively enforced.

Implementation of a strategic track with businesses and knowledge institutes involved, aimed at a long-term strategy for raw materials supply security

Analyses have revealed minor and major vulnerabilities in the Dutch economy with respect to raw materials supply security involving metals and minerals. On the basis of the raw materials scenarios of the International Resource Panel, we will explore, together with relevant businesses and knowledge institutes, how the raw materials supply security of the manufacturing industry is changing and what strategies can be employed to boost it. The metals and minerals required for the energy transition and climate adaptation will explicitly be taken into account in this study.

Green Deals to be concluded with sectors and value chains that are vulnerable in terms of supply security

Green Deals may help expand the use of sustainably produced raw materials, including recyclates and biomass. This calls for support for the development of an equivalent sustainability framework (level playing field) for all raw materials, including fossil ones.

Together with businesses and knowledge institutes, we will seek leads in the various roadmaps to accelerate the transition to a circular economy. Our aim is to set down a circular economy agenda within the Top Sectors (cf. Paragraph 4.3). Several round tables will be organised to this end. A source of inspiration is the *Remanufacturing* roadmap published by High Tech NL in 2013.

The energy transition involves an increase in the use of critical materials for generators, for example, in wind turbines. The Social and Economic Council of the Netherlands (SER) has also requested attention to be paid to this issue. With a view to the expected further increase, options for drawing up a (circular) roadmap will be explored under the Top Sectors policy.

Under the *Electric Transport 2016-2020* Green Deal, the application of circular principles will be considered within the cross-sectoral topic of *electric transport* (High Tech Systems & Materials, Chemical Industry, Energy, and Logistics). The reuse of batteries provides concrete opportunities.

5.4 Construction sector

5.4.1 Why this priority?

Scope

Resource intensity in the construction sector is high. The construction industry is estimated to account for 50% of the raw materials used, 40% of total energy consumption, and 30% of total water consumption in the Netherlands. In addition, a large proportion of waste in the Netherlands (approximately 40%) involves construction and demolition waste, while the sector is responsible for approximately 35% of CO_2 emissions.[82]

The construction sector is distinguished in Commercial and Non-residential Building (*Burgelijke en Utiliteitsbouw* - C&NRB) on the one hand, and Soil and Civil Engineering (*Grond-, Weg- en Waterbouw* - S&CE) on the other. One of the reasons why this distinction is relevant relates to the difference in structure: C&NRB largely involves private funding and a large, diverse playing field with many (major and minor) stakeholders. S&CE often involves public commissioning and features a smaller number of more homogenous stakeholders.

Degree of circularity

The reuse of C&NRB construction and demolition waste is already widespread (>95%), albeit that in many cases materials are not reused at the same or a higher level. The reuse rather involves, for example, construction rubble being processed to granulate to be used as a foundation material in S&CE. The bulk of the material is subsequently reused at the same level in the S&CE sector; after one road life cycle, the rubble is reusable in other road projects.

The need for such foundation material in the S&CE sector is expected to decrease, as this sector increasingly tends to use residual material from other sources. This “saturation” in S&CE generates an incentive for developing more circular uses for construction materials in the C&NRB sector.

[82] http://www.ellemmi.nl/grote-duurzaamheidsopgave-voor-bouw-sector/.html

5.4.2 Vision for 2050

The introduction of a circular economy in the construction sector creates opportunities for innovation. The construction sector focuses increasingly on energy savings and reduction of CO_2 emissions, in both the construction and the operational phases of a building. Opportunities arise for cutting down on raw materials and reducing residual and waste matter. In addition, the circular economy can generate quality improvement and cost reduction throughout an object's life cycle.

This leads to the following vision:

By 2050, the construction industry will be organised in such a way, with respect to the design, development, operation, management, and disassembly of buildings, as to ensure the sustainable construction, use, reuse, maintenance, and dismantling of these objects. Sustainable materials will be used in the construction process, and designs will be geared to the dynamic wishes of the users. The aim is for the built-up environment to be energy-neutral by 2050, in keeping with the European agreements. Buildings will utilise eco system services wherever possible (natural capital, such as the water storage capacity of the sub-soil).

The scope of a circular economy for the construction sector extends beyond the mere reuse of waste. A circular economy for the construction industry calls for the following three questions to be considered with respect to each building:

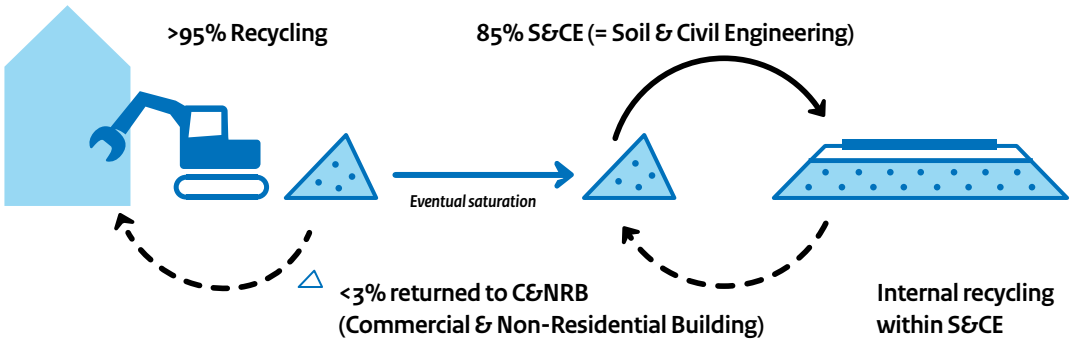
1) How can we minimise the use of construction materials? This involves not only the need for raw materials, but also the options for reuse and transformation of the building itself;
2) How can we meet the remaining material requirements as sustainably as possible? The use of sustainable construction materials should be considered here, as should reuse;
3) How can we meet the material requirements still remaining as efficiently as possible?

These questions also show that higher scale levels also play a part in a circular economy for the construction sector: the function of buildings and even urban development.

5.4.3 Strategic goals

The Cabinet wants to link the circular economy efforts in the construction sector to actions that are already (partially) underway. It is the Cabinet's intention to have circular economy activities in the construction sector tie in, wherever possible, with the energy objectives in both

Circular economy in the construction sector



Source: Rijkswaterstaat and National Institute for Public Health and the Environment RIVM (2015), Policy exploration regarding circular economy in the construction sector. Figures are indicative on the basis of Hofstra et al (2006), Scenariostudie BSA-granulaten, aanbod en afzet van 2005 tot 2025 [BSA granulates scenario study, supply and sale from 2005 to 2025]

A healthy work environment, a healthy employee

‘Ten years ago, we changed course. Since then, we have implemented all our projects on a Cradle-to-Cradle basis. A prime example is Park 20|20, a Cradle-to-Cradle Business Park, developed by Delta, and its partners VolkerWessels and the Reggeborgh Groep, which is focused on both people and the environment. To achieve this, we have taken an integral approach to all the flows (energy, water, biodiversity, et cetera), and used sustainable C2C materials. This manner of construction not only generates a pleasant office but also a healthy living environment, which promotes productivity among employees and reduces absence due to sickness.

As real estate developers, we saw the market change, for example, through the advent of flexiwork. However, society and the environment are also changing, as our planet accommodates increasingly more people and the supply of resources continues to decline. We can change this.

Circular processes ensure that our resources remain intact. I firmly believe that everyone who is in a position to leave the world a better place for our children should do so. It is our good fortune, as developers, that we can create tomorrow’s world.

‘... a pleasant office but also a healthy living environment, promotes productivity and reduces absence due to sickness.’

Our next goal is the Valley development, a business development environment near Amsterdam Airport Schiphol, where we are joining forces to accelerate the circular economy. I would like to widely share the knowledge and experience we are gaining there. The government is indispensable in this regard. Not as a facilitator, but in a participating capacity, playing an active role in the community.’

Rob van den Broek

Sales Director, Delta Development Group

existing and new C&NRB and S&CE buildings and structures. Efforts may be paired in the renovation and transformation of the existing supply, for example, from offices to residential buildings. High-grade reuse can assist in obtaining funding for transformation or demolition, or for new construction projects. To realise its vision, the Cabinet has elaborated a set of strategic goals, in which the goals set out in the Biobased Economy Vision for 2030 have been factored in:

1) C&NRB and S&CE to use (mainly) renewable raw materials;
2) Optimising the use of material throughout the building's life cycle (value preservation, cost savings, more reuse, lower environmental impact);
3) Minimising CO_2 emissions by the construction sector, in both the construction and the operational phases;
4) As an innovative sector, the construction sector must proactively respond to changes in society as well as private sector and consumer demands.

Another option is the deployment of legislation; the point of departure in this respect is that the Cabinet will refrain from setting down any new legislation that would add to the financial burden. The National Building Decree, for that matter, contains restrictive provisions regarding the environmental impact.[83] It also contains provisions regarding the separation of construction and demolition waste. The legislation applicable to the construction sector do not yet set out any specific provisions regarding resource efficiency.

Key preconditions in the implementation of this policy are that the construction sector assumes its own responsibility, and that the government provides a level playing field, contributes to the acquisition and safeguarding of knowledge through pilots, and provides limited support wherever such is required and advisable. Principals and building users play an important part in this. The strategic goals will be substantiated in more detail following consultations with the relevant NGOs, in the context of the aforementioned transition agenda.

5.4.4 Ongoing efforts

The circular economy is not yet generally accepted in the construction sector, yet various construction companies, innovative start-ups, architects, municipalities, and principals are already experimenting with circular economy principles. Examples include Park20|20 in Hoofddorp, the Overtoom urban garden project, the Knoop national office project in Utrecht, the Brummen town hall, and the office of a sensor manufacturer in Hengelo. Rijkswaterstaat will open up the first biobased motorway service area on October 26th, 2016.

Green Deals

Meanwhile, a number of Green Deals have been concluded regarding circular economy in the construction sector. Under the *Circular City Green Deal*, public and private parties are collaborating at the local level to close the materials cycle in the construction sector. The *Circular Buildings Green Deal* focuses on the development of a "buildings passport" outlining a building's circularity. The construction sector already has amassed several decades of experience in the use of biobased construction materials. The *Biobased Building Green Deal* was concluded in December 2015; as a follow-up, a ready-to-market biobased house was exhibited at the Innovation Expo of 14 April 2016. The demand side is also beginning to move now, for example, in the province of Noord-Brabant and the city of Amsterdam.[84] They are planning to focus on the use of biobased construction materials in new buildings and renovations, in keeping with the circular economy. Their current challenge involves upscaling the use of biobased construction materials.

The *Infra-Nature Green Deal* provides best practices and know-how regarding the implementation of natural solutions in the construction of S&CE infrastructure. With the *Sustainable S&CE Green Deal*, this experience is widely disseminated to the other parties (principals and contractors) in the S&CE sector.

Under the *Urban Green and Blue Values City Deal*, pilots are carried out involving the use of natural rather than technical solutions in area developments and new construction projects. This generates savings in the use of raw materials and cuts the cost of, for example, reducing heat stress or pluvial flooding.

5.4.5 Planned actions

Sector agreements

Along these lines, the Cabinet is now encouraging the establishment of a value chain agreement with the concrete sector in 2017. The parties to this agreement will include both raw materials suppliers, cement and concrete (mortar) manufacturers, contractors, and concrete recyclers, but also public and private principals. Principals on the government side include Rijkswaterstaat [the executive arm of the

[83] Together with the national environmental database, the *Assessment method for the environmental performance of buildings and S&CE projects* constitutes the basis for the environmental impact assessment of material use. In actual practice, various calculation tools are used to this end. Examples include GPR Gebouw, GreenCalc, DuBoCalc, and BREEAM.NL. These tools use the assessment method referred to above and provide reliable information on the sustainability of a building or structure.

[84] In the years ahead, the municipal authorities are planning to build 25,000 houses in an optimally circular/bio-based manner.

Ministry of Infrastructure and the Environment], ProRail, and the Central Government Real Estate Agency RVB. The agreement is aimed at a substantial reduction of the annual CO_2 emissions during the production and use of concrete, achieving circularity in the value chain, and setting down agreements on the preservation of natural capital.

In addition to this agreement on concrete, the Cabinet plans to reach similar agreements on other construction issues before 2020.

More innovative and circular construction projects

Together with principals such as corporations and municipalities, the Cabinet will explore the options for adding "substance" to innovations in residential and non-residential construction, in order to be able to launch innovative concepts such as circular and biobased construction at multiple locations and in multiple projects. This could boost the business community's willingness to invest risk-bearing capital in innovative projects. This effort will have to bear fruit by no later than 2020. The business community must submit innovative concepts for new materials and circular construction. Certification, standardisation, and equivalence could contribute to accelerating their application. The *Smart Regulation* programme will submit concrete proposals to this end.

CO_2 reduction

Furthermore, the Cabinet intends to initiate pilot projects aimed at, e.g., gaining more insight into the options for CO_2 reduction in the construction and operational phases. The aim is to achieve optimum synergy with the activities associated with the energy transition in the construction sector. To this end, the projects will map out the existing energy (savings) tools that can simply be supplemented, with attention to circular and biobased use of materials and resources.

Reuse of materials

Pilot projects can also be used to encourage the further development of a circular construction assessment method. Separate attention must be focused on the quality of reused construction materials.

The National Waste Management Plan (*Landelijk Afvalbeheerplan – LAP*) plays a key role in this respect, as it sets out the frameworks pertaining to permit application procedures for construction and demolition waste.

The pilots are intended to not only focus on technological innovation, but also on the social and system changes required in the construction value chain in order to achieve circularity.

Implementation agenda for innovation in the construction sector

The Cabinet will present an *Implementation Agenda for innovation in the construction sector* to the House of Representatives by no later than the end of 2016. In the Implementation Agenda, the government aims to:

- gain insight into the prospects for innovation in the construction sector through a market-based approach (infrastructure, real estate, and housing). Points of departure are the societal issues already identified and pilots drawn up in the context of the Round Table discussions with representatives of the construction sector and knowledge institutes;
- develop widely supported policy statements, in consultation with the sector and knowledge institutes, regarding a number of overarching issues (digitalisation, human resources, transparency, benchmarking, regulations, tender regulations, et cetera). The municipalities will be involved in this process.

Innovation

The Cabinet will explore ways to remove asbestos fibres using existing methods that will enable reuse as cleaned (construction) material.

Life cycle costs approach by Central Government Real Estate Agency RVB

Through the RVB projects, the Cabinet can convert circular ambitions into actual practice. This conversion is underpinned by the criteria for socially responsible procurement and sustainable demolition, as this is where the environmental impact of materials plays a role. In addition, the RVB uses the Life Cycle Costs approach in its projects wherever possible.

Circular S&CE construction by the government

As the largest S&CE principals, RWS and ProRail can set an important example for this sector. A distinction is made between the design, construction, and renovation phases on the one hand, and the management and maintenance phases of structures on the other. For each of these phases, tools will be developed enabling the RWS networks (the main roads network, the main waterways network, and the main water system) and the ProRail rail network to make more efficient use of resources. Along with these efforts, the networks will achieve energy neutrality by 2030.[85] For example, RWS will circularise its operations by no later than 2030, while ProRail pursues 100% circularity in its S&CE designs by 2030. The subsequent life cycles of structures are also taken into account in this respect (multi life cycle analysis). These aims are reflected in many RWS procedures, among which is circular procurement.

[85] Parliamentary Documents II, 30 196 no. 459

Reduction of material consumption by natural solutions
Large-scale paving is undesirable from a climate adaptation perspective. By utilising naturally available benefits, such as the water storage capacity of the subsoil or the cooling effect of greenery, material requirements may be reduced. Natural capital constitutes a tool that helps bring the circular economy closer. Under the *Urban Green and Blue Values City Deal*, cities are experimenting widely with the use of natural capital (for example, water storage).

5.5 Consumer goods

5.5.1 Why this priority?

Consumers (citizens and companies) play an important part in fostering the transition to a circular economy. Consumers make conscious yet also quite frequently unconscious choices when purchasing consumer products, and discard such products after a certain period of time. Consumer goods (things or stuff) rank first in the environmental impact top ten of average annual consumption per capita[86]). Many discarded products are already separated and recycled, but half of the mass still goes to waste because it is incinerated or ends up in a landfill. Residual waste from citizens and companies accounts for 80% of the total volume of incinerated or landfill waste.[87]

Consumer products and their packaging are not just used at home, but also outside the house, for example, at work, in school, or on the road. Citizens and companies are not always aware of the importance of the role they play in preserving the high quality use of products and materials. Everyday choices, whether conscious or unconscious, affect the demand for products and materials, and their discarding after use. Changing consumer behaviour is vitally important, with special attention focused on waste prevention. Such behaviour forms part of an overall approach to product value chains, which run from design and production up to and including discarding and recycling.

We are no longer in a position to waste raw materials. Too many raw materials are wasted: in 2012, nearly 10 million tons of Dutch waste were incinerated or landfilled. Municipalities, producers, and waste and recycling companies can play a greater role in the transition to a circular economy, among other ways by focusing on and investing in innovative collection, sorting, and processing systems that yield high-quality raw materials for producers. Such systems may be structured more effectively in order to facilitate the proper discarding of products among citizens and companies, thus fostering high-grade recycling and closing loops. To this end, it is imperative that products are designed in a manner that extends product life, enhances their reusability, repairability, and recyclability, and uses renewable raw materials. Consumers must exercise more care in the separate disposal of products and materials in the appropriate collection systems.

5.5.2 Vision for 2050

By 2050, we will only use sustainably produced, renewable, and generally available raw materials. We will make efficient use of raw materials and no longer produce waste or litter. The consumer goods that are eventually discarded will be recycled in a high-quality manner and used for new products. Smart return and collection systems will have been set up to this end. Citizens and companies will exercise due care in dealing with products, including how they discard them after use, thus eliminating the need for incineration or the landfilling of residual waste; while discarded products and materials will retain their value in the economy.

Companies will facilitate their employees and customers in waste prevention and waste separation, and pursue sustainable raw materials policies because these pay off. Citizens and companies will purchase sustainable products and services that can be properly reused once discarded. The retail trade sector will support consumers in their choices by offering only sustainable products. The waste and recycling sector will encourage the customers, and is crucial for the producers in ensuring their high-quality use of recyclates rather than primary raw materials; recyclable raw materials will no longer be incinerated. Consumers will regard the careful use of products and materials as a standard matter, in order to make a concrete contribution to the preservation of natural capital and the countering of climate change.

5.5.3 Operational goals

1. By 2020, the annual volume of household residual waste will be a maximum of 100 kg per capita; by 2025 the maximum will be 30 kg per capita per year;
2. By 2022, the volume of residual waste from companies, organisations, and governments that is comparable to household residual waste will be halved (compared to 2012 figures);
3. By 2025, citizens and companies will use consumer goods in such a manner as to allow them to remain in the cycle; not littering will have become the standard.

[86] Top ten of environmental impact of average consumers, CE Delft, April 2016

[87] Waste processing in the Netherlands, 2014 data, Waste Registration Working Group, November 2015

Only 2.6 kg of “ordinary” waste a week

Kees and Daniëlle have participated in the 100-100-100 project: 100 households, 100 days,100% waste-free.

‘... we used to throw out ridiculous amounts of waste.’

‘Of course, it is just a drop in the ocean,’ says Kees, ‘but we used to throw out ridiculous amounts of waste. Now we separate our waste, which leaves us with only 2.6 kg of “ordinary” waste and an average of 2 shopping bags of plastic a week. We also have a separate bin for organic waste. I was rather dreading that. It is bound to smell, I thought. But we collect our organic waste in a small bin and empty that into the large organic waste bin outside. I’m very happy we started this. Our 60 litre waste bin in the kitchen is now for sale.’

Daniëlle agrees: ‘We are definitely going to continue separating waste after the 100-100-100 project. We are not buying less than usual, but we do take a bag of our own along to the shops, for example. It has become a good habit that requires little effort. On the day before we went on holiday I threw our organic waste into the ordinary bin, and felt rather guilty.’

More bins for plastic waste: that is something Daniëlle would like to see. ‘But the government should also refute the urban legend that once separated, all waste is thrown together!’ Kees wonders about the different regulations in place from one municipality to the next. ‘In our town, milk cartons and tins go into the regular waste bin, but in other cities they can go into the plastics bin. That does not make sense. Why can’t the regulations be the same throughout the country?’

Kees en Daniëlle

100-100-100-project

5.5.4 Ongoing efforts

Applying behavioural knowledge for consumer action perspective

In keeping with the recommendations by the Dutch Scientific Council for Government Policy (WRR)[88] and the Council for the Environment and Infrastructure (Rli)[89], we have embarked on utilising current behavioural insights in actual practice. Our point of departure is the *Approach to promoting sustainable consumer behaviour*[90] developed within the From Waste to Resources (VANG) programme. The Behavioural Insight Teams[91] (BITs) set up by the Ministries of Infrastructure & the Environment and Economic Affairs map out behavioural insights (both internally and externally), and recommend effective practical policy applications.

In the *Duurzaam Doen* [Sustainable Action][92] project, the Ministry of Infrastructure and the Environment has joined forces with a network of companies, NGOs, and (young) entrepreneurs to enhance the appeal, relevance, and accessibility of sustainable choices for consumers. The *PLUK* campaign[93] marks the first step in sharing inspiring products and services, experience, and concrete tips related to sustainable living and consumption.

Best practices:
In the 100-100-100 project[95]*, households demonstrate, in concert with their municipality, that a reduction of domestic residual waste to no more than 25 kg per capita per year is feasible.*
The Schoon belonen [Rewarding clean] project is another fine example of an initiative revealing ways to develop effective return systems for certain packaging.

Domestic waste

Households still produce an annual average of some 250 kg of residual waste per capita. Effective separation and prevention measures can substantially reduce the volume of domestic residual waste. In concert with the municipalities, the *Publiek kader Huishoudelijk Afval* [Public framework for domestic waste][95] and the *Uitvoeringsprogramma Huishoudelijk Afval*[96] [Domestic waste implementation programme] have been drawn up to halve the volume of household residual waste. A further reduction in the volume of discarded paper will be achieved by a wider use and easier accessibility of No-No (no junk mail, no free newspapers) stickers, simplifying unsubscription to quasi addressed printed matter, and a shift to and acceptance of digital advertising matter. Implementing partners in these initiatives include municipalities and organisations active in the advertising sector.[97]

Value chain approach

Under the Domestic Waste implementation programme, stakeholders are working on the material and financial closure of product value chain loops, and the optimisation of material and product flows. This value chain approach targets consumer goods from domestic and similar waste, such as nappies (diapers), textiles, mattresses, and plastics. Plastic recyclers are involved in the latter topic, in accordance with the Van Gerven motion.[98] On the basis of a collective vision, the stakeholders are working on, e.g., prevention, improvement of waste separation, more and better recycling, and processing technologies. With respect to each value chain, options are explored for introducing individual refunds for the relevant materials.

Implementation of ICSR covenant on sustainable clothing and textiles

Several product value chains are tackled under an international CSR covenant. Textiles constitutes the first of these product value chains. The conclusion of the International CSR *Covenant on Clothing and Textiles*[99] provides a solid foundation. Under the ICSR covenant, concluded in 2016, stakeholders are developing a circular economy roadmap for the fashion and textile sectors. This roadmap addresses raw materials efficiency, production planning, use of recycled materials, reuse, and wastage. It is up to the companies involved to establish sustainability and circular textile strategies, and select conducive initiatives. The Social

[88] WRR, *De Menselijke Beslisser* [The human decision-maker], 2009

[89] Rli, *Doen en Laten* [Taking action or not], 2014

[90] National government, *Aanpak Verduurzamen Consumentengedrag* [Approach to promoting sustainable consumer behaviour], 2015

[91] BIT is a network of knowledge institutes, renowned behavioural scientists, and practical experts in the behavioural field.

[92] https://www.duurzaamdoen.nl

[93] https://www.pluk.nl

[94] 100 households in each municipality attempting to live 100% waste-free for 100 days.

[95] Public framework for domestic waste, Ministry of Infrastructure and the Environment, November 2014

[96] Domestic Waste implementation programme, Ministry of Infrastructure and the Environment, November 2014

[97] This carries into effect the Ouwehand motion (Parliamentary Documents II, 30 872, no. 194), requesting the government to enter into consultations with municipalities in order to better facilitate the use of No/No stickers, and the Ouwehand motion (Parliamentary Documents II, 30 872, no. 195), requesting the government to explore ways to combat the surreptitious use of quasi addressing in junk mail.

[98] Parliamentary Documents II, 30 872, nr. 153

[99] International CSR Covenant on Sustainable Clothing and Textiles, March 2016

and Economic Council of the Netherlands (SER) has supervised the establishment of the covenant and will designate a secretariat to monitor its implementation. This also extends to the pending (ICSR) covenants to be concluded with the other high-risk sectors.[100]

Non-domestic waste (office, shop, and services sector)

The *VANG Buitenshuis* [From Waste to Resources – Non-domestic] programme is aimed at halving the volume of residual waste in the Office, Shop, and Services (OSS) sector. By 2022, the volume of residual waste from companies, organisations, and governments comparable to domestic waste must be halved from 2 Mton to 1 Mton. To achieve this goal, Green Deals have been concluded with NS/ProRail and with festival organisers, and pilot projects have been rolled out aimed at waste prevention and separation in schools and along motorways. The Rijkswaterstaat Directive for transparent waste separation[101] published in 2015 (seeking uniformity in colour, pictogram, and designation) provides tools for efficient communication regarding waste separation and encouraging positive behaviour. A study is currently underway into residual waste, opportunities, and obstacles in the OSS sector. The approach will be intensified on the basis of this study. The national government falls under the OSS sector and is assuming responsibility for halving its volume of residual waste.

National Litter Policy

Litter is still a widespread phenomenon. Keeping public spaces clean entails an annual societal cost of some 250 million euros. The packaging industry contributes an annual 20 million euros to this sum.

Together with the network partners, the Cabinet seeks to clean up and prevent future litter. The implementation of the *Landelijke Aanpak Zwerfvuil* (National Litter Policy, LAZ)[102] will be continued in 2017, placing even greater emphasis on participation by citizens and companies, enforcement of the regulations, influencing citizen behaviour, and tackling sources. An integrated approach is being adopted to promote sustainable behaviour to keep the Netherlands clean.

Framework agreement on Packaging

Under its responsibility as producer, the packaging industry has committed to the *Framework Agreement on Packaging II* (2013-2022). In collaboration with the municipalities and the central government, they will carry the agreements set out in this agreement into effect. The Framework Agreement parties are contributing to the transition to a circular economy and the reduction of residual waste by investing towards a sustainable packaging value chain, improving the collection and recycling of packaging waste, developing innovative return and processing systems, and initiating clean-up activities. A good example is the *Schoon Belonen* [Rewarding Clean] project.[103] Sustainable packaging is developed through *Sector sustainability plans*, setting out goals for achieving more sustainable product-packaging combinations. In addition, various sectors have committed to using a certain percentage of recycled materials in their packaging.[104]

More and better recycling

We want to prevent recyclable material from ending up in the incinerator. With a view to, inter alia, achieving the goal of halving the volume of incinerated or landfilled residual waste, the central government and the branch organisations in the waste and recycling sector[105] have set down agreements in the *More and Better Recycling Covenant*. To achieve this goal, the parties are jointly working on the promotion of sustainable innovations in waste management and recycling, focused on quality and reducing the environmental burden, in particular in the field of waste separation and collection, on increasing the cost-effectiveness of sorting processes, and on high-grade recycling.

The Cabinet will explore cost-effective ways to upcycle valuable streams from foreign household and commercial waste that is currently incinerated in the Netherlands.

Prevention and removal of litter in water

With respect to the prevention and removal of litter in the oceans, the Programme of Measures for implementation of the Marine Strategy Framework Directive (KRM) will be continued in 2017. Continued support will be provided to the associated Green Deals, such as those pertaining to Clean Beaches, Fishery for a Clean Ocean, and the Shipping Waste Value Chain. Clean-up campaigns such as those initiated by Stichting De Noordzee and Schone Maas fit in with this integrated approach. As an extension of these efforts, the Netherlands is taking and will continue to take a proactive stance in the implementation of the OSPAR *Regional Action Plan*, involving joint regional measures for combating marine litter in the North Sea region.

[100] CSR sector risk analysis, KPMG, September 2014

[101] http://www.rwsleefomgeving.nl/onderwerpen/afval/afvalpreventie/vang-buitenshuis/downloads-vang/richtlijn-herkenbare/

[102] Plan of Action for the National Litter Policy, Ministry of Infrastructure and the Environment, December 2015

[103] *Schoon Belonen* pilot, June 2015

[104] Plastic Recycling Fact Check, KIDV, March 2016

[105] VA, BRBS Recycling, FHG, NVRD

5.5.5 Planned actions

Wider deployment and expansion of behavioural knowledge

Citizens and companies bear an important responsibility for the responsible use of products and materials, and their high-grade return to the economy. Individual consumer behaviour is influenced by personal circumstances, a person's considerations, and his/her beliefs. The social environment also plays a part. Effective influencing of these factors calls for sharp analyses, careful monitoring, and evaluation of interventions. The Cabinet will deploy the BIT teams on a wider scale and launch a study to gain more grip on influencing norms and values (unconscious behaviour).

It is important for consumers to realise that waste has value and can be reused, if properly used and discarded. The message of efficient and effective use of raw materials must be disseminated and embraced on a much wider scale. Actual observance of the *Waste is a resource* standard is essential. Sustainable choices must become more appealing, more relevant, and easier. The PLUK campaign will be expanded with presentations at locations at which consumers make sustainable choices.

Promoting sharing, reuse, and repair among residents

Together with manufacturers and municipalities, the Cabinet aims to encourage reuse by updating second-hand and give-away shops, and reinforcing the repair and restoration culture through, for example, repair cafés. For that reason, a pilot was launched in 2016 involving coalitions with municipalities, waste collectors, and recycling and repair companies aimed at encouraging and upscaling the reuse of goods. Together with municipalities, the Cabinet will make an effort to promote utilisation of sharing platforms among the population, and encourage residents to lease, rent, trade, and give away more. A set of concrete everyday waste prevention tools is currently being developed and will be communicated to consumers. In keeping with the Van Tongeren and Çegerek motion[106], the Cabinet will also examine which products are most frequently offered for repair. The House of Representatives will be informed accordingly in the annual progress report on this programme

Optimising consumer goods product value chains

Nappies (diapers), textiles, mattresses, furniture, plastics, and other waste similar to domestic waste are also produced by parties other than households. A large proportion of such waste is still incinerated. For that reason, the *VANG Domestic Waste* value chain approach will be expanded to include similar commercial waste. The intention is to have relevant consumer goods value chains closed, in terms of materials and funding, by 2025. In addition to material and financial aspects, the value chain loop closure process will also pay attention to ecological and social (multiple) values.

In order to be able to effectuate the transition to a circular economy, the "utilisation" phase needs to be spotlighted within the five priority sectors and value chains. From this perspective, this phase needs further elaboration, together with the relevant value chain partners. An example is the use of power drills that are made for frequent use, while in actual practice consumers only use the product for 12 minutes of its entire life cycle. This calls for change.

More effective collection and return systems

The prevention and proper separation of waste needs to become transparent, easy (univocal), and appealing for citizens and companies. For that reason, the Cabinet is going to devise a method, together with producers, municipalities, and the waste and recycling sector, for the introduction of a univocal and efficient collection system for both domestic and commercial waste (similar waste, consumer goods). This must enable consumers to dispose of their waste separately "anytime and anywhere" (at home, at work, in school, or on the road), thus ensuring that more waste is recycled in a more efficient manner.

In order to develop a univocal and efficient system, the Cabinet is calling on the major cities to catch up with the majority of the other municipalities with respect to separate waste collection. Inspiring experiences with alternative waste collection systems, such as reverse collection[107], tariff differentiation[108], and "100-100-100" are taken into account in this effort. The ultimate goal of the Cabinet is that the best results will be the standard ("if it can be done elsewhere, it can be done here too"). Another system that could prove effective in this regard is subsequent separation.

This calls for companies to support their employees and customers in the field of waste prevention and separation (e.g., setting purchasing requirements, circular procurement, providing waste separation bins, offering non-packaged products, et cetera).

Improved sorting and processing systems

In their capacities as principals and contractors, local parties may raise the requirements to be met by parties further down the processing value chain, in order to reduce residual waste. The Cabinet will encourage municipalities

[106] Parliamentary Documents II, 33 043, no. 59

[107] Reverse collection: collection system in which reusable materials are collected door-to-door, and residual waste must be taken to a central location.

[108] Waste produced by households is registered upon collection; waste levies are proportional to the volume of waste offered for collection.

and waste collectors to make increasing use of *innovative tenders* (waste contracts) to improve the efficiency of sorting and processing systems.

Efforts to reduce the volume of residual waste can bear fruit: in 2015, several municipal waste companies, such as Circulus-Berkel BV and Midwaste, adopted an innovative tender procedure to successfully challenge sorting companies to raise the percentage of plastics sorted (from 50% to more than 90%).

High-grade use of recyclates

The waste and recycling sector can be regarded as a "resource broker", a broker that ensures that raw materials are collected and sorted as cleanly as possible, and that ensures that producers are supplied with sufficient high-quality recyclates.[109] The Cabinet intends to set down and make agreements on the proportion and quality of recyclate for the relevant product value chains, together with the waste and recycling sector and the producers. Recyclate must be able to compete with primary material on the (European) market (consistent quantity, quality, and price). This actually does not only apply to consumer goods, but also to the other priorities identified in this programme.

Disposable products

The Cabinet will enter into consultations with producers and retailers to cut back the use of non-sustainable, disposable products (such as promotional products or disposable plates). After all, there is a sufficient array of alternatives made of renewable raw materials. Wherever necessary, the tools outlined in this Government-wide programme can be used to this end.

Waste Fund

The Board of the *Stichting Afvalfonds* [Waste Fund Foundation] has reported on the activities it has undertaken up till now. The Stichting Afvalfonds will use the remaining resources to help fund projects aimed at the promotion of the separate collection and recycling of packaging, making the packaging value chain sustainable, and combating litter. The Cabinet applauds this, because in its view, these efforts make a substantial contribution to achieving the goals set for the plastics and consumer goods priorities. Supplementary agreements will be made by municipalities, the packaging industry, and the Ministry of Infrastructure and the Environment. Programmes will be rolled out, including to further increase glass waste collection, and, as stated earlier, to achieve and provide clear information on an effective and univocal waste collection system, in concert with the municipalities. Several municipalities have already demonstrated that tremendous results can be achieved. This boost is expected to accelerate and improve the results achieved by the other and especially the large municipalities. The Stichting Afvalfonds funding thus contributes to the realisation of the ambitions set out in this programme.

[109] Recyclate is the generic term for all sorts of products generated by a completed recycling process, that can be used without any further processing in a semi-manufacture or end product production process.

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