CIRCULAR ECONOMY

FROM WISH TO PRACTICE

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Council for the Environment and Infrastructure

About the Council for the Environment and Infrastructure

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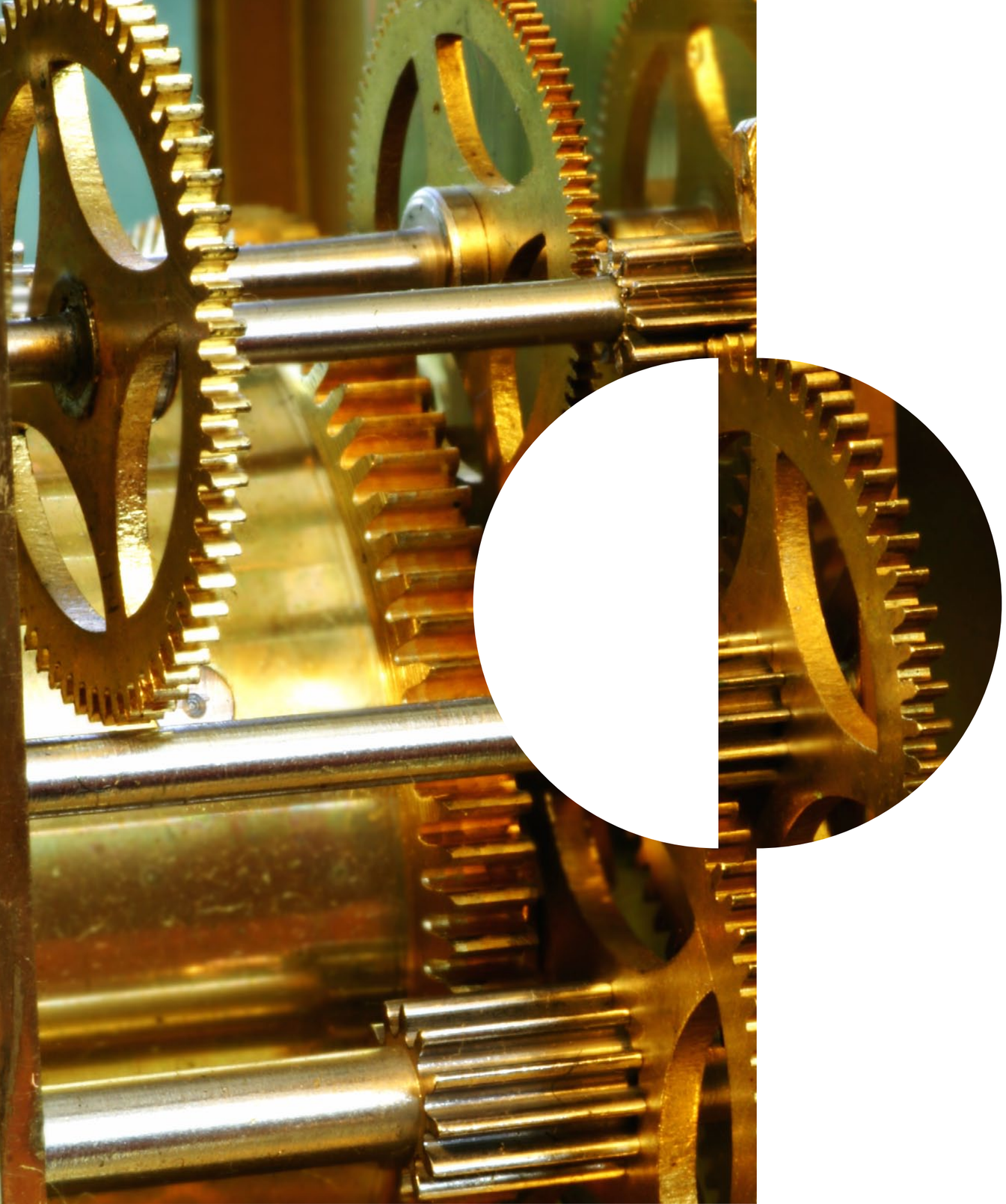


SYSTEMATIC APPROACH TO A CIRCULAR ECONOMY

1.1 Necessity and opportunities for a transition towards a circular economy

The scarcity and optimum utilisation of resources constitute major challenges in this 21st century. Not just for environmental reasons, but definitely also for economic and political-strategic considerations. Transitioning to a circular economy will enable the Netherlands to face these challenges. In a circular economy, resources are retained in the chain for a longer period of time and at a qualitatively higher level (the aim being indefinite reuse), rather than being discarded after (single) use - as is the case in the current linear system. As a result, economic value is retained and created and negative environmental effects are reduced. The reuse of products and raw material flows is an important improvement, but a circular economy encompasses more: the reuse and conservation of materials is already a starting point in the design phase of products and services (eco-design) (see Part 2, section 1.2 for the exact definition of circular economy as used in this advice).

According to the Council, the Netherlands needs to develop such a circular economy for three reasons. First of all, the economy in the Netherlands is highly dependent on the import of raw materials. On average, the country sources 68% of its raw materials from abroad (CBS, 2012, see Part 2, section 1.1). For 54 scarce and economically important[1] raw materials, Europe in its entirety even depends for 90% on raw materials imported from outside Europe (European Commission, 2014). Along with shifting power balances and conflicts in resource-supplying regions, this dependence leads to fluctuations in resource prices and the security of supply. Secondly, this affects the earning capacity of the Netherlands. Thirdly, the shift towards a circular economy is also made necessary by the growing global demand for resources and the ensuing increased environmental impact. This environmental impact is currently already exceeding the sustainability limits of the earth.[2] The need to seek out alternative ways of dealing with resources which strengthen the economy is therefore substantial.

The transition to a circular economy presents the Dutch economy with several opportunities: a greater independence from imported raw materials, new economic revenue models and a lower environmental burden. In itself, the notion that a transition to a circular economy brings with it these opportunities is not a new one; in recent years, various parties have already argued this in several leading publications (McKinsey, 2013; Bastein et al., 2013; Ellen MacArthur Foundation, 2013). Of particular importance to the Council is that the opportunities generate different effects at different scale levels and therefore require a different elaboration, rewards, incentives and supporting policies. After all, raw material flows and product and service categories often have their own dynamics and own scale size. Due to their weight and the associated transport costs, building materials commonly need to be reused locally. Electronics and cars on the

1 Also called critical materials.
2 In 2009, Rockström et al. described nine planetary boundaries which humanity must not exceed in order to be able to make sustainable use of the Earth's resources (Rockström et al., 2009). Currently, four of these boundaries are already being exceeded (Steffen et al., 2015).

other hand are assembled using components from all over the world. When parties such as manufacturers, consumers, government bodies or scientists start focusing on a circular economy, they therefore rarely simultaneously meet at the same consultation table, although this impression is sometimes given in discussions on the circular economy. According to the Council, the realisation of aspects of a circular economy is always scale-dependent. The Council therefore requests that 'scale-specific' attention be paid in policy processes.

To advance the many opportunities for a circular economy, the Council feels that a systematic approach at the various scale levels (European, national, regional and/or local) is necessary and deserves further development. It is for this reason that this advice has been formulated.

1.2 Advice question: how can scale levels be optimally utilised?

Although initiatives related to the circular economy have been launched in many places in recent years, only limited attention has been paid to the importance of scale. The Council finds that opportunities are being missed as a result.

At the same scale level

Firstly, opportunities may be missed at the same scale level. This is because it is still possible to more consistently gear efforts to one another within the same scale level. That allows parties to choose strategies that reinforce each other. One example to illustrate this is the construction of heating networks in regions of the Netherlands (Tweede Kamer, 2015b). Here, homes are heated using industrial residual heat, heat from deeper layers of the earth or the residual heat from waste incineration by power plants in the region (see Box 1).

Box 1. Choices at the same scale level are interrelated

In a circular economy, the incineration of waste is the last option after dumping. Heat and electricity are generated through burning. The demand for the capacity of waste incineration plants is expected to decrease in a circular economy. Current policy decisions may be contradictory to this. An example at the local level is the mega-investment in the construction of the Noorderwarmte heat transport network to provide Amsterdam Noord with heat. This heat is generated through the incineration of waste at an incineration plant. As a temporary solution, that is a logical strategy. Especially since these heating networks, which are based on the residual heat from waste incinerators, may serve as a driver for the emergence of open networks (smart grids for heat) to which other energy sources (such as geothermic energy, biomass, power to heat) can also be connected. In the long term, such heat sources will however still need to be revised. After all, the

circular starting point is to incinerate as little resources as possible and to optimally reuse them.

Bearing in mind the starting points of circularity, it is important to include the reduction of the incineration capacity of Afval Energie Bedrijf (AEB) in the decision to participate in such an investment. That means that it must be clear from the start how the phasing-out of this heating capacity can be off-set by residual heat from other companies or sources (geothermal energy). If this clarity is lacking, then the investments in the heat transport network can turn into a lock-in for the capacity reduction of AEB and, with that, as a lock-in for the realisation of a circular economy.

Between scale levels

Opportunities may also be missed between the different scale levels. An example which demonstrates the importance of proper coordination between scale levels is the decision to introduce the recycling of plastic throughout the country in 2008. To prevent sub-optimisation, this decision requires good collection systems at the local level and a coordinated approach within regions on the establishment of recycling plants. Another example is the decision to promote biodegradable plastic nation-wide. For this to work, local parties must be able to sort and recycle the plastic.

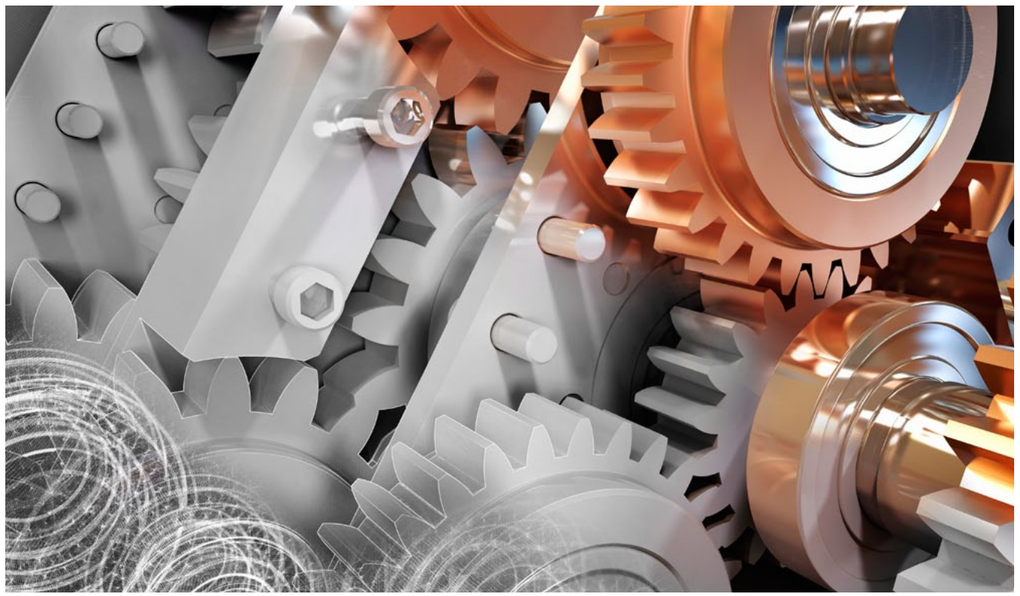
The examples make clear that decisions at one scale level influence other scale levels or, in the longer term, can impact the transition to a circular economy. They illustrate the necessity of good coordination between parties, both within and between different scale levels, to thus prevent any opportunities from being missed.

In view of the above-mentioned, the Council puts the following question central in this advice:

How can the (national) government contribute to ensuring that optimum use is made of the opportunities presented by a transition to a circular economy at the various scale levels (European, national, regional and/or local)?

In this advice, the Council primarily focuses on the national level and addresses the roles of the various ministries in that respect. Furthermore, the Council describes the possibilities the State has to exercise influence at the European level via the Dutch presidency of the EU in 2016. Although the recommendations in this report are mainly directed at the State, the Council realises that a transition to a circular economy requires the involvement of many parties: companies, citizens, knowledge institutions, civil society organisations and regional and local government bodies. The State cannot achieve a circular economy by itself. Bearing in mind the realisation that a joint effort on the part of all parties involved is essential, the Council will also discuss a proposal for a systematic approach

for regions, provinces and municipalities. Recommendations to the business community and to specific chains have not been included in this advice; the Council feels that a uniform division of tasks is not possible. After all, each chain requires a customised approach and has characteristics that are specific to that chain and to the local area. To promote sustainable behaviour among the population, the Council refers to the RIi advice 'Influencing behaviour: more effective environmental policy through insight into human behaviour' (RIi, 2014a).



1.3 Outlines of the Council advice: inherent strengths *and* cohesion

In this advice, the Council argues that the moment has come for the Netherlands to embark on the next phase in the field of waste and recycling: from waste management to resource management whilst simultaneously preserving and creating value. In recent decades, the Netherlands has built up a strong position in Europe and internationally for the treatment of waste flows. Now, the need *and* opportunity have arisen to expand this position into a leading position in the field of retaining and creating value of and through resources. The Netherlands can market the innovations (technological, organisational and economic) that ensue from this both nationally and internationally. The 'circular economy' is the banner under which this change is proposed to take place, an economy that makes growth possible by keeping raw materials in the economy for a longer period and at a qualitatively higher level.

The impetuses for this transition towards a circular economy are already present. The government has earmarked the circular economy as one of the goals in the coalition agreement by stimulating a (European) market for renewable resources and the reuse of scarce materials (Regeerakkoord, 2012). Several policy programmes of the Ministries of Infrastructure and the Environment (I&M), Economic Affairs (EZ) and the Interior and Kingdom Relations (BZK) among other things focus on resource efficiency, the circular design of products (eco-design) and facilitating the use of services rather than the ownership of products. Regions, cities and community groups in the Netherlands are developing plans to achieve circularity in towns or neighbourhoods. Provinces are exploring the themes in their strategic policy-making (e.g. the provinces of Friesland, Utrecht,

Noord-Holland, Zeeland, Noord-Brabant). Companies are adapting (parts of) their activities to the circular starting points (e.g. DSM, carpet manufacturer Interface and Desso and Van Houtum paper).

In the view of the Council, the challenge for the Netherlands is to build on these impetuses and create more coherence, prompting the circular economy to develop from an experiment to common practice. To achieve this, a systematic approach is required at every scale level (European, national, regional and/or local). Such an approach allows for the realisation of proper coordination between similar and different scale levels; something which is necessary according to the Council. After all, is there actually so much demand for circular hubs or hotspots, which Amsterdam, Rotterdam and Paris for example want to become? Are parties not pursuing the same goals too much? In which areas do European countries need to cooperate and which areas actually require profiling? And regarding the latter, what makes the Netherlands and regions of the country strong in a circular economy? How does the Netherlands distinguish itself from Flanders or Luxemburg? What makes the province of Overijssel unique compared to the province of Zeeland? Until now, insufficient attention has been paid to the scale-specific approach towards a circular economy. Of course, this does not necessarily mean that initiatives are counteracting one another, but perhaps they are also not strengthening one another. Countries and regions must concentrate more on the inherent qualities they possess in relation to the inherent qualities of others and distinguish themselves on that basis. By inherent qualities or strengths, the Council refers to the specific strong points, characteristics and starting points of a region, province or country.

According to the Council, the use of inherent strengths as a starting point must become the core of a circular agenda of government bodies in the coming years. To this end, the Council offers a number of recommendations: to the State, to provinces, regions and municipalities. The Council also calls for the further development of a circular economy on a European scale through the Dutch presidency of the EU. In conclusion, the Council will organise a stakeholder meeting to explore potential follow-up actions and forms of coordination between the various governmental layers.

The core of the recommendations in this advice is to spur the State to establish a joint circular agenda and to link this with strategic goals and concrete actions for the various ministries. In this way, a ‘shared dot on the horizon’ is linked with concrete implementation measures. In close consultation - but using the inherent strengths of each party as a starting point - the various ministries should take specific measures which are in line with their task descriptions. The advice offers proposals to this end, among other things for an enterprise policy that focuses on a circular economy, promising Dutch sectors and promising (new) chains. For a deliberate infrastructural and logistical government policy that supports changing transport flows in the Netherlands. For ensuring that the circular economy is given a prominent position on the National Science Agenda. The use of inherent strengths as a starting point must also play a central

role in the policies of regional and local governments. Some of the actions ensuing from that policy are standard measures that each local government body should take: for example, the separation and recycling of waste flows needs to be properly organised in each municipality. Other actions consist of building on and fortifying the inherent strengths in the region (such as economic activity, specific flows). This is how regions distinguish themselves from one other, each with a specific mix of regeneration, sharing economy[3], the aim to realise a zero waste region and industrial symbiosis[4]. Regions must develop a strategy for this. In conclusion, it is important that government bodies set the right example at all scale levels, for example through a purchasing and procurement policy based on circular starting points.

This outline of the advice is further fleshed out in the next chapters.

1.4 Structure of the advice

In chapter 2 of Part 1, current initiatives are briefly addressed and the Council offers its view on the question why a circular economy has not yet become commonplace. Chapter 3 contains the recommendations of the Council. What are the requirements to move closer to the transition towards a circular economy? What does a transition agenda look like? Chapter 4 deals with the other players in the chain and offers recommendations to regions, provinces and municipalities. In chapter 5, advice is offered aimed at the European level. In conclusion, chapter 6 offers advice to help organise the transition. In Part 2 of the advice, the issue of the circular economy is further addressed and the backgrounds to segments of Part 1 are explored.

3 Economy which focuses as much as possible on the sharing or reusing of products and services.
4 Residues and by-products from one company are used as raw materials for another company (also see Glossary).

2

THE ELIMINATION OF BARRIERS REMAINS NECESSARY

Over time, the Netherlands has built up a good position en route to a circular economy (see Box 2). For example, the Netherlands leads the way in Europe in terms of separate waste collection, achieves good results with recycling and various initiatives surrounding circular chains are underway in the country. Recent research shows that 25% of Dutch companies are familiar with and acknowledge the importance of a circular economy. Particularly companies in the chemicals sector, wholesale trade, industry and agriculture, forestry and fisheries are the most active and ambitious in this respect (MVO Nederland, 2015).

Box 2. Examples of circular economy in the Netherlands

The Netherlands has great social dynamics in terms of the circular economy, among companies, citizens, civil society organisations and government bodies. Circularity is a relatively new subject for some parties while others have been involved in this for much longer.

Desso, a Dutch carpet manufacturer, has for example already been working on the transition towards a circular company since 2008. Desso takes back used carpets from customers and competitors. The yarns are recycled into new carpets; the bitumen backing is recycled as a raw material for road construction and roofing. By 2020, Desso wants to be able to take back all of its products, after which the materials will be used to produce new, high-quality products (Desso, 2015). Another company, Van Houtum (which for example manufactures toilet paper and paper towels), among other things processes residual waste paper flows from third parties into new products. In turn, the company's own residual flows are used as resources by other plants. This method of manufacturing has resulted in considerable cost savings (1 million euros in 2013 compared to 2009), among other things through the recycling of paper residues, a more efficient use of the paper machine, a lower consumption of chemicals, energy and water and a reduced loss of resources (Van Houtum, 2015).

Numerous examples of shifts towards a circular economy are also present among (groups of) private individuals. For example, there are growing numbers of local loan and repair companies and the reuse of products through thrift stores is also increasing. New forms of service rendering, such as clothes libraries, repair cafés and initiatives for joint energy supply, are emerging as well. But the rapid growth of SnappCar, the consumer trade platform Markplaats and other forms of sharing and lifespan extension rather than traditional ownership also serve as indicators for the behavioural shift that is necessary for the transition to a circular economy.

Important progress has also been made by the government. Several provinces have incorporated the circular economy as a goal in their new coalition agreement and various regions are fleshing out the circular economy in regional policy. Significant results have already been achieved at the State level. National end-of-waste criteria have been drawn up for the recycling of aggregates from construction and

demolition waste, making them more attractive to use. For companies, it has become easier to use production residues as resources without the label ‘waste’ being attached to them. An explicit guideline has been drawn up for the substance crude glycerine, a residue from the production of biodiesel, which clearly states when it can be considered a by-product rather than a waste product. A breakthrough has also been reached for the increasingly scarce raw material phosphate: the use of recovered phosphates as fertilizer is allowed. To stimulate consumer behaviour befitting a circular economy and to promote waste separation not only at home but also in public, the State has entered into a Green Deal with the Dutch rail operators NS and ProRail regarding waste separation by rail passengers. Pilot projects have been initiated involving textile and food to experiment with influencing instruments and based on this a plan of approach has been drawn up to make consumer behaviour more sustainable (Tweede Kamer, 2015c; Tweede Kamer, 2013c).

Steps are also being taken at the European level. For example, the Ministry of Infrastructure and the Environment and the European Commission are discussing options to strike a better balance between the stimulation of reuse and the phasing-out of harmful substances. In the circular economy, companies will increasingly start to make use of recycled materials. These materials can sometimes contain substances for which restrictions are now in place which were not yet applicable back when the products or materials in question were manufactured. Assessing on a case-by-case basis whether recycling and reuse are safe in terms of health and the environment or whether destruction is better is essential in this respect (source: Hans Meijer and Loek Knijff).

Clearly, there is plenty of momentum in society. Parties however still frequently encounter barriers. In the eyes of the Council, this can be traced back to the fact that the structures and systems which are currently in place are still mostly based on the principles of a linear economy. Initiatives aimed at segments of a circular economy consequently encounter all sorts of barriers which prevent them from coming to fruition (see Part 2, chapter 3, for an overview of barriers to a circular economy). For example, smaller companies are far less successful in achieving circular initiatives than large companies because they have insufficient influence in the chain. The required transparency in the chain that would help smaller companies to revise that chain is currently lacking. Companies are insufficiently able to connect with one another and limitations are imposed on the exchange of information, agreements and cooperation, for example due to competition policy.

In order for a circular economy to materialise, tackling individual barriers alone will not suffice. Shifting from a linear to a circular economy requires an integrated approach that focuses on the long term; a system change. In literature, this is also called ‘transition’. A transition is a structural change process that occurs over a prolonged period (one or two generations) of

time, a complex process which holds various uncertainties. The primary uncertainty in this respect is the unpredictable progression of the transition, among other things under the influence of external factors. To set the change process in motion, many players and sectors are needed (Loorbach, 2007; Van der Hoeven, 2010).

Clearly, a lot has already been analysed, described and undertaken by the different players and efforts are still ongoing in that respect. But more energy will need to be directed towards the opportunities that capitalise on inherent strengths and on the creation of sufficient coherence between and at the various scale levels.

3

TRANSITION AGENDA FOR THE STATE: INHERENT STRENGTHS AND COHESION

To achieve a transition towards a circular economy, the Council has formulated a number of recommendations. Although many of the recommendations below are directed at the State, this does not mean that the Council advocates a top-down approach to the development of a circular economy. On the contrary: the Council repeatedly calls for parties to cooperate. Such cooperation should not just be top-down, but also bottom-up and horizontal. The more parties at the state level know what is happening at the regional level and the more they closely examine what is going on in the region, the more they can be inspired and influenced by this. To the Council, this open attitude and mutual interaction have been starting points for formulating the recommendations. In order to achieve this interaction, consultation and coordination are required (see chapter 6).

The recommendations are further discussed below. Recommendations 1, 2 and 3 will be mainly fleshed out with the ministries in mind, but they can also be applied to the other scale levels using a similar approach. This is discussed in more detail in recommendations 6 and 7, which are aimed at the provinces, regions and municipalities.

3.1 Draw up a transition agenda

Recommendation 1 to the State:
Make the transition to a circular economy one of the essential pillars of government policy and develop a joint, government-wide agenda 'circular economy' to this end

The multitude of recommendations, actions and parties can sometimes make it easy to lose track of the end goal; which actions should be implemented first; which actions should be developed in cooperation and which actions individually? In the opinion of the Council, it is important to add coherence to the entire process and have the State first assess what it hopes to achieve through a circular economy. What does that dot on the horizon mean to the State? Next, the ways in which this vision can be achieved must be explored. It is important that all elements be considered in coherence with one another. A (transition) agenda can help to prioritise and make clear apparent omissions and cross-connections. In the opinion of the Council, the agenda should follow these steps:

1. a vision or dot on the horizon that indicates what the end goal is (see section 3.2);
2. the development of that vision into concrete objectives (see section 3.3);
3. a coherent division of those goals, using the inherent strengths of the ministries (see section 3.4);
4. a strategy for dealing with the parties that lose out due to the transition (see section 3.5).

3.2 Step 1 of agenda: joint vision

Recommendation 2 to the State:
Develop a joint vision and incorporate this in the annual national Budget Memorandum

For an integrated transition policy, it is important to first formulate a vision: after all, the end goal must first be clear in order to know which actions are required. At present, such a widely supported vision of a circular economy is lacking (see Rood & Hanemaaijer, 2014; OPAi & MVO Nederland, 2014; Bastein et al., 2013). In view of the opportunities that a circular economy presents to the Netherlands, the Council advises the government to formulate a clear vision and to commit to this.

To date, the vision however has hardly taken shape yet and even if this does happen it still mostly occurs in the context of the individual policy programmes of the various ministries. For example, the Ministry of Infrastructure and the Environment together with the Royal Dutch Waste Management Association (NVRD) and the Association of Netherlands Municipalities (VNG) have described a vision for household waste in 2025 (see Box 3). A next step is required, a step that goes beyond the individual policy programmes and, although valuable in their own right, beyond sector-based visions. Such a vision is a first step, but it should be further extended to the entire circular economy (not just for household waste) and also include the economic and social aspects (cost reductions, enhanced security of supply, innovation, new activities, new export opportunities for the industry and employment). In Part 2, chapter 2 of this advice, the Council itself has also informally drawn up such a future vision as a thought exercise. In the development of a vision, the involvement of other parties such as ministries, civil society organisations and umbrella organisations is important. Through broad public support, the vision becomes more than just a theoretical exercise. Shaping the vision together with all parties involved furthermore reduces the likelihood that the ensuing strategies will conflict with one another, although proper coordination and feedback remain essential during the implementation phase as well.

Ultimately, developing a vision together can yield a joint focal point.[5] An analogy can be made with some Dutch companies that have incorporated a circular economy at the heart of their business strategy (e.g. Philips and smaller companies such as Dutch aWEARness, Orgaworld). Such a business strategy gives direction to a company and with that to the tasks of the different divisions. The annual national Budget Memorandum indicates what the main plans and decisions of the government will be for the year ahead; it is more or less the corporate strategy of the government. The Council therefore advises that the vision on the circular economy be included in the annual national Budget Memorandum.

Box 3. Vision for 2025

The VNG, NVRD and the Ministry of Infrastructure and the Environment have drawn up a vision for a circular economy for 2025:

- Loops automatically become closed because this is cost-effective.
- Unwanted external effects such as preventable damage during the extraction of natural resources, loss of raw materials during production and emissions during production and use are prevented as a result of the way in which the raw material chains have been structured.
- By closing the raw material and material loops which lead to domestic waste, the average Dutch person generates increasingly less waste, to a maximum of 100 kilos a year (bulky and domestic waste, 75 percent of which is collected separately) in 2020, with a further reduction to thirty kilos at the most in 2025.
- Material is retained in the chain as long as possible, making the burdens on society acceptable.
- Consumers are aware of the choices they (can) make when buying products. To this end, chains are transparent and good information is available, which helps in making choices that are responsible in terms of people and society, and thus in preventing waste as much as possible.
- Municipalities facilitate and stimulate citizens in waste separation.
- In 2025, we live in a world in which, from a waste perspective, no products are launched onto the Dutch market that harm health.
- Virtually no products which are difficult to reuse are introduced into the chain. This is due to the promotion of eco-innovation, eco-engineering and eco-design, in which the circular design of products is the starting point. European demand for these products globally leads to the sustainable design and production of sustainable materials and products. Authorities set an example and stimulate the market through sustainable procurement and sourcing.
- Objectives are formulated in such a manner that they can be implemented by and are affordable to citizens.
- The Netherlands is a leader in technology, organisation and knowledge related to recycling, the logistics of waste management

5 Currently, HRH Prince Carlos de Bourbon de Parme is working on a process via the Social and Economic Council (SER) to formulate a vision on a circular economy from his position as director of the Institute for Sustainable Innovation and Development. Collaboration is taking place with various social stakeholders. The end result may serve as input for the common vision. This input is expected in early 2016, when the Netherlands will hold the EU presidency and aims to put the circular economy on the agenda.

and recycling and the marketing of recyclates (Ministerie van IenM, VNG & NVRD, 2014).

3.3 Step 2 of agenda: joint objectives

Recommendation 3 to the State:
Formulate overarching objectives based on the joint vision

In the operationalisation of a common vision, it is necessary to collectively identify a number of overarching objectives based on the areas in which the Netherlands wants to and can be strong. These objectives can be used as a framework for decision-making. The overarching objectives offer insight into the elements that need to be realised and form the starting points to which all parties can contribute, each from their inherent strengths and qualities.

The Council notes that objectives are indeed mentioned in the policy documents of the various ministries (see Appendix A). However, these are not always linked with each other. For example, in the policy document 'Green Growth', circular economy is only mentioned under the theme 'waste' and not under any of the other policy themes (Tweede Kamer, 2013a). Furthermore, the policy objectives in the various policy programmes have not always been drawn up with the same starting point – circular economy – in mind. For instance, a recycling target of 75% does not necessarily mean that materials will also be reused again in a high-grade fashion. Therefore, it is important that objectives be linked with one another. Furthermore, targets have not yet been set for some circular themes. As Rood and Hanemaaijer (2014) conclude, concrete targets for waste and recycling are for example in place which build on the existing waste policy, but no concrete goals have been formulated for sustainable production and consumption or for the economic opportunities presented by the reuse of materials.

The Council would like to propose some overarching objectives (see Box 4). Reasoning backward based on a vision of a circular economy in 2050 (see Part 2, chapter 2), the Council arrives at three objectives that could be guiding in terms of a transition path for the State. The government should establish such targets in a national transition agenda 'circular economy'. In line with their scale levels, the provinces, regions and municipalities could next carry out something similar.

Box 4. Three overarching objectives for a circular economy

Goal 1: Reduce dependence on the import of raw materials

To develop a stronger economy, the control on essential resources must be maintained and increased. This can be achieved by reducing the dependence on imported raw materials. The Council considers this a Europe-wide challenge. Reduced dependence can for example be achieved by:

- encouraging companies to organise their chains in such a manner that residual flows can be used in the processes of a similar or different chain (for example through the requirement that by 2030, every product launched in the Dutch market must consist of recycled materials for X% in 2030 and Y% in 2050).
- developing a circular 'ladder' (similar to, for example, the ladder of Lansink and the SER-ladder[6]). The nine levels of circularity can be included in that ladder: refuse, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and, in conclusion, recover (see Part 2, section 1.2). The use of primary raw materials for example is allowed, provided that these materials have been assessed against the nine levels of circularity in a demonstrable manner.

Goal 2: Achieve economic prosperity

The Netherlands can benefit from playing a leading role in a circular economy. The contribution to economic prosperity can be achieved in various ways, for example by:

- encouraging companies to aim for increasing the economic profits in business processes by setting targets for eco-efficiency. Because of these goals, companies may (even more than before) ascertain where the use of resources can be prevented and reduced, so that more product of service can be delivered per unit of raw materials.
- improving the investment climate by facilitating a hundred 'circular' start-ups per year in the Netherlands. This contributes to the development of the Netherlands into a circular hub.
- facilitating and stimulating new economic activities through innovative revenue models (such as X pilots in 2020 for sharing, leasing and dematerialising).
- stimulating the creation of new jobs related to the circular economy (for example, 25,000 direct jobs in 2030 and 100,000 in 2050).

Goal 3: Reduce environmental impact and/or increase economic added value of raw materials

The environmental impact in chains can be reduced by using fewer resources and reducing the generation of waste. Thus, the supplied economic value is increased, for example by:

- encouraging companies to create more functionality per unit of raw

6 Ladders which are based on a number of design principles. For example, think of ladders similar to Lansink's Ladder (waste prevention, reuse, incineration, landfill), the Flemish priority ladder for dealing with materials (prevention, sustainable production and consumption patterns; reuse; recycle, close material cycles; useful applications, removal of waste materials). Verdaas' Ladder (spatial planning, pricing policy, mobility management, public transport, utilisation of existing road infrastructure, reconstruction of existing road infrastructure, construction of new road infrastructure), Trias Energetica (restrict energy, sustainable energy sources, finite energy sources), the SER ladder (optimal restructuring, multiple land use, expansion), WB21 (retain water, store, drain).

material and become more eco-effective. Think about making use of the same resources multiple times, for example through reuse, repair and recycling (among other things by increasing the number of jobs in the repair and recycling sector with X in 2030 or by less CO_2 emissions and less energy and water consumption by X in 2030).
- encouraging the consumer to adopt sustainable behaviour (for specific recommendations: RIi, 2014a).

The Council realises that the formulation of strategic, overarching objectives will not solve all coordination issues, as becomes apparent from the examples of conflicting strategies in section 1.2. In practice, as many parties as possible will therefore need to be involved in the establishment of overarching goals, so that all parties are aware of each other's intentions in an early stage, consequently allowing the parties involved to consistently act and invest as well.

3.4 Step 3 of agenda: task division ministries based on inherent strengths

Recommendation 4 to the State:
Using the overarching goals as a starting point, develop an approach for each ministry based on the inherent strengths of that ministry and the strengths of the Netherlands

4a. **Minister of Economic Affairs:** Make choices in the promotion of and investments in sectors and promising chains that can serve as a figurehead for the Dutch circular economy

4b. **Minister of Foreign Affairs and Minister for Foreign Trade and Development Cooperation:** Develop a trade policy focused on a circular economy by instigating a so-called raw materials union package and by exporting Dutch circularity-related knowledge

4c. **Minister and State Secretary of Infrastructure and the Environment:** Ensure the right conditions for a circular economy in terms of infrastructure, logistics, health and environment

4d. **Minister of the Interior and Kingdom Relations and Minister for Housing and the Central Government Sector:** Set a good example through circular procurement and sourcing policy, oversight on circular building (public housing and government buildings) and use the theme of circular economy to further flesh out the Agenda Stad ('Urban Agenda')

4e. Minister and State Secretary of Finance: Incorporate the circular economy in the annual national Budget Memorandum, stimulate the financial sector to finance the transition, prevent lock-ins that impede a greening of the tax system

4f. Minister and State Secretary of Education, Culture and Science: Ensure continuous attention for the circular economy in various academic agendas and in the education curriculum

4g. Minister of Social Affairs and Employment: Study potential employment development in a circular economy, stimulate training programmes to make this development possible

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Each ministry has a number of key tasks. From these key tasks, the responsibilities of the ministry in question can be deducted in relation to the realisation of the joint overarching goals. The Council however feels that this is not just a matter of allocating administrative responsibilities, but also of utilising the expertise and strengths amassed by each ministry over the years in its own particular field. Based on the specific qualities of his or her ministry, each minister should contemplate the contributions he or she can make to the overarching goals.

Below are recommendations for possible tasks for the different ministries (in random order), specifically geared to the circular economy. Various tasks are currently already being fleshed out (through policy programmes such as 'From Waste to Resource' [VANG], 'Green Growth', 'Urban Agenda'); only those tasks which require further attention are further discussed here.

4a. Minister of Economic Affairs: Make choices in the promotion of and investments in sectors and promising chains that can serve as a figurehead for the Dutch circular economy

The Ministry of Economic Affairs is responsible for promoting a balanced economic growth and for example focuses on a competitive business environment to this end (Parlement & Politiek, 2015a). Among other things, this aim is given shape in a national enterprise policy. In the eyes of the Council, the circular economy should be given a more prominent position in this. After all, the Netherlands boasts various very strong starting points here. Think of the separate collection and processing of waste by companies and individuals which is commonplace in the Netherlands. Generally speaking, the Dutch business community is in the vanguard when it comes to knowledge on and experience with waste management. Quite an advanced processing structure has been established based on this knowledge. Besides waste collection and processing, the Netherlands is also in the lead regarding precursors to a circular economy such as cradle-to-cradle, eco-design and biobased economy (Cramer, 2015b). For instance, the Netherlands has experience with the cascading of bio waste flows and the use of organic waste products in new products (see Box 5). Furthermore, many Dutch companies, from multinationals and medium-sized companies to small companies and start-ups, are in the vanguard in the international transition towards a circular economy (e.g. Kargro, Vanderlande Industries, Rabobank, PGGM). The Netherlands therefore has a certain lead and this needs to be utilised.

Box 5. Residual flows from the food industry

Increasingly, residual flows from the food industry are being discovered as resources for new products. Dutch food companies annually produce almost one hundred million kilos of animal and plant waste. At present, these kinds of waste flows often still end up as animal feed or compost. However, more and more companies are acknowledging their value and are coming up with high-quality ways to make use of these residual flows. For example, The Greenery uses tomato stems which until recently were for the most part composted to make boxes. Leftovers from the processing of mushrooms (for example canning) that were previously discarded, such as blanching water and the base of the mushroom, are now used as a base for soups and sauces. Bonduelle incorporates its residual flows from the processing of vegetables in vegetable juices. Orange waste is used to make sound insulating material. And Mars has recently developed packaging for its chocolate bars which is based on potato starch, a by-product of the french fry industry. In this way, residual flows which cost growers and manufacturers money if they need to be disposed of as waste are transformed into a profitable product (Food Valley Update, 2015).

These strong starting points however should not be taken for granted. European legislation is forcing other member states to also establish structures for waste management and start encouraging circular company processes. The Council feels that a solid enterprise policy is therefore essential to safeguard the good starting points and to further expand and fortify the leading position.

The need for a strong enterprise policy is supported by a background study to the WRR report 'Towards a learning economy' (Faber, 2013). This states that market failures and a lack of coordination justify the development of an enterprise policy. According to Faber (2013), coordination problems are at play when innovative activities fail to 'organically' thrive, for example because market parties are unable to connect with one another, because the market for financing the activities does not function properly or because technology development and market articulation are not in sync. This certainly also holds true for the development towards a circular economy. In addition, a circular economy requires a new approach to investing; an approach which not only considers the demand for circular products, but also how the function of these products can be further developed in relation to the performance of the entire chain. This requires alternative investment patterns.

In 2011, the Minister of Economic Affairs implemented the national enterprise policy based on nine top sectors (Tweede Kamer, 2011a). Attention is already being paid to the circular economy in this so-called top sector policy, namely in the cross-cutting core theme of the bio-based economy and in the roadmaps for the top sectors. The Council however feels that a more prominent focus on a circular economy is justified (Tweede Kamer, 2015c). This could among other things be achieved by explicitly defining

the theme as being one of the social challenges.[7] The Minister has furthermore stated that work on these social challenges will be continued (Tweede Kamer, 2015d).

The Council wonders whether the nine top sectors are also the most promising for the Netherlands from a circular perspective and/or whether the principles of the circular economy, which besides biological chains also comprise technological chains, do not also comprise other, strong combinations of sectors. The enterprise policy should focus on solidifying the areas in which the Netherlands holds a strong position in a circular economy and on seizing opportunities. Choices need to be made in that respect; not everything should be focused on and areas which other countries are stronger in should actually be left up to *those* countries. Using the enterprise policy, a further analysis of the sectors and chains can help give direction to a circular economy.[8] The new enterprise policy must be firmly embedded in other policies such as science, innovation and education.

To determine which sectors and chains in the Netherlands have potential in a circular economy, the Council wants to offer a number of questions which may prove helpful in that respect (see Box 6).

As part of the enterprise policy, it may be possible for the State to act as a risk-bearing and/or enterprising investor. With this, the Council means that the State can serve as a reliable partner in radical innovations for both

Box 6. Questions that can help determine which sectors are relevant from a circular perspective:

- How important is the sector for the Netherlands (economically speaking)?
- How far does the chain extend (global, European, national, regional, local)? Can the chain be fully or partially influenced from the Netherlands?
- Is the Netherlands strong in combinations of certain sectors, making industrial symbiosis obvious? Or is the possibility to further develop this actually lacking in the Netherlands?
- Is the timing right? Sectors make products with different life spans. It makes more sense to initiate a circular economy when a sector is about to implement an innovation or close new product chains than when the investments already made (under the linear system) have not yet been recuperated.
- Is the Netherlands a leading player in the sector? Or is much more expertise available beyond the Netherlands? Are companies able to compete internationally in the sector?

7 The Enterprise Policy Monitor (Ministry of Economic Affairs, 2014) states which top sectors contribute to the seven social challenges of the Seventh Framework Programme of the EU. Climate, resource efficiency and raw materials is one of the social challenges.

8 The RACE Coalition is conducting a study into three chains in the Netherlands in which the transition to a circular economy can be realized. RACE stands for 'Realising Acceleration towards a Circular Economy'. RACE is a coalition of various civil society organizations: CLICKNL | DESIGN, Circle Economy, MVO Nederland, De Groene Zaak, Het Groene Brein and RVO. The coalition is working on seven themes which are to promote a circular economy in the Netherlands. Each theme is led by an organisation and has partners such as TNO, IMSA and Acceleratio. The RACE Coalition is supported by the Ministry of Infrastructure and the Environment. In addition, the Ellen MacArthur Foundation & Granta Design (2015) have developed indicators that show the extent to which products and companies have progressed in the development towards a circular economy.

- What impact do European and national policies have on the sector? Have many things been legally established or entrenched? Are there opportunities to experiment?
- How high is the external pressure on the sector? Do legislation, social pressure and environmental pressure for example make a circular approach necessary?
- How much willingness is there among the various stakeholders to cooperate?
- Is there a market in the Netherlands that can serve as the dynamo for the transition to a circular economy?

start-ups and large companies. Another possibility is that the State actively buys relevant patents and makes them available to companies that want to start operating circularly. According to Mazzucato (2011), governments worldwide have always been responsible for radical innovations to begin with. In that sense, the government is the largest venture capitalist. Without the massive support of the Dutch government and the European Union (EU), ASML would not exist (Bregman, 2015). The Council advises the government to also continue acting as a risk-bearing investor in a circular economy, even though this may not always result in a sought-after breakthrough.

4b. Minister of Foreign Affairs and Minister for Foreign Trade and Development Cooperation: Develop a trade policy focused on a circular economy by instigating a so-called raw materials union package and by exporting Dutch circularity-related knowledge

The task of the Ministry of Foreign Affairs is to prepare, coordinate and implement foreign policy. This among other things includes European cooperation, the coordination of European and international environmental policy and development aid (Parlement & Politiek, 2015b). Based on this expertise, the ministry has a task to play in the field of the circular economy as well. After all, the circular economy is not confined to the borders of the Netherlands or Europe. Parts of some value chains lie elsewhere in the world, for example regarding the exploitation of resources or the production of semi-finished or finished products. Recycling or waste treatment sometimes take place elsewhere in the world as well. The policy of the Ministry of Foreign Affairs increasingly focuses on the external effects of these kinds of activities in low-wage countries. Think of the illegal dumping or processing of waste in Africa or the manufacturing of textiles in Asia under poor working conditions.

The Ministry of Foreign Affairs is involved in the realisation of the sustainable development goals (SDG's) (United Nations, 2014). These SDG's are universal goals, targets and indicators which the members of the United Nations aim to use to gear their (policy) agendas to for the next fifteen years. In the opinion of the Council, a circular economy could be one of the

policy instruments of the Ministry of Foreign Affairs to shape some of these goals in terms of both foreign and domestic policy.

Another focal point in the policy of the Minister of Foreign Affairs is the current practice of contract management for the supply of resources. For 54 critical raw materials, Europe depends for 90% on the import of raw materials from beyond the EU. Despite the EU acknowledging this dependence and the policy which is being pursued to decrease this (see Box 7), each country currently still enters into separate contracts with non-European countries for the supply of resources. This leads to competition among countries and may result in countries being pitted against each other.

Box 7. Elements of the European raw materials policy:

- The prevention of protectionism on the part of non-EU countries, among other things through the 'Raw Materials Initiative' (European Commission, 2008);
- The promotion of sustainable mining and extraction of resources, among other things through the 'Flagship Initiative' (European Commission, 2011a), 'Communication Raw materials and Commodity Markets' (European Commission, 2011b);
- The reduction of dependence on raw materials by making more efficient use of them, by encouraging the use of residual materials and by promoting recycling, among other things through the 'Roadmap to a Resource Efficient Europe' (European Commission, 2011c);
- The further studying of raw materials, among other things through Horizon 2020 (European Commission, 2011d).

Following on the energy union package presented by the European Commission (European Commission, 2015a), the Council feels that a raw materials union package could be drawn up. The energy union package is aimed at reducing Europe's dependence on energy from elsewhere and spurring European countries to pull together in importing energy. The spearheads are: security of energy supply, sustainable energy, efficiency, internal energy market and research. At present, the implementation of the energy package seems to be limited to ensuring transparency through the pre-assessment of contracts with gas suppliers (both public and private contracts) by the EU. This prevents the inclusion of provisions which run counter to the agreements between EU member states (such as the agreement to absorb each other's energy shortages).

The Council realises that more transparency in terms of resources can constitute a first step. But ultimately, more is involved. Preventing the unnecessary use of raw materials, making efficient use of resources and the sustainable extraction of raw materials (all the steps in the ladder of circularity) are also relevant here. The Council is aware that such a package cannot be created overnight and therefore offers a possible roadmap to achieve such a raw materials union package:

1. One single European vision on a circular economy: Europe develops a lot of policy for raw materials. But concrete arrangements for a common

direction and for country-specific directions (also see recommendation 8, chapter 5) are lacking. Clarity in terms of the direction that Europe is heading in and the areas which individual countries will be specializing in will provide the business community with certainty and trust, which in turn benefits the investment climate. Supply security for resources is not the only theme in this vision; themes such as resource efficiency and value creation (economic opportunities) are inextricably linked to this. Pilots are underway in smaller groups of countries (see Box 8).

2. Gaining transparency in terms of raw material contracts. The same methodology can be used as for the energy union package.
3. Obtaining approval from the European Commission for contracts.

Box 8. Establishing a lead group

The idea of a North Sea Roundabout or a body such as North Sea Resources, in which countries on the North Sea function as a materials roundabout (Vaste Commissie voor Infrastructuur en Milieu, 2015), appeals to the Rli. Through a materials roundabout, countries aim to benefit from each other's infrastructure for raw materials and thus help each other towards achieving a circular economy. As a first step, the Council sees the possibility that countries start accepting each other's quality systems (recommendation to the Minister of I&M, see recommendation 4c below); this will make the transport of residual flows across borders (EVOA Directive, Europees Parlement & Raad van de Europese Unie, 2006) easier.

4c. Minister and State Secretary of Infrastructure and the Environment: Ensure the right conditions for a circular economy in terms of infrastructure, logistics, health and environment

The Ministry of Infrastructure and the Environment (I&M) bears responsibility for spatial planning and traffic, water and environmental management (Parlement & Politiek, 2015c). With the 'VANG' programme, the ministry has been particularly active in the field of the circular economy in recent years, resulting in appealing interim results (Tweede Kamer, 2015c). The Council believes that the knowledge amassed by the ministry in this respect should be widely used for the other ministries. Due to the specific task the Ministry of I&M has regarding the redesign of waste legislation, the Council recommends to consider whether the ladder of circularity (see recommendation 3) should be incorporated in policies and/or legislation.

Environment and health

The ministry determines the preconditions under which activities are allowed to take place in terms of the environment and health. Until now, these preconditions alone have not always been sufficient to promote a circular economy (see Part 2, chapter 3, Barriers to a circular economy). In many areas, work is currently underway to eliminate barriers, such as signing Green Deals on various aspects of a circular economy (in collaboration with the Ministry of Economic Affairs) or the interpretation and enforcement of the rules governing the cross-border transport of waste.

In addition to eliminating barriers, the Council sees it as a task for the ministry to draw up a quality index for recycled materials. This is because the creation of transparency is important regarding the quality of recycled raw materials. Subjects related to this index, such as labels for raw materials, resources passports, chain information systems and a material circularity indicator (Ellen MacArthur Foundation & Granta Design, 2015) have already been widely discussed. All are aimed at the development of thriving markets for recycled materials. These markets are currently experiencing barriers. For example, in practice parties are still reluctant to process recycled materials in products because questions exist about such things as quality, processing options, toxicity and visual characteristics. Although marketplaces for the biobased economy have now been created which link supply and demand, information about the components of the biomass flows, their volumes and their availability (e.g. seasonality) are still lacking, thereby inhibiting the development of the biobased economy. Getting a grip on the quality of secondary raw materials is important to ensure these raw materials are reused as optimally as possible. After all, manufacturers will not take any risks if the quality is questionable.

A study into the feasibility of raw material labels (by Royal HaskoningDHV, 2014, commissioned by the Ministry of I&M) shows that the required information (content) of such a quality index must be functional for the parties that collaborate in specific chains. So a new label (such as eco-label, certifications, standards, certification systems) or a new generic label are not involved here. The progress report on the 'VANG' programme (Tweede Kamer, 2015c), which also refers to this study, states that the ministry is waiting for the business community to launch initiatives. De Groene Zaak is working on this and is trying to launch a number of pilot projects together with lead group parties, but is still awaiting funding from Europe. The Council advises the ministry to maintain a pro-active stance and points

to the steps that can be taken according to the feasibility study and in respect to which the government has a clear function for a quality index (see Box 9).

Box 9. Some recommendations by Royal Haskoning DHV to the government for a commodity information system

"The government needs to act even more as an active network partner - and not just for the lead group parties – by:

- facilitating and stimulating the pilots which are to be further determined by the sector leaders;
- assisting to communicate successful pilots;
- organising cross-sectoral meetings to stimulate mutual learning; besides lead group companies, middle and end group companies must emphatically also be invited to these meetings;
- stimulating and sharing new knowledge and information technology (about raw materials) [...]" (Royal HaskoningDHV, 2014).

In the opinion of the Council, a customised approach for each commodity and each chain is essential. Based on the above, the Council therefore asks the Secretary of State to develop a quality index for recycled resources together with the suppliers and potential users of secondary materials.

Logistics and infrastructure

In terms of logistics and infrastructure, a circular economy means a significant change in transport patterns and the size of transport flows. To anticipate this in policy, new concepts and mindsets must be developed. As is indicated in the RIi advice on logistics ('Dutch logistics 2040: designed to last', 2013), the national government's policy for logistics is characterised by thinking in terms of networks, in terms of logistics operations, in terms of supply chain management and in terms of logistics as a priority. A circular economy will however alter the chains and networks and logistics must anticipate this. As a result of this change, policy will need to be adjusted as well. The following developments are relevant in that respect (RIi, 2013):

- Globally, there will be an increase in nearsourcing. In a circular economy, in which reuse, repair, refurbish and remanufacture are important components, the total chain costs become even more important, making it more attractive to manufacture close to consumers (see Part 2, section 1.3.1).
- At the national level, this will have consequences for the transit function of the Netherlands. 6% of everything which is supplied by air, sea or land (98 million tonnes of the 1,701 million tonnes in 2013) is moved to the European hinterland or to other parts of the world without further treatment (KiM, 2014). The question is how this transit function will develop in a circular economy. The idea is that fewer resources will be used (refuse, reduce and recover). As of yet, the significance of this in terms of transport movements is unclear. The same applies to the mainports (Schiphol,

Rotterdam and the digital mainport). This needs to be studied in greater depth.

- At the regional and local levels, the number of cargo movements will increase if smart logistics solutions are not pursued. Through reuse, repair, refurbish, remanufacture, repurpose and recycle, increasingly more diverse transport movements will emerge.

4d. Minister of the Interior and Kingdom Relations and Minister for Housing and the Central Government Sector: Set a good example through circular procurement and sourcing policy, oversight on circular building (public housing and government buildings) and use the theme of circular economy to further flesh out the Agenda Stad ('Urban Agenda')

The Ministry of the Interior's responsibilities include the management and organisation of public administration, all matters pertaining to living and building and state-owned real estate (Parlement & Politiek, 2015d).
In addition to the initiatives which are already ongoing, the Council has indentified three key points for circular policy for this ministry.

Firstly, the Ministry of the Interior and Kingdom Relations should focus more on making the construction and demolition chain circular. With construction and demolition-related waste accounting for about 40% of all waste flows in the Netherlands, this is a major flow (Cramer, 2015b). At present, measures towards a circular economy are already being taken in this respect (see Box 10). For example, pilots are underway involving the mandatory collection of materials and/or semi-finished products by the supplier; the choice of materials (which are suitable for a second life) and energy-conscious building are under consideration. But also, more and more new buildings are designed in such a manner that they can fulfil a different function after use (the construction of buildings for independent living, moving along with market demand, et cetera). In cases where this leads to practical barriers, the Minister can provide room for experimentation.

Box 10. Green Deal Circle City

In the Green Deal Circle City, parties - inspired by the Rotterdam initiative 'Circle City' - commit themselves to closing the loop of construction and demolition. The aim is to demolish in a sustainable manner and to return the demolished materials back to the construction chain as optimally as possible. Practice has shown that sustainable demolition can compete with traditional demolition because it yields more high-quality reusable materials and involves lower incineration and landfill costs. However, on average the labour costs are about 10% higher. The Green Deal Circle City agreement was signed on October 2, 2014 between the Rotterdam Circle City partners and the Ministries of Infrastructure and the Environment, Economic Affairs and the Interior and Kingdom Relations. The major challenge for these Green Deal partners is to establish a market-based approach in at least five other cities (Cramer, 2015a). Various cities have already signed up for this.

A second focal point relates to the procurement and sourcing policy. Combined, government bodies currently purchase sixty billion euros worth annually. These are mainly local authorities: about 42.8 billion euros in 2007 (Remmers, 2015). This is a substantial amount which the authorities can use to promote the realisation of circular economy. In a linear economy, products are purchased and services contracted out. In a circular economy, these two will increasingly overlap. After all, contrary to sustainable purchasing, circular purchasing does not only assume the demand for circular products but also the demand for fulfilling a function (e.g. light hours instead of bulbs), taking into account the performance of the entire chain. Sometimes, this will mean the decision to provide a product (see Box 11, example Desso), sometimes to provide a service. This means that products or services that are purchased or leased must be based on circular chains.

Box 11. "Desso and ProRail sign contract on sustainable new construction Utrecht

Desso, an international manufacturer of carpets and sports fields, has signed a contract with ProRail Facility Services for the sustainable furbishing of the newly constructed Traffic Control Centre Utrecht. The contract is one of the first in our country to be based on the 'Green Deal Circular Procurement' and thus on circular starting points. The initiative is aimed at reusing or recycling products, materials and raw materials and with that the optimal utilisation and where possible extension of the lifecycle. ProRail's new Traffic Control Centre is expected to open in the spring of 2015. With the new method of procurement, Desso and ProRail hope to stimulate the market for circular products" (Vastgoedjournaal, 2015).

Important in that new procurement and sourcing policy is that functional requirements may be imposed rather than technical specifications. The Key Performance Indicators (KPIs)[9] should focus on the creation of value throughout the lifecycle, as is the case when the ladder of circularity is used, and not on cost savings in the procurement phase. The Council recommends a step-by-step approach in which procurement and sourcing increasingly become more circular and companies are given the opportunity to adjust their procedures in this respect. The proposed quality index of the Ministry of I&M (recommendation 4c) and the revised European Procurement Act (see Box 12) can prove helpful in that respect. It is especially through the gradual introduction of more circular procurement and sourcing criteria that the potential losers in a circular economy, such as the suppliers of primary raw materials who have little to gain from a circular economy and who oppose the introduction of new secondary products in the market, will start seeing opportunities for a transformation towards a circular economy. These potential 'losers' are further addressed in section 3.5.

9 A Key Performance Indicator (KPI) is a measuring method used to quantify management objectives; think of quality, lead times, et cetera.

Box 12. Revised European Procurement Act provides instruments for fairer price comparison

Articles 67 and 68 of the revised European Procurement Act (Europees Parlement & Raad van de Europese Unie, 2014) offer the opportunity to create incentives to request 'circular tenders'. A requirement can be put in place that external environmental effects be passed on in MEAT[10] projects, such as true pricing (True Price, EY, PwC & Deloitte, 2014). These kinds of bids will have fewer external environmental costs and therefore a higher chance of being accepted.

The State can lead the way by using procurement and sourcing policy to promote circular experiments and initiatives. Practice has shown that this is often cost-neutral or sometimes even more cost-efficient than acting non-circularly. This is especially the case if absorption costing across the entire chain is used as a starting point. Through smart procurement and sourcing in accordance with circular starting points, government bodies can act as important launching customers (see Box 13). Government bodies are launching customers when they, in their capacity of major purchasers, contribute to creating markets for innovative products, services or processes through procurement and sourcing policy. By doing so, they set an example for other parties who are thus encouraged to purchase the product or service (Janssen & Kooijman, 2008).

Box 13. Government as launching customer, an example

The Ministry of Defence has taken the initiative to reuse old uniforms and clothes. When purchasing new uniforms, the idea is to impose the requirement that these new uniforms must consist of a certain percentage of recycled material. The purchasing volume of a customer such as the Ministry of Defence enables entrepreneurs to close this textile loop: to collect old uniforms (ReShare and Scherpenzeel BV), sort them (Wieland Textiles and ReShare), fiberise them (VAR|Frankenhuis or a new player), spin yard (in Spain, Italy, Turkey), weave cloth (also in Spain, Italy, Turkey), and to tailor (Schijvens) them into new uniforms with a label (REMO, The Recycle Movement) which states the percentage of recycled materials used, the carbon footprint and the life cycle. Such orders help parties to connect with one another and allows for a textile loop to become closed rather than struggle to get off the ground without such government procurement (Source: Monique Blokpoel).

Thirdly, the Council requests attention for the theme of circular economy in the Agenda Stad ('Urban Agenda'). The aim of this agenda is to make even better use of cities and urban areas as growth engines for the economy. The State is the initiator of this agenda and invites cities and other stakeholders (such as provinces, knowledge institutions, companies and civil society organisations) to contribute to the agenda. Work is underway to achieve a

10 Most Economically Advantageous Tender.

widely supported long-term perspective on the city and the development of the Dutch cities network. To this end, they aim to charter social trends and technological developments and determine which transitions are necessary in order to remain globally leading in terms of competitiveness and quality of life (Agenda Stad, 2014). The Council suggests that this advice be used to further flesh out the theme of circular economy in the Agenda Stad.

4e. Minister and State Secretary of Finance: Incorporate the circular economy in the annual national Budget Memorandum, stimulate the financial sector to finance the transition, prevent lock-ins that impede a greening of the tax system

The core task of the Ministry of Finance is to implement general government policy into financial policy and into policies for financial institutions (Parlement & Politiek, 2015e). For the transition towards a circular economy, a solid supportive financial policy is of great importance. After all, companies wishing to start operating circularly must first be able to obtain adequate loans to this end from financial institutions. Due to the longer time line of operational management in a circular economy compared to a linear one, this can prove tricky. Current investments, for example in real estate and production facilities, must be paid off and converted to a circular situation. One of the tasks of the Ministry of Finance is the pursuit of a policy for the financial sector which allows for the smooth financing of the transition.

A second point relates to taxation. In the current system, labour is taxed higher than the use of primary raw materials. This stimulates production and consumption: both key processes in a linear economy but not in a circular one. The current tax on labour costs makes labour-related cost reductions very rewarding; entrepreneurs consequently strive for labour efficiency or decide to shift some of their activities to low-wage countries. In a linear system, innovations are often geared to eliminating labour. This adversely affects the transition to a circular economy. After all, a circular economy involves labour-intensive processes such as repairs, urban

mining, the provision of services and innovation geared to eco-design (The Ex'tax Project et al., 2014). Consumers too are not yet stimulated to opt for repair or services because it is often cheaper to buy a new product than to have it repaired. Furthermore, consumers and companies receive insufficient fiscal stimulation to minimise environmental costs (Parry et al., 2014).

The State Secretary for Finance is working on a revision of the tax system in which a greening thereof is also under consideration. The Council advises the State Secretary for Finance, as the first government member to be involved, to investigate which steps can be taken in the next tax reform to achieve a circular economy. In that respect, a distinction must be made between steps for the short, medium and long term. Clarity should also be created as to which steps are at the national level and which steps need to be put on the international agenda. In that respect, the possibility to first experiment in a smaller international context (for example, only with Sweden, Denmark, Germany, Luxembourg and Belgium) and to see what ideas the countries which surround us have also deserves consideration (see Box 14).

The Council realises that a tax reform in which labour is taxed lower and raw materials are taxed higher is a reform for the long term which requires in-depth research. However, the Council believes that it is necessary to start thinking about this and that the many studies that have already been conducted and the reports that have already been published (e.g. The Ex'tax Project et al., 2014; De Groene Zaak et al., 2015) must also be included in this. What are the barriers preventing the implementation of such a tax reform? The Council believes it is important to remain focused on the joint end goal in the current reforms so that lock-ins are prevented.

In conclusion: as stated in recommendation 2, the Council is of the opinion that a vision on a circular economy should be included in the annual national Budget Memorandum; the Minister of Finance is responsible for this.

Box 14. Proposals for federal measures for a circular economy in Flanders

In the context of a fiscal reform in Flanders, among other things the possibilities of shifting the tax burden from labour to other sources such as energy or the use of resources must be analysed:

- VAT reduction from 21% to 6% for certain labour-intensive repair services and second-hand products;
- Reduction in social security costs for repair companies;
- Review of the tax depreciation rules to more strongly encourage a more intensive use of products and capital goods of companies.

These different options are being analysed, by product and service category, by industry and by economic sector (FOD Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu & FOD Economie, K.M.O., Middenstand en Energie, 2014).

4f. Minister and State Secretary of Education, Culture and Science: Ensure continuous attention for the circular economy in various academic agendas and in the education curriculum

The Ministry of Education, Culture and Science (OCW) among other things focuses on the promotion of scientific education and scientific policy and the policy on culture and media (Parlement & Politiek, 2015f).

Knowledge development in the field of the circular economy is an important task for the Ministry of OCW, especially because this is a new field. The Knowledge Map Circular Economy ('Kenniskaart Circulaire Economie') provides an overview of the knowledge which is currently available on the circular economy (Groene Brein, 2015). It is clear that many questions still remain unanswered. The Dutch Organisation for Scientific Research (NWO) has designated the circular economy as one of the social and economic challenges. The idea behind these challenges is that they include inspiring research questions that have the potential to lead to breakthroughs (NWO, 2014). This is supported by forty scientists (Delft University of Technology et al., 2015) who have named the circular economy as one of ten social challenges which besides socially challenging constitute a scientific priority and are economically promising. Like the NWO, they with that designate the circular economy as one of the themes for the National Science Agenda (see Box 15).

Box 15. National Science Agenda

"Scientists, universities, colleges and the business community and civil society organisations and involved citizens will together determine the National Science Agenda. This comprises the themes which the scientific sector should focus on in the coming years. What are the scientific strengths and economic opportunities and which societal challenges must the Dutch scientific sector find a solution and answer to? In the National Science Agenda, the strengths of all the different parties are brought together and cooperation between scientific institutions, the business sector and civil society organisations is promoted. In 2015, the knowledge coalition, consisting of the universities, KNAW, NWO, VNO/NCW, institutes for applied research (TO2) and MKB Nederland, will further flesh out the agenda." (Rijksoverheid.nl, 2014)

The Ministry of OCW states about the science agenda (2014) that increasing competition simply makes it impossible for the Netherlands to excel in every field. Choices will therefore need to be made and there must be smart cooperation, also at the international level. In the opinion of the Council, the circular economy is a theme in which the Netherlands can excel and at the same time an area in which the Netherlands must look beyond its own borders as well. The Council therefore expects that this theme will hold a prominent position on the National Science Agenda.

The circular economy requires a different attitude and different skills. Therefore, the theme needs to be included in the educational curriculum of schools (from primary to higher education). The Council advises the Minister and the Secretary of State to request attention for this among these educational institutions.

4g. Minister of Social Affairs and Employment: Study potential employment development in a circular economy, stimulate training programmes to make this development possible

The Ministry of Social Affairs and Employment (SZW) among other things bears responsibility for the overall socio-economic policy, particularly policy pertaining to employment, labour and income and capital policy (Parlement & Politiek, 2015g).

For the transition to a circular economy, the question of how employment will develop is important. Several reports have already shown that a circular economy can contribute to employment through activities that are related to the circular economy (eco-design, repair, reuse, recycling, etc.).[11] The amount by which employment in the Netherlands will actually grow however requires further study. For example, the general expectation is that employment in specific sectors could increase in a circular economy through more eco-efficient operations (refuse, reduce and recover), the sale of used goods (reuse), maintenance and repairs (repair), the refurbishment of products, the production of new products from second-hand products (remanufacture) and the reuse of products for a different purpose (repurpose). The shift towards a circular economy is also expected to have an impact on indirect employment; think of logistics activities and brokerage activities (such as Markplaats and other sharing web platforms) in that respect.

But the degree to which circular economy-related employment will displace or eliminate other forms of employment is still unclear. Through the reuse of resources, there will be a decline in the manufacturing of new products (substitution). Less primary materials will be supplied. The fact that fewer new products will be sold (for example due to longer lifespan of products, more lease constructions, dematerialisation) is expected to impact the employment in (online) stores. Some companies will move abroad, relocate or be forced to discontinue their activities because the transition makes it impossible for them to further develop their activities, for example because of a diminishing turnover.

The ultimate impact of all these factors is difficult to predict at this point and warrants further research.

A second important task for the Ministry of Social Affairs and Employment is the anticipation of new skills of employees in a circular economy. After all, working in a circular economy requires different skills than working

11 Bastein et al. (2013); EPEA Internationale Umweltforschung GmbH (2014); European Environmental Bureau (2014); WRAP & Green Alliance (2015); Club of Rome (2015), see appendix B.

in a linear economy. For example, it is important that employees are able to more structurally look beyond their own sector, pay more attention to the entire chain et cetera. This also applies to civil servants, who will for example be confronted with different forms of procurement. The lowest bid in the short term no longer matters, but a bid for the entire lifespan of services or products. The notion to no longer purchase a product but procure a service requires a different mindset as well and this changes the relationship with the supplier. Moreover, the government-wide approach towards a circular economy means it must become even more obvious for civil servants from one ministry to start cooperating with civil servants from another ministry, with ministries which they have previously not or hardly cooperated, with new parties from society or with local authorities. This change in behaviour will necessitate the development of new knowledge and skills among government bodies and companies. The Council therefore advises the Minister of Social Affairs to explore the changing need for schooling and training and, if necessary, to focus on the creation of training opportunities among government bodies to achieve the behavioural changes which are necessary for working in a circular economy.

3.5 Step 4 of agenda: how to deal with losers

Recommendation 5 to the State:
Study the social effects of the disappearance of companies that lose out in a circular agenda and if possible link actions to this in the transition agenda

As with any transition, the transition to a circular economy will also have 'losers'. That is simply unavoidable: some companies lose their raison d'être in a circular economy. When discussing the losers, a distinction can be made between two categories.

The first category of losers, the parties that bring primary raw materials to market and use these, is given little attention in the discussion. In the wake of the economic crisis, many of these companies are currently mostly trying to survive in the linear economy. They do not benefit from a circular economy. These companies often do not yet think about the consequences of more prominent raw material shortages and fluctuating resource prices, factors which will inevitably affect their activities in the longer term. How should these potential losers be dealt with? The Council is of the opinion

that these companies are responsible for their operational management themselves. The Council does not advocate the large-scale bailout of companies or the buying-up of stranded assets. The Council also does not want to keep companies going at all costs. But companies must be prevented from starting to exert pressure on government bodies and other relevant parties to preserve the linear economy, for example by putting forth inappropriate arguments (incidents, short-term interest). The government must therefore offer clarity about the direction of the policy path as soon as possible. This will show the finiteness of the current (linear) paths and will give companies the time and opportunity to gradually prepare. It is also necessary for the government to consider the impact of the transition to the circular economy on society and on the losers. The Council therefore advises the government to first of all gain knowledge about the stranded assets: in which regions are the losers located? Who they are, which sectors are involved, which markets do they serve? Are the markets so socially relevant that replacement markets need to be found for them? Are the companies aware of what is about to happen? Can they be included in the transition by redefining their core business? The answers to these questions can make it necessary for the State, and the Minister of Social Affairs and Employment in particular, to engage these companies in consultation about the necessary development and retraining.

The second category which is often mentioned are the waste incineration plants (WIPs). These companies will be faced with a diminishing supply of waste flows to incinerate, forcing them to switch to other input flows or to phase themselves out. As an interim solution, the residual capacity of the Dutch WIPs is currently used to incinerate waste from other European countries. This allows for the investments which have already been made in the Dutch WIPs to still be partially recouped, preventing stranded assets. This however does affect the development of a circular economy in 'waste-supplying' countries. For example, there are positive effects in the United Kingdom, where waste was often still deposited rather than incinerated. By having British waste incinerated by Dutch WIPs, the UK is now able to pursue higher-grade processing technologies. On the other hand, the burning of Flemish industrial waste at Dutch WIPs actually hinders the development of a circular economy in Flanders. As in the Netherlands, residual waste is incinerated there. Now, an insufficient supply of waste materials remains for the Flemish WIPs, resulting in lower prices for the incineration of waste there. That has a negative impact on the return on investment in Flanders and therefore on the investments in technologies of a circular economy. This may hamper the reduction of the capacity of waste incineration plants (source: Dirk Uyttendaele). Both these cross-border effects and the undesirability of incineration from a circular point of view ensure that WIPs must continue their efforts to shift towards a circular economy in the long run. The responsibility for this lies with the waste treatment facilities themselves: due to an increasing lack of waste they will be forced to switch or to phase themselves out. This realisation is not new and the WIPs are now also starting to acknowledge this. For example, AEB will phase out the two oldest of its three installations in the medium term; at the same time, it is now already starting to invest more in circular activities.

4

TRANSITION AGENDA FOR PROVINCE, REGION AND (COOPERATING) MUNICIPALITIES: INHERENT STRENGTHS AND COHESION

It is especially at the regional and local levels that a circular economy will take place. This is where initiatives by groups of citizens take hold and companies unfold their circular plans. It is therefore an important scale level. It is the scale level at which regional and local authorities[12] can deploy a mix of measures to facilitate and encourage the development of a circular economy. Which mix of measures, goals and strategies is best suited for this is a subject for discussion and must be decided within the region itself. The Council has emphatically decided to not further explore this mix here as this requires area-specific knowledge which is available in the areas themselves. Many provinces, regions and cities are already fully engaged in a circular economy. The Council greatly values these initiatives and advises parties to build on each other's knowledge and experiences, for example by exchanging data through existing VNG or IPO (Association of the Provinces of the Netherlands) forums. The Council however does wish to offer regional and local authorities some recommendations (see Part 2, Section 1.3.3 for more background information and examples).

Recommendation 6 to provinces, regions and (cooperating) municipalities:

a. Make the transition towards a circular economy a policy pillar and as a first step to this end formulate a shared vision;
b. Based on the shared vision, formulate a number of overarching goals;
c. Using the shared strategic goals as a starting point, develop an approach for each government departments.

To achieve a transition towards a circular economy, it is not enough for the State to designate this as one of the central themes of government policy. Provinces, regions and (collaborating) municipalities can also create opportunities through the transition towards a circular economy. For that, they can adhere to the same method or system as outlined above by the Council for the State. Consequently, regional and local authorities would - in mutual exchange and coordination with the State, business sector, research institutions, citizens and civil society organisations (see the starting point in Chapter 3) - each be able to develop a decentralized vision on a circular economy. For regional and local governments too, the formulation of overarching goals and a specification for each government service will help them in shaping a circular economy.

Recommendation 7 to provinces, regions and (collaborating) municipalities:

a. Choose a circular strategy based on the inherent qualities of the region in relation to surrounding areas. To this end, develop insight into the qualities, circumstances and characteristics of a region and charter the raw material flows;
b. Further develop a mix on the basis of four circular main strategies: 'the zero waste region', 'the sharing region', 'the regenerative region' and 'the region of industrial symbiosis' (see Part 2, section 1.3.3);
c. Determine which elements need to be organised locally, supra-locally or supra-regionally.

12 The water boards are part of the regional and local government as well.

7a. Choose a circular strategy based on the inherent qualities

To formulate a solid circular strategy, it is necessary for provinces, regions and municipalities (if not already present) to first gain more insight into each party's specific qualities. What are the inherent strengths of the region, what are its qualities compared to other regions? What matters here are the specific strengths, socio-cultural traits (traditions, behaviour) and economic characteristics of a region (which companies and industries are located there?). Box 16 features two examples of so-called area-specific qualities.

Box 16. Examples of 'using inherent qualities as a starting point'

Noaberschap in the East Netherlands (Overijssel, Drenthe)

The eastern regions of the Netherlands have a long tradition of 'naoberschap' (neighbourliness) in which neighbours have a strong tendency to automatically help each other. It is a powerful, distinctive quality of this area. The principle of neighbourliness fits in well with the 'sharing economy' in which people for example share products, housing or a car. Noaberschap involves more than just the sharing of resources; when sharing services, knowledge and time are also involved. The involvement of the participating parties in the community is reflected in various social initiatives in the region. For example, in Duurzaam Hoonhorst (Sustainable Hoonhorst), a community near Zwolle, residents work together to strive towards an ecologically, economically and socially sustainable village. Noaberschap offers regions in the eastern Netherlands a trump card for building up a distinctive circular strategy.

Denim City Amsterdam

An example of how inherent strength, in this case of a city, is further expanded and strengthened is Amsterdam. This city is home to some of the largest jeans brands in the world, and therefore also the best developers and designers in this field. Amsterdam is attractive to denim brands due to its strategic position within Europe and its accessibility, but also because of the down-to-earth mentality of its inhabitants and the presence of creative entrepreneurs. Amsterdam was therefore the perfect location to establish 'Denim City', an innovative campus for the artisan denim industry. In Denim City, several major jeans brands like G-Star and Tommy Hilfiger, but also weavers, yarn suppliers, upcycling companies and educational institutions (Jeans School) work together to make the jeans industry more sustainable (dryer, cleaner and smarter). It is a place where innovators, students, entrepreneurs, visionaries and scientists meet and collaborate on technical innovations, education and upcycling and recycling (BNR Radio, 2015; Gemeente Amsterdam, 2013).

The opportunities for a circular economy can differ from region to region. One region may have a good starting position for the industrial exchange of flows, the other may have more potential in the field of recycling product parts or be strong in biological chains (for residual flows from the agriculture sector, phosphorus et cetera). Especially by developing insight into their inherent qualities in relation to other areas, these regions can be prevented from all pursuing the same goals in their strategy towards a circular economy. Also see Box 17, which shows that municipalities in the Amsterdam Metropolitan Area all make different choices.

Box 17. Choices in the Amsterdam Metropolitan Area

In 2014, the Amsterdam Metropolitan Region formulated a circular strategy in which the municipalities in the region have all made different choices. The municipality of Amsterdam is for example working with AEB on a strategy to switch from the incineration of household and industrial waste to reuse and recycling. And the municipal government is working together with water company Waternet Amsterdam to extract nutrients and other substances from the municipal wastewater. The municipality of Almere is giving priority to the development of a high-quality recycling and upcycling station and the creation of optimal value for biomass. In addition, Almere – as host of the Floriade in 2022 – will promote the zero waste city and local food production. The municipality of Haarlemmermeer will focus on the biobased economy, cradle-to-cradle construction and a test facility for start-ups in these areas (Cramer, 2015b).

An important step for gaining insight into inherent, area-specific qualities is the mapping of the 'metabolism' of a city or region (Ruimtevolk, 2015). Which flows come into and leave the area, and how big are each of these flows (such as waste, paper, water, biomass)? Which flows are already recycled or reused and which are not? Such an overview is also called a 'flow atlas'. By analysing the flows, opportunities for certain circular activities such as the use of residual flows from one company by another company nearby can be made apparent. Drafting flow atlases is not easy

and is currently not yet standard practice. However, experience has been gained with this in the past. In the context of the International Architecture Biennale Rotterdam (IABR) in 2014, the metabolism of Rotterdam was for example mapped (Gemeente Rotterdam et al., 2014). Regional and local governments can build on these experiences.

In summary, what matters here is:

- to ascertain which areas the province, region, municipality can specialise in: what are the relative strengths, so that these can be boosted?;
- to ascertain which major challenges and opportunities are present;
- to leave it up to other provinces, regions and municipalities to do what they are good at.

7b. Develop a mix based on four circular main strategies

For local governments, the waste phase constitutes the most direct reference point for a transition towards a circular economy. It constitutes the end of the chain: the collection and separate retrieval of household and industrial waste. The challenge is to expand this focus to next steps en route to a circular economy, in which waste will gradually be considered as resource (Cramer, 2014b). Steps to this end include returning waste materials to the cycle as optimally as possible, recycling resources, reducing the use of raw materials and product reuse. Municipal support for thrift shops and civic initiatives related to sharing and repairs fits in with this. Furthermore, local governments can give room to local innovation environments, the sharing of data and knowledge, local production and recycling, upcycling and repair (Ruimtevolk, 2015; Cramer, 2014b). Just as at the state level, deliberate procurement and sourcing policies of local governments are important to stimulate circular enterprises.

According to the French consultant Le Moigne (2015), measures to boost the circular economy can be globally reduced to four main strategies; each city, region or province can select its own mix from these strategies (see Box 18). The four main strategies are ‘the sharing region’, ‘the zero waste region’, ‘the region of industrial symbiosis’ and ‘the regenerative region’. In the opinion of the Council, a circular procurement and sourcing policy needs to be part of the selected strategy.

Box 18. Regional circular strategies

Sharing region

This strategy is geared to sharing or reusing products or services whenever possible, for example through SnappCar, Peerby or Marktplaats.nl. In addition to individual and private sharing, government bodies can also make available products or services (such as the white, public-use bicycles in National Park De Hoge Veluwe or making data publically available).

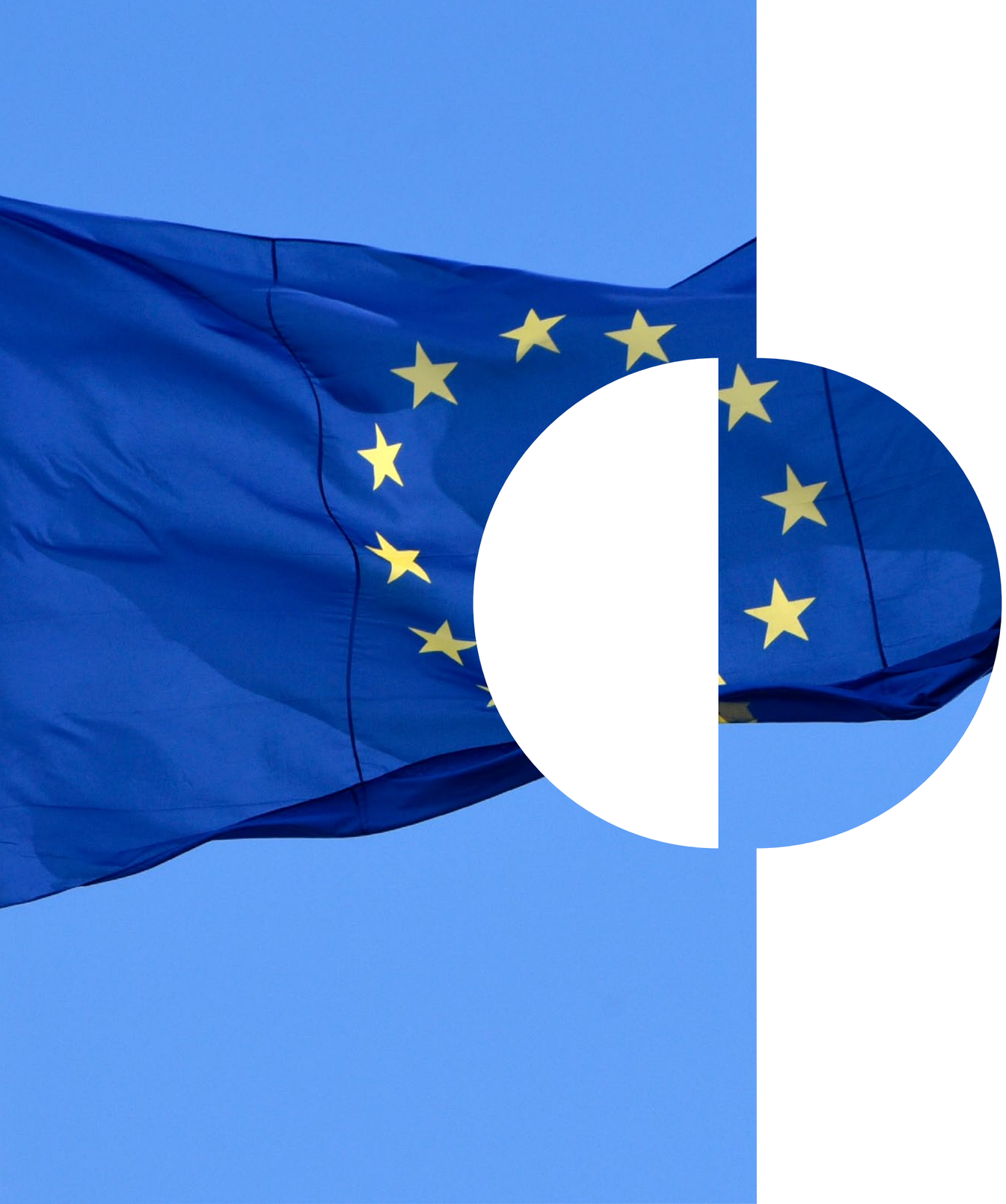
Zero waste region
In the zero waste region, as little waste as possible is deposited or incinerated by aiming for reduction and recycling. At the start of the chain, this means avoiding products which are difficult or impossible to recycle, and at the end of the chain ensuring that proper collection and processing methods are in space. Room should be created for this in the region; think of recycling centres and repair, recycling and upcycling stations. Activities and start-ups can grow around these initiatives.

Region of industrial symbiosis
In this strategy, the exchange of industrial residual flows is promoted. One company's waste constitutes another company's resource. In the case of industrial symbiosis, companies for example exchange steam or sludge. Biological flows are also suitable for exchange, such as dregs (a by-product of brewing beer) which have already been used for many years as animal feed by dairy farmers.

Regenerative region
In a regenerative region, the aim is that everything that is used in the region is manufactured, reused or recycled there. All the water, energy or phosphate required is produced or regained within the region itself. Closing the biological loops is an important part of the strategy of the regenerative region, such as closing the water cycle (Le Moigne, 2015, see Part 2, Section 1.3.3).

7c. Local or supra-local?

As soon as regional and local authorities have determined which vision they will strive for en route to a circular economy and which mix of strategies they can use based on their inherent qualities, the next step is establishing the respective levels at which things can best be organised. Which chains can be organised locally and which supra-locally or regionally, considering the scale size of the optimum business case and the organisation of the joint market for recycled raw materials into new products (via circular procurement)? Together with stakeholders, regional and local governments can analyse the possibilities that are present to close loops for each raw material flow (Cramer, 2014b, 2015b). It is likely that various regular cycle closures will take place in each region, such as household waste that is recycled. In addition, there may be specific flows in the region which require cycle closures at the regional or supra-regional level.



5

USING THE DUTCH PRESIDENCY OF THE EU IN 2016 FOR A CIRCULAR AGENDA

On the 2nd of July 2014, the European Commission at the time proposed a package of measures to stimulate a circular economy in Europe. This package comprised European recycling percentages, measures to phase out the dumping of biodegradable and recyclable materials and a new European methodology to harmonise the measurement of recycling percentages.

In February 2015, the current European Commission withdrew the EU proposals package for a circular economy for the following reasons:

- the need to consider the entire chain. In that respect, the use of recyclates in product design and the creation of a market for secondary materials is mentioned.
- the need to opt for a more economical approach which is consistent with the active support of new business models and sustainable growth.
- the need for policy which is more diversified to the various European countries in terms of waste policy, with achievable goals and an effective approach (European Environmental Bureau [EEB], 2015; European Commission, 2015b).

The Commission is expected to introduce a new package of measures in late 2015 in which customisation – rather than general goals - plays a central role. These measures will mainly focus on the direction and the right resources (European Commission, 2015b; Vieuws, 2015). Several agencies are offering advice as to what the package should entail. As an example, see Figure 1 of the European Environmental Bureau (2015).

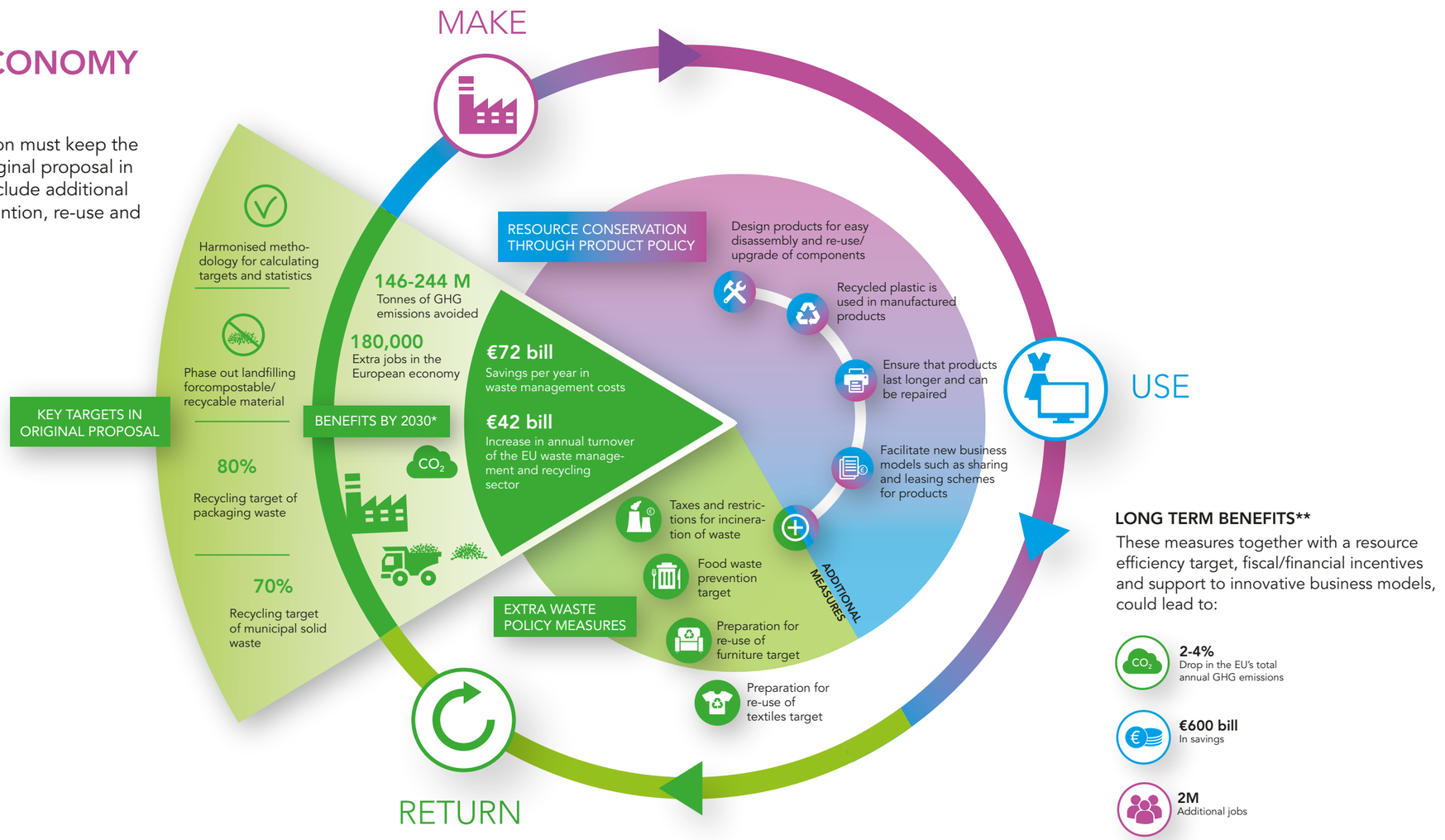
The Council would like to see the package comprise a shared European vision and goals. For the European policy, a similar methodology as for the national and regional level can also be used; first, formulate a vision, then overarching goals and next an approach per directorate.

From January 2016, the Netherlands will hold the presidency of the European Union for six months. A letter to the House of Representatives states that this presidency presents an opportunity to bring attention to issues which the Netherlands considers important, particularly during the informal meetings of different Council configurations (Tweede Kamer, 2015a). In the same letter, it is stated that the circular economy will be one of the three main themes on which the Netherlands will focus in the Environment Council.

Figure 1. Targets to be set for the CE package according to EEB (2015)

BUILDING A **CIRCULAR ECONOMY** IN EUROPE

The European Commission must keep the waste targets from its original proposal in 2014 on the table and include additional measures on waste prevention, re-use and product policy.



LONG TERM BENEFITS**

These measures together with a resource efficiency target, fiscal/financial incentives and support to innovative business models, could lead to:

2-4%
Drop in the EU's total annual GHG emissions

€600 bill
In savings

2M
Additional jobs

* Numbers according to the impact assessment of the European Commission
** Numbers according to AMEC Environment & Infrastructure & Bio Intelligence Service (2013) and Cambridge Econometrics & Bio Intelligence Service (2014)

The Council realises that the preparations for the presidency are already in full swing and that there is only little room left to make adjustments. During the Dutch presidency, the Council however still advises to strive for the formulation of a circular agenda at the European level, based on the same approach as outlined above for the national and regional levels. The Council is well aware that such an agenda cannot be further fleshed out during the presidency. This phase is mainly about placing elements of the circular economy on the agenda: that would already be a major step in the right direction. During the presidency itself, concrete steps could however already be taken in terms of the circular European procurement and sourcing policy.

Recommendation 8 to the government:
Use the European presidency in 2016 to draft a circular agenda based on the previously described approach. This means:

- put the theme of circular economy on the agenda through all the European Councils;
- develop a common European vision, in respect to which the Circular Economy package will likely prove helpful;
- define common goals;
- develop possible strategies to achieve a circular economy, including a proposal for a raw materials union package.

6

ORGANISATION

In this advice, the Council has presented its recommendations to optimally utilise the opportunities presented by a circular economy. Different actions at different scale levels are to contribute to this; something which involves many parties. It has repeatedly been stated in this advice that the cooperation between parties and the coordination between their efforts requires constant attention at all scale levels.

The question is how this cooperation and coordination can best be organised. How can a government optimally capitalise on the energy present in society among companies and citizens? How can companies, civil society organisations, research institutions and government bodies cooperate and how can ministries more easily connect with one another in that cooperation? These are pre-eminently governance issues which are relevant to each transition, including the development towards a circular economy. Besides learning to understand each other's language – important for a relatively new topic such as the circular economy – this is a matter of adopting new operational approaches. The changing relations in society between governments, civil society organisations, companies and citizens also make this necessary. In an earlier advice on the future of the city (Rli, 2014b), the Council has noted in this respect that the utilisation of social energy requires government bodies at all levels to adopt an open attitude towards new, flexible collectives and social initiatives and engage representatives of such organisations in consultation. A receptive attitude towards social initiatives geared to a circular economy needs to be cultivated. The more accurately the government is able to indicate what the long-term vision will look like and which developmental direction is deemed desirable in that respect, the better parties in society will know where they stand and which of their actions are appropriate. It is also necessary for government bodies to continue investing in cooperation, both between authorities (within one single layer and between different layers) and in a triple helix context (forms of cooperation between governments, companies and knowledge institutions) or even in a quadruple helix context (cooperation between governments, companies, knowledge institutions and citizen groups) – to which each party contributes from its inherent qualities. The Rli has also pointed this out in earlier advices (Rli, 2014b, 2015).

Adapting to new operational approaches and learning to speak each other's language cannot be achieved from one day to the next. This requires an administrative and cultural mindshift. This mindshift is already beginning to take shape in various manners, for example through the cooperation in Green Deals or the RACE coalition. This could be further expanded. Plenty of questions however still remain, such as the question on how to best organise the coordination of all the different actions.
Normally, a coordinating minister might be considered who monitors the progress of a circular economy, safeguards the integral nature and coordination and promotes the interaction between the various scale levels. But especially a theme such as circular economy requires an approach that transcends the sectors and ministerial levels. This makes it difficult to determine which minister can best assume this responsibility. Moreover, is this actually a smart approach, especially given the fact that a transition to a circular economy requires continuous learning and experimenting from the bottom up? This 'learning from each other' actually constitutes a different coordinational challenge: 'The Netherlands as a learning country'. With this in mind, wouldn't a 'matchmaker' or a 'free agent' not be more obvious choices? The Council has no doubt that work still needs to be done in terms of cooperation and coordination between and within the different scale levels. The best way to organise this however is not so clear yet. The Council would like to enter into dialogue about this issue and other points raised in this advice.

In the autumn of 2015, the Council will organise a stakeholder meeting (State, provinces, regions, municipalities, knowledge institutions, companies and civil society organisations), in which different forms of cooperation and possible follow-up steps to the recommendations in this advice will be further explored.

PART 2 | ANALYSIS

1

NECESSITY, DEFINITION AND OPPORTUNITIES OF A CIRCULAR ECONOMY

As stated in Part 1, the Council is of the opinion that there is currently a great need and opportunity to focus on a transition to a circular economy. This will be further substantiated in this first chapter of Part 2. Section 1.1 will consider the need for a transition. Section 1.2 will next list the core elements of a circular economy. In conclusion, section 1.3 will explore the opportunities a transition to a circular economy holds at various scale levels (European, national, regional/local).

1.1 Substantial need

The need for a transition to a circular economy is substantial. According to the Council, this need arises from: the high dependence on the import of raw materials (the fluctuating prices, increasing scarcity and uncertainty in terms of security of supply make the Netherlands and Europe vulnerable), the required strengthening of the earning capacity of the Netherlands and the increasing burden on the environment. These are further explained below.

Firstly, the Netherlands and Europe depend greatly on raw materials. The Netherlands imports 68% of its raw materials from abroad. In 2010, the Netherlands imported 161 billion kilos of raw materials. The indirect dependence on raw materials is even greater. If the raw materials for semi-finished and finished products are also included, then the amount of imported raw materials is three times greater (CBS, 2012). Europe too depends on imports for its raw materials. The European Commission has defined 54 critical raw materials for Europe; Europe depends for 90% on the import of raw materials from beyond the EU for these 54 materials. China is the main supplier (European Commission, 2014). That dependence leads to vulnerability. Shifting power balances and conflicts in key regions supplying these raw materials contribute to fluctuating raw material prices and uncertainty in terms of security of supply. In the period between 2000 and 2013, the volatility of raw material prices increased by a factor of three compared to the period 1990-2000 (McKinsey, 2013). Moreover, increasing scarcity has caused prices to rise. Since 2000, raw material prices have more than doubled on average, while they were still falling in the twentieth century. This poses ever-increasing risks for companies that depend on (non-renewable) resources. These developments make Europe vulnerable. The imported raw materials are often essential to Europe's economic activities, for example in the production of electronic devices. Even now, it is already becoming apparent that major investment decisions, such as that of Siemens to sell off its lighting division Osram, are taken with raw material-related considerations in mind (Quaedvlieg, 2015).

Secondly, it is constantly necessary to maintain and where possible improve the earning capacity of the Netherlands. In recent years, the economy has started to recover (Ernst & Young, 2015; De Nederlandsche Bank, 2014). Due to the heavy dependence on raw materials, the Dutch economy however continues to be vulnerable to fluctuating raw material prices, scarcity and uncertain security of supply. By capitalising on opportunities and reducing the vulnerability to these uncertainties, the

earning capacity of the Netherlands could be strengthened. A smarter use of raw materials can result in cost savings, innovation and new earning opportunities.

Thirdly, the ever-growing demand for resources means more pressure on the environment. The expanding world population is making ever-greater demands on natural resources: in the course of the twentieth century, the global population has started to consume 34 times more materials, 27 times more minerals, 12 times more fossil fuels and 3.6 times more biomass (UNEP, 2011). The demand for consumer products will increase further: according to UNEP (2011), a tripling of the global use of materials in 2050 can realistically be expected in relation to the base year of 2000. This means greater pressure on the environment. Extracting raw materials, manufacturing, consuming and waste processing lead to the emission of harmful substances, negatively impact ecosystems and require large quantities of water and (mostly fossil) fuels. Furthermore, many materials are lost: they are not reused at the end of their first application, but dumped in landfills or incinerated. These are factors that contribute to the transgression of the planetary boundaries: the boundaries which indicate the degree to which the natural system on earth can be burdened without resulting in structural damage to the planet. Globally, four of these nine planetary boundaries are now being exceeded, including those relating to climate change and biodiversity (Steffen et al., 2015). The European Environment Agency has concluded that more ambitious measures will be needed if they want to realise Europe's vision for 2050[13] (Europees Milieuagentschap, 2015).

According to the Council, a transition to a circular economy could yield an improvement in these three areas. This is further elaborated upon in section 1.3. First, the definition of a circular economy as used in this advice will be addressed.

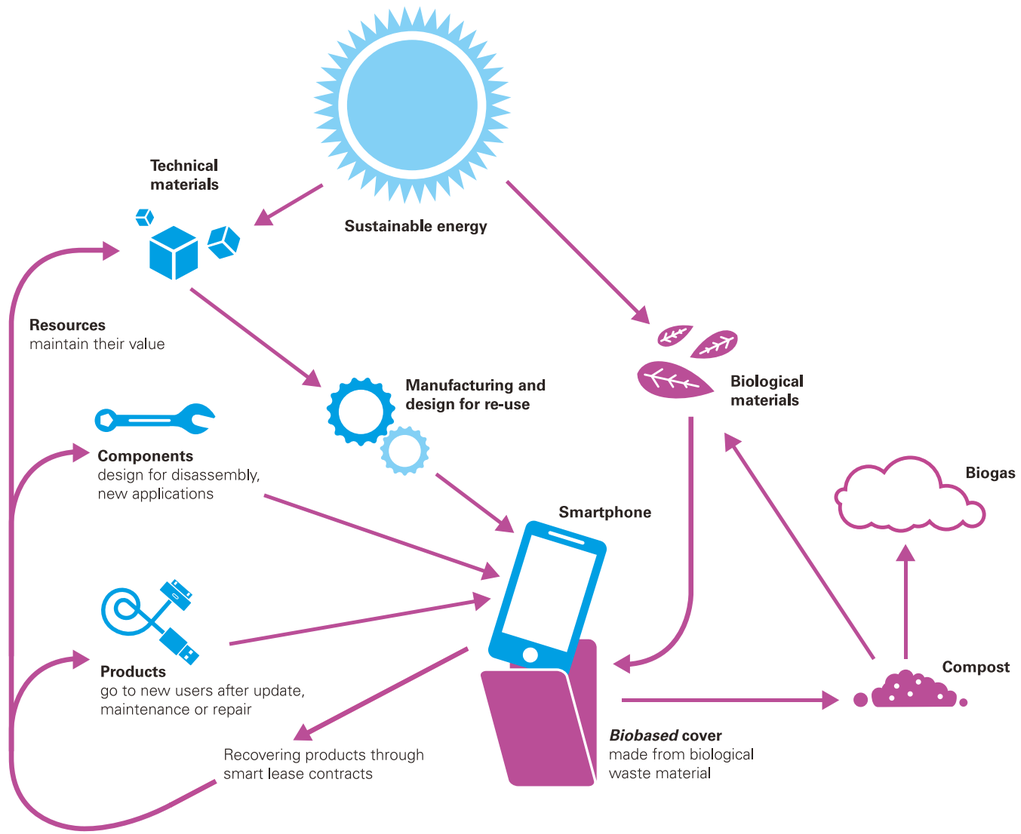
13 Aim Seventh Environmental Action Programme: living well within the limits of our planet (Europees Milieuagentschap, 2015).

1.2 Definition of circular economy

The principles of a circular economy have evolved in recent years. Unlike the current economy, which is based on the principle 'take-make-waste' (linear economy), the focus point in a circular economy is to not unnecessarily destroy resources. In discussions on the circular economy, this starting point is sometimes interpreted as the reduction of waste through recycling, but the principles of a circular economy encompass much more than that. Other focal points for example include reducing the consumption of raw materials; designing products in such a manner that they can easily be taken apart and reused after use (eco-design); prolonging the lifespan of products through maintenance and repair; the use of recyclates in products; recovering raw materials from waste flows. In the reports of the Ellen MacArthur Foundation (2013), this broad perspective on a circular economy is emphasised. A circular economy is defined as "an economic and industrial system that takes the reusability of products and raw materials and the resilience of natural resources as a starting point, minimises the destruction of value throughout the entire system and strives for the creation of value in each link of the system". [14]

The scope of the circular economy principles can be made apparent using an example: the production and the reuse of a smartphone. As is illustrated in Figure 2, a disassembly-oriented product design allows for the reuse of resources and components at a later stage. Old products can be given a new life after having been updated or serviced and biological residuals can be used to manufacture the case. Also, a company can maintain ownership of the raw material in the chain, for example by not selling products but by leasing them out (not shown in the figure). Furthermore, the company can save costs because less needs to be spent on 'new' materials or resources.

Figure 2. Circular chain for smartphone with case (MVO Nederland / Shootmedia in Rli, 2013)



14 Ellen Mac Arthur Foundation, in Bastein et al. (2013, p. 2).

The definition by the Ellen MacArthur Foundation, which the Council endorses, is highly comprehensive and indicates that a circular economy aims for the creation of economic value (the economic value of materials or products increases), the creation of social value (minimisation of social value destruction throughout the entire system, such as the prevention of unhealthy working conditions in the extraction of raw materials and reuse) as well as value creation in terms of the environment (resilience of natural resources). A circular economy is therefore one of the instruments for a sustainable society.

Box 19. Nine levels of circularity (Cramer, 2014a)

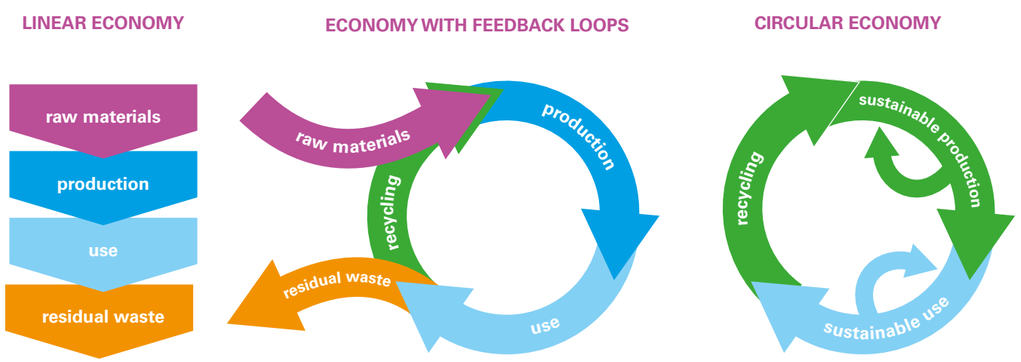
1. Refuse: preventing the use of raw materials
2. Reduce: reducing the use of raw materials
3. Reuse: product reuse (second-hand, sharing of products)
4. Repair: maintenance and repair
5. Refurbish: refurbishing a product
6. Remanufacture: creating new products from (parts of) old products
7. Repurpose: product reuse for a different purpose
8. Recycle: processing and reuse of materials
9. Recover: energy recovery from materials

The nine levels of circularity are about retaining raw materials in the cycle at the most optimum level possible. The circular design of products (eco-design) is a governing strategy for that.

In the literature on circular economy, a distinction is made between various gradations of circularity. This starts with the highest level of 'refuse' and ends with the lowest level of 'recover' (Cramer, 2014a). These different gradations are listed in Box 19.

The gradations of circularity also make clear that 'recycling' (the processing and reusing of materials) and 'recover' (recovering energy from materials through the incineration of residual flows) only constitute the two lowest levels of circularity. While recycling and recovery are at the heart of a recycling-based economy, a circular economy clearly entails more and comprises more levels. Figure 3 offers insight into a linear economy, a recycling economy (called 'economy with feedback loops' in the figure) and a circular economy. The recycling economy and a fully circular economy differ from each other in that the recycling economy does still involve the input of raw materials and the generation of waste, while the loops are closed in a circular economy. Energy by the way also plays a role in a circular chain. How a sustainable energy system can be achieved is the topic of a separate RIi advice which will be published later this year.

Figure 3. Differences between linear economy, economy with feedback loops and circular economy (Tweede Kamer, 2014)



1.3 Opportunities

The transition to a circular economy offers opportunities at various scale levels.

1.3.1 Opportunities for Europe

At the European level, the Council feels that a circular economy offers opportunities in the fields of supply security for resources, employment and the environment. This is further elaborated below.

According to the Council, there are firstly opportunities for Europe in the field of security of supply of raw materials. At present, Europe is still heavily dependent on the import of raw materials (see section 1.1 of this chapter). This may be different in a circular economy: because resources are retained in the economy for longer less needs to be imported. This enhances the security of supply: through resource management, Europe is able to exercise more control and is less dependent on the political situation in supply countries.

Secondly, there are opportunities for Europe regarding employment. Focusing on the recovery of raw materials from products in order to retain them in the economy for longer can result in job growth in Europe due to the greater demand for reuse, repairs and reclamation of raw materials. In the past, these kinds of activities were mainly shifted to low wage countries, mainly due to wage costs. But nowadays, the total chain costs are increasingly gaining in importance. This involves energy costs, transport costs, required technical skills, delivery times and environmental impact (McKinsey, 2012). This is one of the reasons why nearsourcing is increasingly gaining ground: the strategic positioning by companies of activities close to the location where the end products are sold (Rli, 2013). Nearsourcing also generates employment. A circular economy furthermore means more employment in the so-called 'eco-industry': the heterogeneously composed industry which provides services and products which counteract the deterioration of the environment and conserve natural resources.[15] Between 2000 and 2011, the eco-industry grew by over 50 percent; it is one of the industries which has had a healthy turnover

15 Examples are products and services which prevent air or water pollution, solar panels, recycling.

and employment since the start of the financial crisis in 2008 (Europees Milieuagentschap, 2015). It is expected that employment growth in certain sectors of a circular economy will result in the displacement or loss of jobs in other sectors, such as manufacturing, as a result of the longer lifespan of new products. On balance, various reports however assume employment growth (see Appendix B, which offers an overview of various reports which have studied the possible effects of a circular economy on employment in more detail).

In conclusion, a circular economy presents Europe with opportunities in terms of the environment. In 2013, 481 kg of domestic waste on average was generated per person; of this, 31% was dumped in landfills, 26% incinerated, 28% recycled and 15% composted (Eurostat Newsrelease, 2015). Note though that there are major differences between the EU member states. When resources are reused within Europe, this means fewer negative effects on the environment as a result of reduced extraction and mining (primarily an effect that occurs outside of Europe) and a reduced environmental impact in terms of production (remanufacture and refurbishment require fewer resources than the manufacturing of new products), dumping and incineration (within Europe).

1.3.2 National opportunities

A transition to a circular economy also presents opportunities at the national level. Although these opportunities are in the same fields as those at the European level (security of supply, earning potential and environment), they may play out differently in each country.

Firstly, opportunities are present on a national scale to conserve resources by retaining them in the economy for longer. The Netherlands has a good starting position for this: it has a long tradition in the field of separate waste collection and has a high recycling rate and low landfill rate in

relation to the rest of Europe (BiPRO, 2012). The Dutch waste sector was one of the first in Europe to acknowledge the value of waste and residual flows. Nowadays, the branch considers itself a starting point for a circular economy (Vereniging Afvalbedrijven, 2014). Dutch people have long been accustomed to separating their waste, such as paper, textile and glass. But more and more citizens are also cooperating in the separate collection of plastic packaging materials and electronic devices. In view of this culture of collection, opportunities are present for achieving (even) higher percentages of separate collection and, partially because of this, for more and potentially higher-grade reuse.

Secondly: just as at the European level, opportunities are also present at the national level in terms of earning capacity. These may however play out differently. After all, while a circular economy for Europe in its entirety may mean growth in the eco-industry, this growth does not necessary have to impact the whole of the Netherlands. Simply put, there are currently some recycling plants in Europe for coin cell batteries – there will be insufficient mass to support hundreds of these plants. Capitalising on economic opportunities involves a combination of entrepreneurship (companies that select a particular location) on the one hand and the unique combination of location factors that every country in Europe has to offer on the other. This interaction co-determines how a circular economy will take shape in a country and which impact the advantages of security of supply, earning capacity and environment will have at the national level.

Through policy measures, the central government can endeavour to create optimum location factors. Think of generic measures such as fiscal incentives or investments in education, for example, or physical measures such as investments in infrastructure. In addition, an enterprise policy is pursued: through this policy, the central government aims to support specific sectors in the Netherlands. In 2011, the government designated nine top sectors in the Netherlands to this end: high-tech, energy, creative industry, logistics, agri-food, horticulture and propagating materials, life sciences & health, water and chemicals (Tweede Kamer, 2011a). The question however is whether these sectors are also the sectors with which the Netherlands can best profile itself in a circular economy. The answer to that question will partially depend on the orientation of these sectors. For example, the chains of high-tech and life sciences & health are mainly globally oriented. The Dutch influence on such chains is limited. This applies less to other chains; furthermore, a mixed orientation is also possible (both global and regional, for example in agri-food). This mixed orientation provides more opportunities for Dutch influence in such a chain. Combined with the bio-based economy (a theme that runs through several key sectors), the agri-food sector has a good chance to become a forerunner in a circular economy. The sector 'water' is also a relevant sector en route to a circular economy (De Bourbon de Parme et al., 2015). The question of which sectors in the Netherlands have the best chances in a circular economy, either in conjunction with one another or not, has not yet been unambiguously answered. New research is being developed in this area which could further stimulate this (RACE theme 4, see footnote 8, Part 1).

In conclusion, opportunities for the environment are present at the national level as well. These opportunities lie partly in the above-described strong starting position of the Netherlands in the field of separate collection. Increased rates of separate collection, more and potentially higher-grade reuse of materials and even less incineration after all lead to less environmental pressure. Opportunities are also present in the manufacturing of goods: through refurbishment and remanufacture, environmental effects are reduced.

1.3.3 Regional and local opportunities

Similar to the European and national levels, opportunities for a circular economy are also present at the regional and local level. Here too, these opportunities comprise security of supply of raw materials, earning capacity and the environment. Exactly how these opportunities flesh out at this level depends on the local and regional situation. To determine the local and regional opportunities, each region must therefore gain insight into its inherent qualities in the area. Depending on this - and the most promising areas for development - a municipality or region can make choices regarding the direction it wants to pursue.

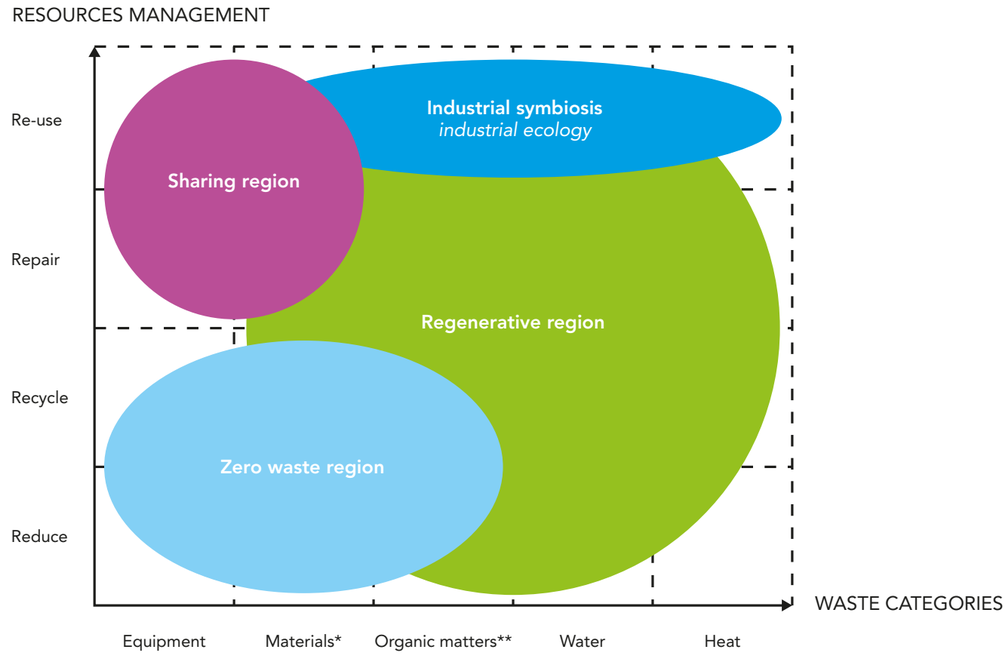
On the one hand, opportunities for each region may arise from the 'basic tasks' in the field of circularity, on the other from the specific qualities of the region. The basic tasks refer to the fact that a circular economy will always require the presence of certain basic elements. After all, a number of regular loops or cycles will need to be closed in each region, such as residual household waste flows which will need to be recycled. In addition, regional and local authorities must determine the specific challenges for their own areas. After all, material flows will be composed differently and run differently in each region. If a region has relatively substantial product flows that are too costly to physically transport over long distances, then opportunities are present for the development of a regional recycling industry. On the other hand, a region with more diverse flows that are all individually smaller in size has opportunities regarding the regional collection of these sub-flows: the bulking up and pre-sorting of sub-flows into larger flows so that these can be processed in the recycling industry. Locally, opportunities may also be present in the exchange of industrial residual flows and organic flows. This among other things depends on the economic activities that are already taking place in the various municipalities.

It is especially at the regional and local scale level that a circular economy takes shape. Regional and local governments can facilitate aspects of a circular economy and sometimes also consciously direct them. In that, they can choose a mix of measures which target the different levels of circularity (Cramer, 2014a), starting with the highest level of refuse and ending with the lowest level of recover (see Box 19). Amenities are required for all these levels of circularity. The impetuses for this are under development or already present in each municipality. Think of repair shops, thrift shops and of course waste flows that are already being recycled, such as paper, glass and plastics. In several regions in the Netherlands, strategies towards

a circular future are currently already being fleshed out (for example in the Rotterdam region and the Amsterdam region).

In each circular strategy, a combination is made of the nine levels (the R's); regional and/or local accents are added and other combinations are made. According to the French consultant Le Moigne (2015) four main directions can be distinguished for cities and urban regions in that respect: striving for a region with zero waste (especially reduce and recycle), strengthening the sharing economy (especially reuse), focusing on the regenerative region (all levels) and stimulating the symbiosis between industrial residual flows[16] (especially reuse: of materials, organic matters, water and heat) (see Figure 4).

Figure 4. Regional circular strategies (Le Moigne, 2015)



* Including plastic, glass, paper and cardboard, construction materials
** Including phosphate
The original figure of Le Moigne uses the city rather than the region as a starting point.

1. Zero waste region

In this strategy, as little waste as possible is deposited or incinerated by focusing on the reducing and recycling of waste. At the start of the chain, this means avoiding products that are not or difficult to recycle and at the end of the chain ensuring that proper collection and processing methods are in place. In addition to recycling centres, repair, recycling and upcycling stations will appear in municipalities. Around them, activities and start-ups may take hold. Cities like Paris and Gothenburg have been able to organise their municipal yards in such a manner that plenty of social and economic activities take place there which promote a circular economy. By making the yards viable, by making it interesting to take waste there, to share products or services and to sell or repair products (Mårtensson, 2014).

In the Netherlands, several initiatives focus on a zero waste city (see Box 20).

16 See footnote 4.

Box 20. Groningen en route to a zero waste city

The municipality of Groningen wants to become a zero waste city where all the waste is reused. To this end, it is working on a new plan for the collection and separation of waste until 2020, in line with the sustainability goals of the municipal government. Currently, 54% of all household waste in Groningen is separated. Of this, 39% is separated by residents at home. The remaining 15% is separated at the waste separation plant of waste management company Attero. According to the municipal government, this percentage has to be increased. The mayor and aldermen have established five variants for the collection and processing of household waste until 2020:

1. Maintaining the status quo;
2. Using additional actions to promote the separation of waste;
3. Extension of variant 2 by also separating plastic, PET bottles and beverage cartons at the source;
4. Reverse collection: the collection of recyclable waste is made easier for residents and the collection of residual waste more difficult;
5. Diftar (differentiated tariffs): who has more waste pays more (payment per garbage bag).

The mayor and aldermen aim to discuss the variants with the city council. The results of a survey conducted among members of the Stadspanel (City Panel) will be included in this. The municipality hopes to establish a new waste management plan at the end of 2015 (FocusGroningen, 2015).

2. Sharing region

This strategy focuses on the sharing or reuse of products (such as Airbnb, Peerby, SnappCar, OV-fiets (public transport bicycle) and marktplaats.nl) as much as possible. In addition to this private and individual sharing, it is also possible for government bodies to make available products or services (such as the public-use white bicycles in National Park De Hoge Veluwe). Seoul is an example of a city that is strongly focusing on becoming a sharing city (see Box 21).

Box 21. Sharing City Seoul

Seoul has more than 10 million inhabitants. The city is facing a number of significant problems. Because of strong industrialisation and high consumption levels, 49% of households are in debt and 9,000 tonnes of waste is generated daily. In addition, the city is strongly ageing and social isolation is a major issue (apparent through the increased number of suicides and low scores in terms of happiness). 60% of the inhabitants live in flats and apartment complexes which have as many as 1000 to 2000 residents. The city also has strong points: an excellent internet network and a good subway system. Using this infrastructure, the municipality has set itself the following goals: connecting people by providing sharing services, restoring confidence and sense of community, reducing waste and over-consumption and activating the local economy.

The municipal strategy rests on three pillars: change outdated legislation

and systems, support initiatives aimed at sharing and encourage citizens to share. The city provides the infrastructure (laws, institutions, social trust capital). In other words: the city paves the way for the sharing economy. It is seen as a creative public-private partnership.
The key activities are:

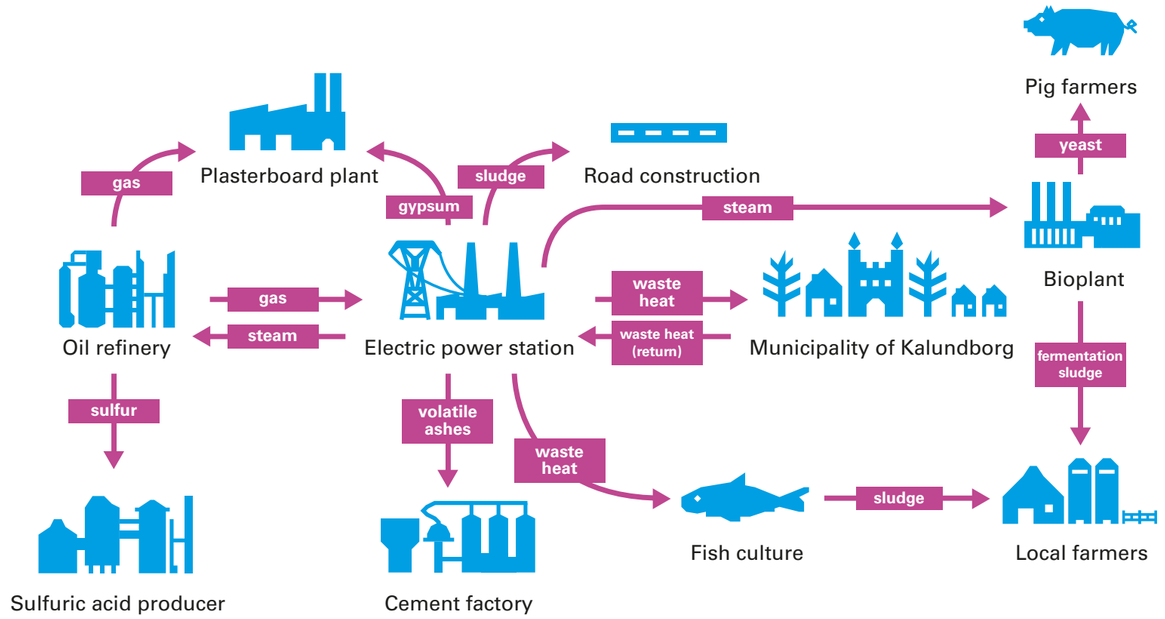
- Opening up public buildings for activities such as meetings when they are not used;
- Selecting a number of start-ups that receive meeting space, funding, training and advice;
- Establishing a share hub where you can find everything which can be shared in Seoul;
- Financially supporting Airbnb-like activities, exchange of children's clothing, sharing parking spots and products and so on;
- Start-up school that teaches people how to organise sharing activities;
- Initiating a project in which young people can rent empty rooms from old people to address the shortage of housing and social isolation among old people;
- The establishment of a youth club which brings together young people and encourages them to design their future;
- The sharing of cars;
- The mutual sharing of goods and services without the involvement of money;
- Open data: 1300 data are open to public;
- Libraries for books, tools and repair options;
- Public wifi has been made available at markets, parks and government offices;
- Making available image bank: 250,000 photos are available to the public (Johnson, 2014).

3. Regenerative region

The starting point in the regenerative region is that everything that is used is locally produced, reused and recycled. All the necessary water, energy or phosphate is self-produced, reused or recycled and neighbourhoods, cities or metropolitan areas are CO_2 neutral. Examples where regeneration is pursued are De Ceuvel in Amsterdam, EVA-Lanxmeer in Culemborg and Iewan-Strowijk in Nijmegen. Where the zero waste region is limited to reducing and recycling waste, the scope of the regenerative region is wider and includes all nine levels of circularity (refuse, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, recover). The emphasis in the regenerative region is the organic chain. Becoming regenerative in terms of food can also be a part of this. The degree to which food chains can be closed may vary.[17]

17 Van Steekelenburg (2012) distinguishes between a radius of 30 km (metropolis), 100 km (region) and 300 km (super region). Depending on the size of the population and use of land in these areas, various opportunities may be present to sell agricultural products and recycle waste flows; two themes for which distance is an important factor.

Figure 5. Industrial symbiosis in Kalundborg (Peck, 1996)



4. Industrial symbiosis

The exchange of residual flows promotes a circular economy. One party's waste can be another party's resource. Just as in nature, the waste of one organism is food for another. As such, companies can form an 'industrial ecosystem'. A good example of this is Kalundborg in Denmark (Figure 5). At Kalundborg, steam, several raw materials (e.g. sulphur), fly ash and sludge are exchanged between companies. An oil refinery, a plasterboard manufacturing company, a pharmaceutical company, a fish farm, a coal-fired power plant and the community work together in this system.

2

A CIRCULAR VISION OF THE FUTURE

For the transition to a circular economy, it is important to have a vision of a circular future (also see Rood & Hanemaaijer, 2014). At present, a widely supported vision is lacking in this respect. What will society look like in a circular economy?

2.1 Different scenarios and visions

In recent years, many organisations have attempted to explore (parts of) circular futures, often using scenarios. For example, the Netherlands Institute for Sustainable Packaging (KIDV) has developed four future scenarios for plastic packaging in which a circular economy is more or less given shape (KIDV, 2014). The British organisation Nesta (a charitable institution in the field of innovation) has developed scenarios for the 'collaborative economy' with different scale levels at which a circular future can take shape, from local to global (Nesta, 2014). The Ministry of Infrastructure and the Environment has also drawn up a vision together with the NVRD and the VNG (Ministerie van IenM, VNG & NVRD, 2014). The Social and Economic Council (SER) has asked HRH Prince Carlos de Bourbon de Parme to provide input for a future vision of a circular economy for the Netherlands. This input is expected early in 2016.

2.2 Future vision required for transition path

The Council too has pondered the question what society might look like in a circular economy. It has asked itself several questions in that respect, such as:

- Will Europe become as independent as possible from the rest of the world in terms of raw materials, with closed loops at the European level? Or will the level playing field also continue to remain a guiding principle in a circular economy, making it more likely for loops to become closed at the global level?
- Will manufacturers and consumers start paying a true price (also see glossary) for raw materials and products in the future? This among other things entails paying for environmental pollution caused by production, consumption or processing or paying for measures that prevent this environmental pollution. How does using or not using the true price impact the closing of loops?
- What meaning will possession take on? Will consumers start sharing to a far greater extent?
- What will innovation start to mean for a circular economy? Which products can be replaced by the Internet of Things?
- What will the attitude towards work be in the future? What will this work consist of? How many hours will the average Dutch person still be working then?
- How assertive will the citizen or consumer become? What does the consumer want in the future?

Answering these questions is difficult. After all, many uncertainties are in play, especially for the long term. A scenario study could prove helpful, but the drafting of scenarios is a complex and time-consuming task. This goes beyond the scope of this advisory process.

However, the Council still feels that the formulation of a vision of the future is necessary for establishing a transition path towards a circular future. After all, you need to know the direction you want to head in to determine which steps are required.[18] For this reason, the Council has drawn up a future vision; not as a scenario, but as a possible impression of a circular economy. This impression is a long-term future vision (target year 2050). It can be considered a vision of the RIi on a circular economy. In its development, the Council has built on existing scenarios from other organisations and the results from an RIi brainstorm session with experts on a circular future as seen from households (Expert meeting, September 2014).

2.3 RIi's future vision of a circular economy

In 2050, Europe is virtually self-sufficient in terms of raw materials. The already existing resources are retained in the chain for as long as possible. It has been embedded in Dutch law that residual flows and used products and materials are to be considered resources: the word 'waste' is no longer mentioned in the law. After use, materials are recovered and recycled as much as possible. Consumers clearly know what is expected of them when they no longer want to use products or parts of products. A product

18 The technique to arrive at actions that can be taken now by reasoning back from a vision of the future is called 'backcasting'. The advantage of this method over forecasting (predicting the future based on the present situation) is that it prevents only incremental innovation measures from entering the picture.

has value, also after being disposed of. This value is transparent, in the sense that there are thriving markets for used products, components and raw materials and citizens are aware of the value of used products and resources. Markets have been set up in such a manner that it pays to opt for recycled resources (secondary raw materials) over primary raw materials. This allows for loops to be closed and materials are used over and over again for new products. As a result, fewer raw materials need to be mined, resulting in less environmental pressure. Raw materials that are harmful to the ecosystem continue to circulate in the economy and do not end up in the environment. A wide range of renewable resources is available: raw materials that are extracted from plant materials that are subsequently reusable, recyclable and compostable after use.
Products are manufactured in such a manner that they last much longer. Interim repairs also prologue their lifespans. Products are only allowed in the Dutch market if they can be fully dismantled after use and if the materials or components can be reused. In that respect, companies have made major headway in the design of their projects. Far more attention is paid to possibilities for repair, reuse and recycling in the design phase. In their annual reports, companies have to assume responsibility for the raw materials used.

The circular economy has become socially accepted. Consumers know the choices they have when buying and using products. Good education is available which helps in making responsible choices. A true price is paid for products. Moreover, the definition of ownership has fundamentally changed: products are consumed as services more frequently. Leasing or renting products such as washing machines has become more obvious.
For products, functionality and aesthetics are no longer the only things that matter; lifespan, multifunctionality and the ability to also use components and resources again in an alternative fashion are of particular importance too. After use, people throw away as little as possible and any waste is disposed of separately. If products have packaging, then this packaging can be either used several times or is biologically degradable. People have easy access to clear waste disposal procedures, also for these packaging materials. The local infrastructure is fully geared to this.

Through its knowledge, technology and hands-on experience, the Netherlands has developed into the ‘circular hotspot’ of Europe. This means that the Netherlands is in the vanguard regarding new processing methods, waste separation technologies and education and research programmes in the field of circular economy. There is a stimulating investment climate for innovative companies that want to launch new circular technologies or products in the market. ‘The Netherlands as a circular hotspot’ comprises both a knowledge and innovation hotspot and a physical hub for the processing and separation of waste flows from Europe (through the use of logistics knowledge and infrastructure). The development into Europe’s circular hotspot has strongly boosted employment in the Netherlands, with more jobs which are directly or indirectly related to a circular economy.

2.4 In conclusion: a vision, not *the* vision

The vision mentioned above is explicitly an exploration of the future, a vision of the RIi, and is unrelated to current developments. This vision is surrounded by uncertainty; it is not a given that it will actually become reality. In its vision of the future, the Council has made all kinds of decisions and assumptions, for example regarding the level at which the loops will close (the vision for instance states that Europe is self-sufficient in terms of raw materials, so closed loops at the European level and not at the global or regional level).

3

BARRIERS TO A CIRCULAR ECONOMY

This chapter will discuss a number of barriers to the realisation of a circular economy; barriers which co-determine whether a circular economy will be able to come to full fruition. These barriers to a circular economy have been extensively studied. Based on a study of literature, the main barriers have been listed below. This overview is not comprehensive; barriers which have been mentioned in a number of important reports are involved here.[19]

The barriers are present in several areas:

1. Institutional barriers (e.g. vested interests);
2. Legal and regulatory barriers (existing laws and regulations sometimes inhibit innovation);
3. Economic barriers (among other things an emphasis on traditional business models);
4. Social barriers (e.g. lack of awareness, sense of urgency);
5. Barriers in knowledge and innovation (e.g. technological innovation)

(classification based on Cramer, 2014a; Circle Economy & IMSA, 2013).

In practice, the contents of these barriers overlap. The same barrier can for example be present at both the institutional and the economic level. For the sake of clarity, barriers are however only mentioned once in the sections below.

3.1 Institutional barriers

Several institutional barriers are in place in the Netherlands that impede the transition to a circular economy. These are structural barriers that have taken root over the years in daily practice, market structures and systems and which in their entirety maintain the linear economy.

Uneven playing field

A major institutional barrier is the fact that an uneven playing field has emerged in the Netherlands for companies that want to start with or switch to a circular economy. The current economic system is geared to a linear economy, which often offers linear companies advantages over circular companies in such areas as taxation, competition policy and other fiscal frameworks. This lack of a level playing field constitutes a barrier to the emergence or scaling-up of circular initiatives (Circle Economy & IMSA, 2013; OPAi & MVO Nederland, 2014).

Vested interests

Another institutional barrier is the possible resistance to a circular economy among parties with 'vested interests'. Generally speaking, vested interests can constitute a barrier in any transition[20], so also the transition to a circular economy. The raison d'être and economic returns of parties with such

19 These are the TNO report 'Kansen voor een circulaire economie' (Bastein et al., 2013); the report 'Unleashing the power of the circular economy' (Circle Economy & IMSA, 2013); 'Ondernemen in de circulaire economie' (OPAi & MVO Nederland, 2014); 'Reflectie op Van Afval Naar Grondstof (VANG)' (Rood & Hanemaaijer, 2014); 'Grondstoffenhonger duurzaam stillen' (Rathenau Instituut, 2014). Use has also been made of the literature overview 'Barriers & drivers towards a circular economy: literature review' (Van Eijk, 2015).

interests is dependent on the current state of affairs, the preservation of the status quo. In the case of the transition to a circular economy, this means the companies that have set up their business in accordance with the principles of the linear economy and which consequently also benefit from maintaining that economy. These may be waste incineration plants (WIPs), but also companies that are currently still largely dependent on increasingly scarce or difficult-to-obtain raw materials. If they fail to make the transition to a circular economy in time, they would lose out in that transition.

The large investments in existing WIPs and their great economic worth may impede the transition to a circular future (Bastein et al., 2013). The fact that vested interests may constitute a barrier for the transition to a circular economy by the way does not mean that linear companies and WIPs automatically stand in the way of innovation in the Dutch situation. On the contrary; the Dutch waste sector for example is actually highly dynamic in terms of anticipating these changes. Some companies are already working on a strategy adjustment for the long term.

Focus of companies on traditional chains or the short term

For a circular future, it is necessary for companies to find each other in order to initiate cooperation. After all, if companies want to start operating more circularly, they also often require other companies to close the loop, for example a company that wants to start using the 'waste' of another company as a resource. Several studies suggest that – barring some exceptions - parties are still insufficiently able to find one another for this (Circle Economy & IMSA, 2013; Bastein et al., 2013; OPAi & MVO Nederland, 2014). Companies need to be aware of each other's existence, interests and corporate strategies and this is still insufficiently the case at present. The Netherlands Organisation for Applied Scientific Research TNO states that industry associations are often still focused on traditional chains, which hinders the search for circular alternatives (Bastein et al., 2014). A short-term focus among shareholders could constitute another institutional

20 Also see the advice 'Remmen los' in which the Council points to the inhibiting influence of vested interests in the transition to a sustainable energy system in the Netherlands (Rli, 2011).

barrier in this regard. If the short-term interests of shareholders dominate, companies sometimes cannot reach a circular strategy with the long-term investments this requires (Circle Economy & IMSA, 2013).

GDP (gross domestic product) too limited as an indicator of progress

At present, the success of the economy is measured by the development of GDP (the total value of manufactured goods and services over a certain period). However, GDP does not show the actual progress and economic prosperity of a society. While GDP does measure economic growth, it fails to take into account the sustainability of that growth in an environmental and social context. Issues such as depletion, pollution and social effects are not included in the calculation of GDP. Moreover, much of the progress achieved through innovation (important in a circular economy) is not seen as economic growth (Circle Economy & IMSA, 2013; Rabobank, 2014). If economic progress is measured in this way, it only offers insight into the short term, from a limited perspective on prosperity. The success of a circular economy is hampered by this.

3.2 Legal and regulatory barriers

Current legislation and regulations are aimed at a linear economy. As a result, some aspects in (national and European) legislation may impede the transition towards a circular economy. Some of these aspects are discussed below, in which the Council realises that it will not be possible to provide a comprehensive overview here. By the way, it is not always the rules themselves that prove inhibitive; the manner in which they are interpreted is of relevance too. In that respect, Bastein et al. (2013) point out that circular leaders experience limited room for innovation due to a risk-avoiding interpretation of rules by the competent authorities.

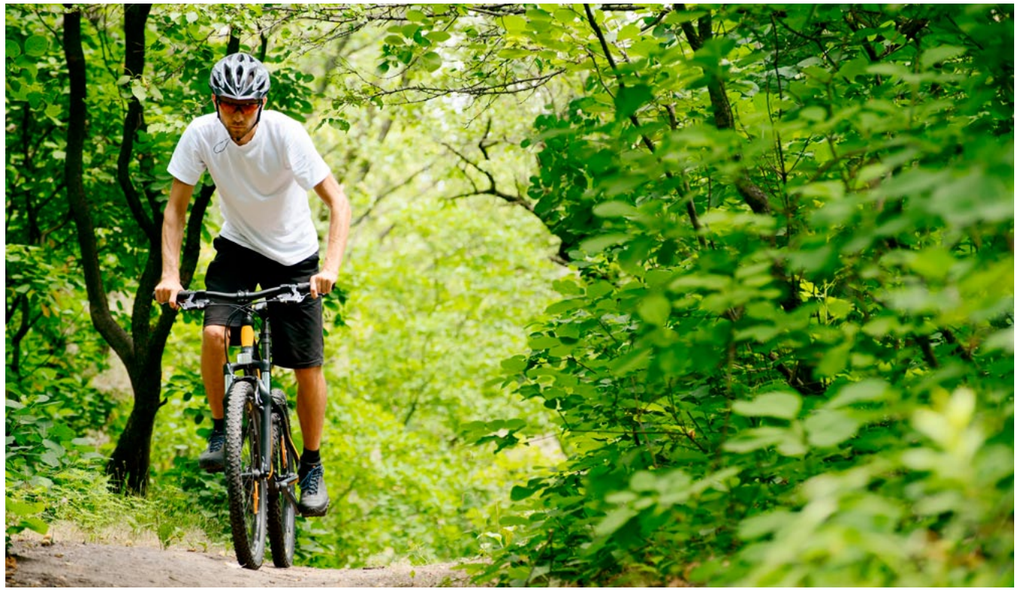
European and national competition policy

In a circular economy, companies will sometimes cooperate very intensively, for example in terms of using each other's residual flows. Intensive cooperation within product chains might however be qualified as cartel forming or the abuse of dominant positions. Under the applicable Dutch and European legislation aimed at protecting consumer interests, such intensive cooperation is therefore often not permitted (Circle Economy & IMSA, 2013, p. 41).

Legally speaking, waste is not a resource

According to the law, waste is not a product, not a resource. This is understandable from the standpoint of protecting the environment and public health. Legally, this however actually makes it more difficult to organise aspects which actually become more important in a circular economy, for example regarding collection, cross-border transport (OPAi & MVO Nederland, 2014; Bastein et al., 2013). The legislation in this area however is already in motion: for example, European waste legislation does allow member states to establish criteria at the national level (provided no European criteria are in place and provided that certain conditions are met) under which a waste material may be considered a raw material. In the

Netherlands, this recently happened for recycled aggregates from construction and demolition waste.



Relatively high taxes on labour

In the current tax system, labour is taxed relatively heavily, more heavily than materials and raw materials. Several studies point out that this negatively impacts the transition to a circular economy (Circle Economy & IMSA, 2013, p. 41; Rathenau, 2014). This actually supports the principles of the linear economy and in fact often makes the repair or sorting of collected waste products expensive and the purchase of a completely new product relatively cheap. In a circular economy, this should be just the other way around.

Property-based legal frameworks

Current legal frameworks have been drawn up with the linear economy in mind. The concept of leasing, for instance, still has legal ambiguities regarding ownership (OPAi & MVO Nederland, 2014). For example, what happens to a washing machine if the user can no longer afford to pay the lease fee? Or what happens if the company goes bankrupt; who will assume responsibility for repairing the device or removing it after it has reached its end-of-life?

Financial frameworks

In general, the prevailing financial frameworks were still drawn up for the linear economy. For example, current purchasing or rental rules insufficiently take into account the performance based contracting of products (everything is amortised to a residual value of zero, without taking into account the value of the remaining materials in the product). Accounting rules too were drawn up based on the principles of the linear economy (OPAi & MVO Nederland, 2014).

European Waste Shipment Regulation (EWSR)

This directive regulates the cross-border transport of waste materials: into, out of and within Europe. In the discussion on the circular economy, this directive is cited as a barrier to the international trade of valuable secondary raw materials. Apart from the high administrative burden for companies, which might result in companies not offering flows up for

recycling, this directive has also been the subject of criticism due to differences in interpretation and enforcement in the various European countries. These differences result in an unlevel playing field: the Netherlands for instance is allegedly more stringent in this respect.
In a letter to parliament, the State Secretary for Infrastructure and the Environment has stated that the Netherlands, in its capacity as a major transit country for waste, is being negatively impacted by the insufficient enforcement of the European Waste Shipment Regulation in other member states and by the fact that the so-called 'green list', which lists waste materials that are governed by a relatively lighter regime, is interpreted differently from country to country. In addition to better enforcement, the Netherlands therefore strives for a more optimum way to deal with differences in interpretation (Tweede Kamer, 2013d) and has established a 'support point EWSR' to further explain matters related to the enforcement of and decisions on EWSR (Tweede Kamer, 2015c).

3.3 Economic barriers

For the transition to a circular economy, good economic earning potential is crucial to companies. Is it profitable to operate circularly? At present, this is not always the case; it is partially for this reason that some circular initiatives of companies are not successful. Possible barriers include:

Low prices of primary raw materials
Low prices of primary raw materials make it less profitable for companies to start working with secondary materials (recycled materials) or to provide a product which (by design) can be more easily repaired, reused or disassembled after use. As long as the price of recycled materials is higher than that of primary raw materials, the transition to a circular economy may be impeded (Circle Economy & IMSA, 2013). When the price of primary raw materials goes up, the economic earning potential of a circular business approach increases.

External costs are not included in the costs (true price)
The true price (see glossary) involves the actual allocation of costs to materials and products, including the social and environmental costs. This means external costs are monetised. If non-renewable resources are given a true price – so one which also includes the ecological and social costs – these costs are likely to be passed on in all links of the chain. This will probably make it more rewarding for companies to start operating in a circular fashion. That external costs (environmental, social) are not yet incorporated in the total costs can impede the transition towards a circular economy (Circle Economy & IMSA, 2013; Rathenau Instituut, 2014).

Limited application of alternative business models
Companies that adapt to the principles of a circular economy will expectedly need alternative business models with business processes that have been set up in a different way. Current business models are usually based on the selling of products. In alternative, circular-based business models, the focus is often more on the usage of services rather than the

ownership of products. Reuse, repair and recycling play a central role. The limited application of new business models may impede a transition towards a circular economy (Circle Economy & IMSA, 2013).

Substantial investments in advance

Operating according to the principles of a circular economy can require relatively high investments in the short term, while the yields do not become apparent until the longer term. These substantial investments beforehand can impede the transition towards a circular economy (Circle Economy & IMSA, 2013). The fact that in many cases costs and benefits are currently still unevenly distributed across the chain contributes to this. The profit margins for retailers for example are many times higher than those for transport companies, among other things due to the fact that power is unevenly distributed among players in material and product chains (Bastein et al., 2013). As a result, one party has a greater margin to make circular (pre)investments than another. In tendering procedures, the clients do not yet always take into account the high investments that are required beforehand. This means that tendering procedures need to be adjusted (Rli, 2013; OPAi & MVO Nederland, 2014). Through the Green Deal Circular Procurement, the State is trying to gain experience in this.

Increasing complexity in business processes

Several studies suggest that gearing the operational management towards circularity is a complex matter which can also have an impact on the economic earning potential. Managing many contracts (for example when leasing services) is different from supplying products and consequently requires a different operational approach (OPAi & MVO Nederland, 2014). Also, parties may start operating in circular fashion at different paces: a company that wants to start working circularly may be dependent on other (supplying) companies and the pace at which these start operating circularly. That complicates matters. Procurement and sourcing conform the starting points of a circular economy can also prove difficult for a company: other risks are involved, longer product lifespans with longer contracts, a more integrated approach to the costs of life cycles when determining the price (OPAi & MVO Nederland, 2014; Bastein et al., 2013). The existing business processes and cycles must be geared to circular principles: most business plans now still assume three to five years with short cycles (fiscal years, quarterly budgets), while the cycles of a circular economy often span longer periods of time (OPAi & MVO Nederland, 2014). It is expected that the higher costs of management and planning may impede the transition to a circular economy (Circle Economy & IMSA, 2013).

3.4 Social barriers

Generally speaking, gaining public acceptance for the principles of a circular economy constitutes an important condition to achieve this transition. Possible social barriers are:

Lack of awareness, knowledge and sense of urgency

Among consumers, there may be a lack of awareness or an insufficient

sense of urgency for a shift towards a circular economy and circular actions (Circle Economy & IMSA, 2013; Bastein et al., 2013). If consumers are not aware of their actions, then they are also less likely to change their behaviour (De Groot & Steg, 2010). As consumers become more aware of their behaviour, the behavioural changes (Witte, 1992) and willingness to act (Kuhl, 1982) increase. Furthermore, consumers may feel that the contribution an individual can offer in terms of sustainability is far smaller than that of the business community or the government. Moreover, people love convenience (Bastein et al., 2013; Rli, 2014a). In addition to this, sufficient knowledge is not always available to make the right choices: people are sometimes unaware of what is expected of them (for example in the case of waste collection) or what value waste may have (waste is something which they need to dispose of rather than something they need to preserve as a resource because it holds value) (Bastein et al., 2013). People are more likely to act circularly when they think that people who are important to them expect them to do so (Harland et al., 1999). Furthermore, people are more inclined to act circularly when they see others doing this. The reverse also holds true: if others don't do something, people are more likely to not do something as well (Keizer et al., 2011).

The value of property

At present, property, material consumption and the values associated with these are deeply embedded in society. Property is part of the self-consciousness of people. Property is often status-related and the susceptibility of people to fashion and trends may cause consumers to

make choices that are less optimal from a circular perspective (Circle Economy & IMSA, 2013; OPAi & MVO Nederland, 2014; Bastein et al., 2013). Also, ownership may be associated with 'doing the right thing' (and thus making people feel good about themselves), such as the passing on of property in an estate. The message of a circular economy may come across as 'what you have is only temporarily yours' (OPAi & MVO Nederland, 2014), thus not conveying the same values as are currently associated with property. Furthermore, it is often more difficult for consumers to think in terms of functionality rather than products, and especially this is necessary when products are rented or leased (OPAi & MVO Nederland, 2014). Related to this is the fact that consumers have a preference for 'new' instead of 'used, recycled, second-hand': new is 'still the best'. Used products are often considered more or less inferior. This perception by the way is not just restricted to consumers: even companies may have a perception of inferiority when it comes to second-hand products (OPAi & MVO Nederland, 2014).

3.5 Limitations to knowledge and innovation

The transition to a circular economy requires knowledge development, knowledge dissemination and innovation. If these elements are insufficiently present, this may impede the transition.

In general, a fragmented organisation of knowledge development and very limited cross-sectoral knowledge development are present with respect to the issue of circular economy. Since the circular economy actually relates to various sectors, this kind of knowledge organisation is not effective. Structural cooperation in this field between companies, knowledge institutes and government bodies is not guaranteed, and with that the question arises as to how knowledge development can be organised and how acquired knowledge can be properly brought to the market (Bastein et al., 2013). In addition to a lack of knowledge, there is also a suboptimal dissemination of knowledge among companies. A lack of trust between companies and the confidential nature of information limit the exchange of information and, with that, the transparency (Bastein et al., 2013; Circle Economy & IMSA, 2013; OPAi & MVO Nederland, 2014). Despite the growing interest and the strong starting position of the Netherlands in the field of design, knowledge development related to circular design and eco-design is still in its infancy. What is the best design when taking into account the whole chain, including the end-of-life phase (Bastein et al., 2013)? In addition, a coherent approach to education and the development of a number of skills and competences is lacking (Bastein et al., 2013).

Specifically in terms of technology, the processing of recycled materials constantly poses new challenges to the business sector. A flow of information is needed for all parties that contains reliable information on, for example, material composition and toxicity. Knowledge development in this area remains necessary for a transition to a circular economy. To date, linear technologies however still prove to be too deeply entrenched (Circle Economy & IMSA, 2013).

APPENDIXES

A. OVERVIEW POLICY GOALS

Policy paper/ agreement framework	Main goals	Parties involved
Green Growth (Tweede Kamer, 2013a)	• Energy: towards a sustainable, affordable and reliable energy provision • Biobased economy: towards substitution of fossil fuels by renewable resources (biomass) • Climate: towards an ambitious (inter) national climate policy • Waste: from waste to resource • Construction: towards the construction of energy-efficient buildings • Food: towards sustainable agriculture and food supply • Mobility: towards sustainable transport methods and transport • Water: sustainably working with water	EZ, I&M
Raw Materials Memorandum (Tweede Kamer, 2011b & 2013c)	• Secure, enhance and increase sustainability of supply or raw materials • Limit demand for resources and where possible increase sustainability • More efficient and sustainable use of raw materials	EZ

Policy paper/ agreement framework	Main goals	Parties involved
VANG (From Waste to Resource Programme) (Tweede Kamer, 2014)	• Remove barriers standing in the way of circular production processes and the reuse of waste products • Visibly reduce the amount of materials that leaves the economy by 10 million tonnes to 5 million tonnes in 2022 • Better separation of waste: 75% by 2020 and 100% by 2025; 100 kg waste/inhabitant/year in 2020 • Utilisation of economic opportunities presented by circular economy: Netherlands hotspot of circular economy in 2020	I&M
National Waste Management Plan (LAP) (Tweede Kamer, 2009)	• Stimulation of waste prevention, so that the total waste production does not exceed 68 megatons in 2015 and 74 megatons in 2021 • Increase the useful utilisation of the total supply of waste materials from 83% in 2006 to 95% in 2015. Of the 95% which is usefully utilised, at least 83%-point needs to be generated through recycling (in 2006 this was 76%-point) • Increase the useful utilisation of all household waste from 51% in 2006 to 99% in 2015. Of the 99% which is usefully utilised, at least 60%-point needs to be generated through recycling (in 2006 this was 47%-point) • Increase the useful utilisation of the total amount of HDO waste from 46% in 2006 to 95% in 2015. Of this 95%, at least 60%-point should be generated through recycling (in 2006 this was 48%-point) • At least keep equal the rate of 95% of usefully utilised construction and demolition waste that was already achieved in the Netherlands in 2006, despite the expected sharp increase in the production of this waste stream in the coming years (from 23 megatons in 2006 to 31 megatons by 2021) • At least keep equal the useful utilisation rate of 90% for industrial waste that was already achieved in the Netherlands in 2006, despite the expected increase in the production of this waste stream from 16 megatons in 2006 to 18 megatons by 2021. Of this 90%, at least 85%-point should be generated through recycling • Reduce the dumping of combustible residual waste in landfills from 1.7 megatons in 2007 to 0 megatons in 2012. Except for a very small number of specific and difficult flows, this aim has been achieved and needs to be maintained for the duration of the planning period • Reduce (indicative objective) the environmental pressure for each of the seven priority flows which are being targeted in the context of chain-oriented waste policy by 20 percent in 2015 • Optimally utilise the energy content of waste that cannot be recycled • Make better use of the residual heat from waste incineration • Realise a European level playing field for waste management • Flesh out the special responsibility of the government for dumping • Use the cradle-to-cradle (C2C) concept as a source of inspiration in the seven priority streams which are being targeted in the context of chain-oriented waste policy	I&M

	• Contribute to the government ambitions for 'Green Growth' in general and the programme 'From Waste to Resource' and the realisation of the circular economy in particular. This among other things means the promotion of - efficient use of raw materials (resource efficiency) - smart product design (eco-design and substitution of non-sustainable materials) - use objects for longer and more than once (reuse and repair), and optimal utilisation of residual flows	
Energy Agreement (SER, 2013)	• Savings in final energy consumption by an average of 1.5% per year • 100 petajoules of energy reduction in the final energy consumption of the Netherlands in 2020 • Increase the share of renewable energy generation (now more than 4%) to 14% in 2020 • Further increase this share to 16% in 2023 • At least 15,000 full-time jobs, a large percentage of which to be created in the next few years	forty organisations, including employers' and employees' organisations, environmental and nature organisations, social organisations, financial institutions
Climate Policy (Tweede Kamer, 2013e)	• In an EU context, advocate 40% CO_2 reduction by 2030 compared to 1990	I&M
Natural Capital Agenda (Tweede Kamer, 2013b)	• Sustainable production and consumption: sustainable chains • Sustainable fishery and protection of marine biodiversity • Sustainable agriculture and protection of biodiversity • Valuing of natural capital	EZ and I&M
Dutch Technology Pact (Techniekpact, 2013)	Agreements to train sufficient people to work in the technological sector	Educational institutions, employers, employees, young people, top sectors, regions and State
Treaty for sustainability in education (Groene Generatie NL, 2014)	Treaty which calls for the inclusion of sustainability in education	Youth organisations and political parties

B. OVERVIEW OF REPORTS ON EMPLOYMENT EFFECTS

Several reports have been published on the effects a circular economy may possibly have on employment. The table below shows how much employment a number of these reports expect in the future as a result of a circular economy.

Report	Scope	Method	Gross employment growth	Net employment growth	Sectors/Rs in which growth is expected
TNO (Bastein et al.), 2013	Metal electro sector in the Netherlands	First, the increase in market value was calculated. Next, based on the share of labour in the various sectors, the increase in employment was calculated.		Circular economy yields 10,583 jobs in the longer term[21] (figure was corrected for reduction due to fewer sales of new products).	Repair, reuse, recycle.
	Netherlands	The report makes statements about employment in the Netherlands on the basis of one detailed case study (extrapolation). Estimates are on the conservative side.		54,000 jobs in the long term (after 2020).	Especially manufacturing sector[22], but also services sector and agriculture. Indirect benefits of circular economy[23] include: New impulse for the manufacturing industry and the recycling industry, innovation in logistics industry and development of new economic activities.

21 TNO uses three terms: short-term (0-3 years); medium-term (3-7 years); longer term (> 7 years, after 2020).
22 By 'manufacturing sector', the following is meant here: textiles and clothing, wood and paper industry, automobile industry, printing industry, building materials industry.
23 The report mentions a number of indirect benefits of a circular economy the value of which has not been further analysed in the report.

Report	Scope	Method	Gross employment growth	Net employment growth	Sectors/Rs in which growth is expected
European Environmental Bureau, 2014	Europe	Three scenarios: 1. modest 2. average 3. ambitious (more than 70% recycling and intensive reuse) Method: extrapolating trend current employment in recycling and reuse.[24]		Net job growth[25] until 2025: scenario 1: 634,769 scenario 2: 713,525 scenario 3: 747,829	More recycling and more/ intensive reuse
WRAP & Green Alliance, 2015	England	Based on[26] current trends via three scenarios[27]: 1. no new (circular) initiatives 2. current trend will continue 3. transformation The report assumes that circular activities are more labour intensive than the activities they replace.	'Gross' job growth until 2030[28]: 1. 31,000 2. 205,000 3. 517,000	Net' job growth until 2030: 1. 10,000 2. 54,000 3. 102,000	Re-use, recycling[29], repair & remanufacturing, servitisation (renting and leasing), biorefining.

24 The report is based on existing data and literature (including Friends of the Earth Europe, 2010, for employment figures recycling) and the input of stakeholders from the industry and NGOs. Where limited data were available, estimates have proven to be on the conservative side and it is indicated where no data were available.

25 This report refers to 'additional jobs', 'net new jobs'. Whether real growth in terms of employment and/or the displacement of existing jobs has been taken into account is not elaborated; as 'net new jobs' are mentioned, the column 'net employment growth' has been selected.

26 Based on existing data and literature supplemented by, among other things, input from experts. This report is based on conservative estimates. The report indicates that figures are illustrative rather than 'definitive'.

27 The difference between the scenarios relates to the difference in recycling percentages (at 1, everything stays the same, so 55%; scenario 2 is the 70%-scenario, scenario 3 the 85%-scenario), remanufacturing rate (1% - 20% - 50%) and for reuse, servitisation and biorefining figures vary from slight growth (scenario 1) to significant growth (scenario 3).

28 This report mentions 'gross jobs growth', which refers to the growth in jobs in 'circular' sectors; and 'net job creation', which refers to the total growth in employment and reduction in unemployment, taking into account the displacement of existing jobs.

29 The report speaks of 'closed-loop' and 'open-loop' recycling. Closed-loop recycling means that waste is used to make new products without changing the characteristics (inherent properties) of the material. For example, the recycling of PET bottles. With 'open-loop recycling', 'downcycling' is meant.

Report	Scope	Method	Gross employment growth	Net employment growth	Sectors/Rs in which growth is expected
EPEA Internationale Umweltforschung GmbH, 2014	Luxembourg	Rough estimate of the effects of increasing circularity in Luxembourg for a number of sectors (according to the report, 'sectors with high inherent connection/overlay with circular activities'). Based on expert opinion about the potential growth of these sectors through circularity.		More than 2200 jobs in three years (until 2017)[30] if circular economy can be 'accelerated'[31].	Construction, automotive, manufacturing, financial, logistics, R&D, administrative sectors (especially labour-intensive industry, manufacturing and construction). Some activities mentioned are: redesign, recycling, reverse logistics, reverse supply chain management, redistribution, repair.
Club of Rome, 2015	Sweden	Employment effects[32] calculated[33] for four strategies to boost resource efficiency: 1. increase energy efficiency by 25% 2. halve use of fossil fuels 3. materials efficiency[34] 4. all three of the strategies		1. 20,000 jobs, employment growth of 0.5% 2. 5,000 jobs; 0.1%[35] growth 3. 50,000 jobs; 1-2% growth[36] 4. 100,000 jobs; 2-3%; reduction unemployment by quarter to half	Repair, maintenance, upgrading of products and remanufacturing.

30 The report indicates that an 'order of magnitude' is involved. The point is that circular economy can achieve a significant growth in employment.
31 In the report, the following is stated about this: "For example, a precondition is that the Ministry as well as frontrunner companies and R&D institutes in Luxembourg adopt circularity as a development approach, and implement circularity education, training, supplier communities and other enabling tools in order to capture savings and realise added value."
32 Concrete targets have been set here that could be achieved by 2030.
33 Figures are based on a combination of the model-based manipulation of supply chains (in favor of renewable and secondary materials) and at the same time the anticipation of a significant higher level of resource efficiency in the economy. The main analytical tool is an input/output model for the Swedish economy, administered by the Swedish Statistical Office, which takes into account the interdependencies of various branches of a national economy.
34 By increasing prosperity, minimising waste and maximising the reuse and recycling of materials. This leads to an increase in material efficiency of 25%, half of the primary raw materials are replaced by secondary/recycled materials, a doubling of the lifespan of long-lived consumer products.
35 For strategy 1 and 2, the growth is partially temporary (a few decades): during the time that the necessary investments in the adjustment of old buildings and other efficiency improvements are performed.
36 These are permanent jobs ensuing from the impact of the changes in the relationship between goods and services in the economy.

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GLOSSARY

Biobased economy An economy in which 'green' (renewable) resources are used instead of fossil fuels.

Biological loop The circular system has two loops of materials: a technological loop and a biological loop. In a biological loop, residual flows safely return back to nature. Also see technological loop.

Cascading Process which takes place in steps or, as it were, along the rungs of a ladder.

Chain The production process of goods using raw materials, production, semi-finished products, production, finished products, users.

Circular economy The circular economy is an economic and industrial system that takes the reusability of products and raw materials and the resilience of natural resources as a starting point, minimises value destruction throughout the entire system and aims for the creation of value at every stage of the system.

Circular hotspot Country or region that is in the forefront of the circular economy.

Circular hub Transition point or physical hub for the circular economy.

Collaborative economy An economy based on the connecting of people through digital media, resulting in the more optimum use of products, services and other important factors.

Cradle-to-cradle Sustainability concept in which waste is no longer seen as waste, but as resource for new products. The term was first developed in the book 'Cradle to Cradle: Remaking the Way We Make Things' from 2002 by William McDonough and Michael Braungart.

Critical materials These are scarce materials which are essential to certain industries and for which the security of supply is low.

Dematerialisation Through digitalisation and through products that combine multiple functions (think of the smartphone, which replaces the telephone, alarm clock, MP3 player, camera, flashlight, navigation system, calculator, etc.) fewer products are needed.

Eco-design Designing products with a minimal environmental impact in mind throughout all stages of the life cycle, for example because products can be easily disassembled and reused again.

Eco-effectiveness Creating the highest possible functionality per unit of raw material.

Eco-efficiency Preventing the use of raw materials as much as possible; use as little raw materials per product as possible.

Eco-industry Heterogeneously composed industry that produces goods and services that counteract the deterioration of the environment and conserve natural resources.

Economy with feedback loops Recycling economy.

Environmental impact The extent to which the environment is affected by the activities of man.

Environmental pressure The pressure that man exerts on the environment through production and consumption.

Green Deal Cooperation between the central government and initiating parties to help launch sustainable initiatives. The State can help by reducing regulatory burdens, deploying its network and procurement and sourcing powers or sharing knowledge. The implementation lies with the initiating party. Cost-effectiveness and swift results are requirements.

Industrial symbiosis Residual products and by-products from one company are used as resources for another company.

Launching customer Large customer which through procurement and sourcing policy contributes to the creation of markets for innovative products, services or processes. With that, the party serves as an example to other parties, thus urging them to buy the product or service.

Level playing field Legal boundary within which economic operators are treated equally; they have equal access to markets and must comply with the same rules.

Linear economy Economy in which new raw materials are extracted and converted into products that are destroyed at the end of their life cycle ('take, make, waste').

Lock-in The prevention of a change in processes due to investments that have not yet been recovered.

Logistics The integrated planning, organisation, management, handling and control of equipment and goods and associated information throughout the entire chain - from raw material to finished product in the hands of the user.

Market articulation Not supply-driven but demand-driven (demand pull).

Market failure Failed interaction between supply and demand.

Metabolism of an area The entirety of flows that enter and leave an area and ensure that the area can continue to function (by analogy with the metabolism of man), such as waste flows, biomass and food, water, construction flows.

Natural resources See Resources.

Nearsourcing The strategic positioning by companies of business activities close to the location where the finished products are sold.

Non-renewable resources Raw materials which are finite, meaning present in limited quantities in and on the Earth. For example oil, gas, metal ore, coal.

Planetary boundaries The limits within which humanity must navigate in order to make sustainable use of the resources of the earth.

Primary raw materials Raw materials which have not previously been used, processed or consumed that serve as the basis for production.

Recyclate See secondary raw materials.

Raw material dependence The degree to which raw materials are imported from other countries.

Renewable resources Materials which are used in manufacturing and which in theory cannot be depleted (such as wood, agricultural crops, wool).

Resource efficiency See eco-efficiency.

Resource management The process in which the management of raw materials plays a central role, as opposed to waste management which focuses on the management of waste.

Resources All naturally occurring substances that may be of economic benefit and that are indispensable to the quality of life of humans.

Security of supply Security of supply relates to the degree of certainty that exists regarding the availability of resources now and in the future.

Secondary raw materials Reclaimed, reusable raw materials; materials which have been generated from previously used raw materials.

Supply chain A chain of activities aimed at getting a product or service from supplier to consumer. These activities include the transformation of resources and components - possibly through intermediate stages - into an end product that is delivered to the end user. In practice, a supply chain consists of a number of companies that supply each other and, ultimately, the consumer.

Technological loop The circular system has two loops of materials: a technological loop and a biological loop. In a technological loop, product (parts) have been designed and marketed with high-level reuse in mind. As a result, the economic value is retained as much as possible. Also see biological loop.

Top Sectors The nine top sectors are: high-tech systems and materials, energy, creative industry, logistics, agro & food, horticulture and propagating stock, life sciences & health, water and chemicals. The top sectors were deemed essential to the competitiveness of the Netherlands by the Rutte I government.

Transition Structural change process that takes place over a longer period (one or two generations) of time, is complex and involves various uncertainties.

True price/true pricing The external costs are included in the price of the product. External costs arise when someone's individual actions affect the well-being of another party in a manner which, according to the existing definitions of ownership in society, does not require payment.

Upcycling The opposite of downcycling. With upcycling, the quality of the material/product increases as a result of recycling.

Urban mining The recovery of resources from products, buildings and waste.

Value creation Value creation occurs when more value is added. This can occur in three areas: economic, social and environmental.

Value destruction Value destruction occurs if value disappears after a product has been discarded.

Value retention Value retention occurs when a product is worth at least as much as it was prior to having been discarded.

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2015

Fundamental Reform of Environmental and Planning Legislation ['Stelselherziening omgevingsrecht']. May 2015 (RIi 2015/02)

Survey of Technological Innovations in the Living Environment ['Verkenning technologische innovaties in de leefomgeving']. January 2015 (RIi 2015/01)

2014

Managing Surplus Government Real Estate: Balancing public interest and financial gain ['Vrijkomend Rijksvastgoed: over maatschappelijke doelen en geld']. December 2014 (RIi 2014/07)

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2013

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Nature’s Imperative: Towards a robust nature policy [‘Onbeperkt houdbaar: naar een robuust natuurbeleid’]. May 2013 (RIi 2013/02)

Room for Sustainable Agriculture [‘Ruimte voor duurzame landbouw’]. March 2013 (RIi 2013/01)

2012

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