PBL Netherlands Environmental Assessment Agency

POTENTIAL EFFECTS OF CIRCULAR ECONOMY POLICIES IN THE EU AND THE NETHERLANDS ON DEVELOPING COUNTRIES

Workshop report

Paul Lucas, Tom Kram and Aldert Hanemaaijer

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Potential effects of circular economy policies in the EU and the Netherlands on developing countries

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Corresponding author
paul.lucas@pbl.nl

Authors
Paul Lucas, Tom Kram and Aldert Hanemaaijer

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Preface

This report reflects the outcomes of a workshop hosted by PBL Netherlands Environmental Assessment Agency on 'Effects of a circular economy in the EU and the Netherlands on developing countries' on 17 May 2016, in The Hague. We would like to thank the workshop's participants for their valuable contribution.

Contents

Main findings

1. Pursuing a circular economy in the EU and the Netherlands can have both positive and negative social, economic and environmental effects on developing countries. Both the direction and magnitude of potential effects are highly context-specific. The effects differ per product group and per step in the circular economy and depend on a product's economic and ecological value.
2. Assessment of potential effects of circular economy policies in the EU and the Netherlands on developing countries requires a system-wide approach, including the entire supply chain and all stakeholders. Furthermore, scenario analysis is required to take future social, economic and environmental developments and their interlinkages into account.
3. Ensuring policy coherence and policy synergies requires applying an impact assessment from the moment new policies are proposed. Furthermore, investing in green growth policies and legislation as well as enforcement in developing countries, such as those related to recycling, can help developing countries anticipate on potential negative effects.
4. Clear insights into the potential effects of specific policies require a research agenda. Among others, such an agenda would need to include the following themes: the size of potential rebound effects, lessons learned from existing processes, the conditions under which positive effects for developing countries may occur, and scenario development to think through the various effects.

1 Introduction

In recent years, the circular economy has gained policy momentum, both in the European Union and in the Netherlands (see Box 1). In the EU with *Closing the Loop* (EC, 2015). In the Netherlands with the *Waste to Resource* programme (IenM, 2014a, b) and the recently launched *Government-wide programme for a Circular Economy* (IenM and EZ, 2016). The circular economy can provide economic opportunities, contribute to a clean environment and make countries less dependent on domestic and imported scarce natural resources. A successful transition requires actions throughout the whole supply chain: from the extraction of raw materials to product design, to manufacturing, usage, repair, reuse and, finally, recycling (PBL, 2016a, b). As such, a transition to a circular economy in the EU or in Netherlands can also affect developing countries that are connected through this supply chain.

Recognising there could well be issues with existing and emerging policy goals and ambitions, policy coherence requires attention in the development of circular economy strategies in order to minimise contradictions and build synergies to benefit developing countries and increase the effectiveness of development cooperation.[1] Policy coherence and elements of the circular economy are also part of the Sustainable Development Goals (SDGs), the new global sustainable development agenda for 2030 (UN, 2015). The interlinkages and integrated nature of the SDGs accentuate synergies and hint at trade-offs between different themes and sectors, different actors (such as governments, business and NGOs) and different scales (subnational, national, regional (e.g. EU) and international) (Lucas et al., 2016). However, current knowledge on these interlinkages and, especially, the potential effects of circular economy policies on developing countries is scarce, and is not addressed in the EU action plan on the circular economy *Closing the Loop*, in the Dutch *Waste to Resource* programme.

In that context, the Dutch Ministry of Foreign Affairs has requested PBL Netherlands Environmental Assessment Agency to provide insights into the potential effects of circular economy policies in the EU and the Netherlands on developing countries. This question was addressed in a workshop with Dutch experts in the field of circular economy and development cooperation, held on 17 May 2016 (see Appendix A for a list of participants). The workshop participants discussed the main (positive and negative) effects of circular economy policies on developing countries, for different steps in the circular economy and different material flows (electronics and rare earth metals, biomass and food, and plastic, paper and textiles). The main outcomes of the workshop have been captured in the *Government-wide programme for a Circular Economy*. This reports reflects the outcomes of that workshop. Because of the short time frame, a literature study was beyond the scope of the report.

[1] Through Policy Coherence for Development (PCD), the EU seeks to take development objectives into account in all of its policies that are likely to affect developing countries.

Box 1: Circular economy in the EU and the Netherlands

A circular economy is increasingly seen as an opportunity for companies and new business models (EMF, 2015). In policy-making, a circular economy is seen as 'a positive, solutions-based perspective for achieving economic development within increasing environmental constraints' (EEA, 2016).

In European policy-making, circular economy is mentioned in the *7th Environment Action Programme* (EU, 2013) and in December 2015, the European Commission published 'Closing the loop — An EU action plan for the circular economy' (EC, 2015). In this action plan, the European Commission expresses the need for a circular economy as follows: 'The transition to a more circular economy, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised, is an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy. Such transition is the opportunity to transform our economy and generate new and sustainable competitive advantages for Europe'. The action plan is the EU strategy that aims to support the transition towards a circular economy. It proposes measures covering the whole cycle, combined with concrete targets for waste.

The Dutch *Waste to Resource* programme is the Dutch Cabinet's way of stimulating key elements of the transition towards a circular economy, by elaborating eight operational objectives along the value chain (IenM, 2014a, b). These objectives include promoting sustainability at the front end of the chain, making consumption patterns more sustainable, improving waste separation and collection, focusing existing waste policy on a circular economy, adopting an approach to specific material chains and waste flows, developing financial and other market incentives, connecting knowledge and education to the circular economy and simplifying measurement methods, indicators and certification labels.

2 Potential effects in context

Pursuing a circular economy in the EU and the Netherlands can have economic, social and environmental effects in developing countries. However, both the direction and magnitude of these effects are highly context-specific.

2.1 Effects differ per product group

The effect of circular economy policies on developing countries, is partly determined by whether a product is produced and/or treated as waste nationally or internationally. Local use of available resources (such as municipal or construction waste and secondary building materials) or companies using each other's residues (industrial symbiosis) are not likely to have a direct effect on developing countries. In addition, it matters whether a product is biotic, such as biomass and food, or a-biotic, such as electronics, metals and materials. Realising circular biomass or circular food systems requires different measures than, for example, realising a circular economy in the electronics sector.

Optimal management and use of resources, as well as optimal use of food and most waste flows, are prerequisites for a circular food system (Rood et al., 2016). The resources that are needed for producing renewable raw materials include not only fertile soils, water and biodiversity, but also minerals. Poor resource management can lead to depletion, pollution and degradation of this resource base.

Electronics are produced in global production chains with raw materials and components from all over the world. Circular economy policies for this product group focus on resource efficiency of materials and energy and security of supply of rare earth and other metals. They can, thus, directly affect developing countries that rely heavily on the export of these resources (De Jong et al., 2016).

2.2 Effects differ per step in the circular economy

The effect of a specific policy on developing countries depends on which step in the circular economy the policy targets (see Figure 1). Generally, three steps can be distinguished:

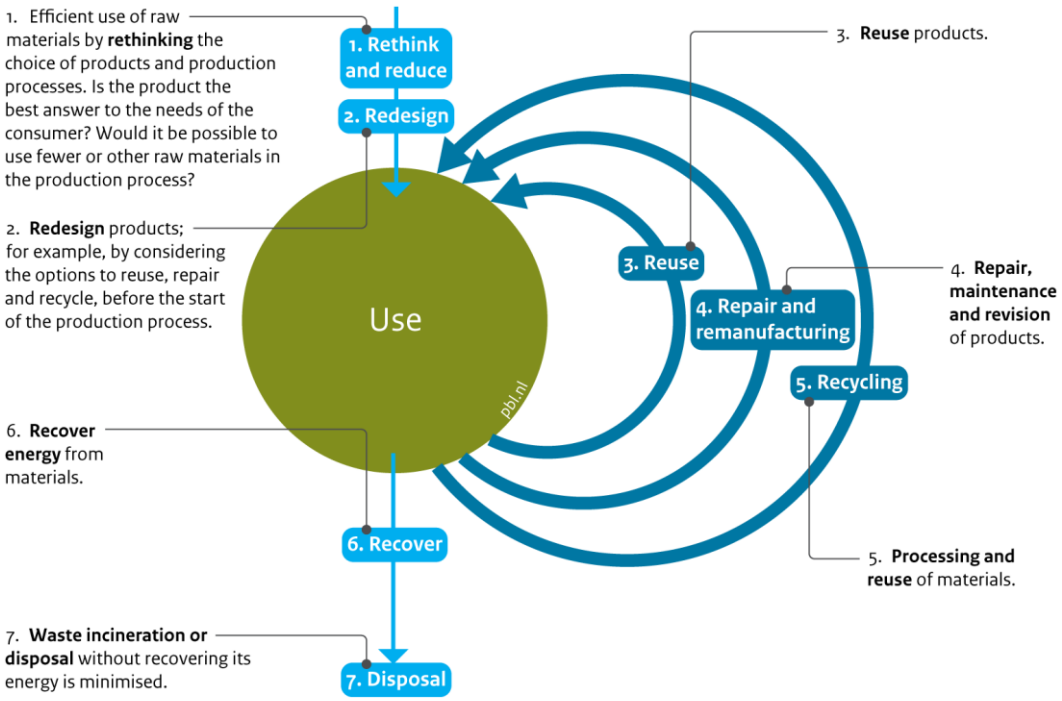
1) Using and developing smarter products (rethink, reduce, redesign)
2) Extending the lifetime of products (reuse, repair and remanufacturing)
3) Recycling and recovery of energy and materials

Rethink, reduce and redesign are all about using fewer inputs for creating the same product. With regard to electronics, this is about using fewer metals and materials, thereby reducing their imports. For food, it is about preventing waste, as much as possible. Furthermore, it is about increasing yields and using water and nutrients more efficiently, thereby decreasing environmental pressures. It should be noted that the EU and the Netherlands are not the only players on the international resource market (De Jong et al., 2016). Future growth in resource use is expected to come primarily from developing and emerging economies.

Reuse, repair and remanufacturing are all about extending the lifetime of specific products. Of course, this reduces their production level and, thus, also the import of the required resources, such as certain metals and materials. However, also important is the location where the lifetime of the product is extended, i.e. within the EU or in developing countries. For food, it is important to give priority to high value use for the many waste flows which occur throughout the production chain (cascading). This concretely means material use (f.i. feed for animals) before incineration for energy production, since the latter implies the raw materials will be lost.

Figure 1

The circular economy



Source: PBL

Finally, recycling and recovery are both about processing and reusing energy and materials. Again, this reduces the import of materials. In food production, this step is about closing mineral cycles, while, for electronics, it is about recovering specific components and metals for reuse. For electronics, the effects on developing countries largely depend on where the recycling takes place, i.e. in the EU or in developing countries. There are already some installations in the EU for the high value and large-scale recycling of rare earth metals from electronic waste. However, many electronic products are still exported to developing countries, to be reused and recycled there. Such recycling is often realised through manual and cheap labour, potentially under poor labour conditions and with negative impacts on the local environment and people's health.

For all steps, there is an important distinction between policies targeting existing products (those not specifically designed with a circular economy in mind) and those concerning newly designed products that already use less fewer inputs in their production process, have a longer lifetime, are easier to repair, and are more suitable for recycling. For biotic products, recycling is not an option, but cascading is, as that would reduce the demand for primary inputs. In addition, elements embedded in biotic resources, such as metals and other minerals, can be recovered from the waste streams. For example, the recovery of phosphorus from animal and human waste.

2.3 Effects depend on a product's economic and ecological value

Finally, the effects that circular economy policies can have on developing countries depend on a product's economic and ecological value and on how such policies would change that value.

All steps to reduce the demand for resources also reduce resource imports from developing countries. As a result, prices of internationally traded products may drop, with consequences for both exporting and importing developing countries. Lower prices could induce an increase in demand (the so-called rebound effect), thereby partly reducing the effects on exporting countries. For reuse and repair, import reductions largely depend on the added amount of time the product spends in the economy, while, for recycling, the recovery rate is important. Reduced exports may impact jobs and incomes that are related to raw-mineral extraction or to the processing and selling of waste and second-hand products. Reduced exports may have a positive impact on the environment, as the extraction of raw materials requires large amounts of energy and could be associated with major negative impacts on local landscapes.

Higher product standards, for both production and use, may have a positive impact on social conditions, income levels and the environment, in sectors such as mining, manufacturing and recycling. Higher product standards can also trigger companies to relocate their production to developing countries with more relaxed regulations, thereby creating jobs, but potentially also negatively impacting the environment or social conditions. Finally, higher product standards may also result in (undesirable) protectionism, making product exports from developing countries more difficult. In addition to regulations and product standards in the EU and the Netherlands, related legislation in developing countries adds to determine whether effects are positive or negative. Aiming for the highest product value in an open economy without there being proper legislation in developing countries could lead to the undesirable accumulation of for instance e-waste, with potential negative impacts. For example, the practice of burning plastic coating from wires in order to extract the copper may create negative environmental and human health impacts.

As discussed in Chapter 2.2, for recycling, the effects on developing countries depend on where the recycling is taking place and under what circumstances. Generally, the technology required and the related capital are important determinants. Although labour-intensive recycling may appear more beneficial in developing countries with low wages, the social and environmental impacts are not necessarily positive, as environmental and social legislation in many developing countries is either lacking or not enforced. For electronics, important questions, therefore, concern the relevant scale for reuse and recycling, and whether the most efficient recycling processes either involve complex and expensive technologies or cheap labour.

3 Considerations for the Government-wide programme for a Circular Economy

Because of its complexity and the fact that potential effects are highly context-specific and may differ per product group and step in the circular economy, it is nearly impossible to formulate general, substantive guidelines to ensure policy coherence and policy synergies. Here, we provide some guidance in where and how to start.

3.1 Take a system-wide approach and use scenario analysis

As potential effects are highly context-specific, it is important to consider the broader picture before diving into the details, by assessing the entire supply chain and including all stakeholders. There are many uncertainties, and product types and resources each have their own specific characteristics. Systems thinking is essential. For a circular economy, this includes more than recycling. As economies in developing countries develop rapidly, transitions take time, and several global environmental challenges have a long-term perspective, it is important not only to look at the existing systems, but also to take future developments into account, including those in population, economy and technology. A scenario approach is useful here to explore the possible effects of circular economy policies.

3.2 Conduct an impact assessment for new policies

As discussed in Chapter 2, negative effects on developing countries may emerge in response to specific policy proposals. If these effects remain unnoticed, it is difficult at a later stage to fundamentally revise the policy. This calls for the inclusion of an impact assessment into the policy process, to make sure that potential effects on developing countries are taken into account at an early stage, comprehensively and cross-sectoral. Here, other forms of impact assessment may serve as an example, such as the Environmental Impact Assessment.[2] To avoid negative effects, the models to be developed in the *Government-wide programme for a Circular Economy* should identify interventions on the basis of scenarios for specific products and resource chains, and take into account the perspectives of developing countries.

3.3 Address the lack of standards, legislation and enforcement in developing countries

Negative effects may occur or intensify because of a lack of standards and legislation in developing countries, including those related to labour and the environment. Furthermore, where there are standards and legislation, a lack of enforcement can still result in negative effects. Developing countries may profit from recycling through increased employment, while weak labour and environmental standards or enforcement may result in negative social and environmental impacts. And although prioritising higher value uses of products is important, it should not lead to an undesirable accumulation of, for instance, e-waste in developing countries. These potential negative effects should be taken into account when designing policies. For instance, by investing in green growth policies and legislation as well as by enforcement in developing countries.

[2] See http://www.commissiemer.nl/english

4 Considerations for a national research agenda

As discussed in Chapter 2, current knowledge on the potential effects of a circular economy in the EU and the Netherlands on developing countries is highly context-specific and no unambiguous conclusions can as yet be drawn. Therefore, Chapter 3 provides some aggregate policy considerations to be included in the Dutch *Government-wide programme for a Circular Economy*. However, the discussion about potential determinants and policy recommendations also hints at setting up a research agenda, as large knowledge gaps remain. Such a research agenda, for example, could be addressed in the National Research Agenda, of which one route is devoted to the circular economy and resource efficiency.[3]

Overall, more insights are needed into the size of possible rebound effects and the related actual reduction in material exports from developing countries. With respect to the potentially negative effects of cascading, lessons may be learned from existing processes, such as for white goods and brown goods. Furthermore, to align the circular economy more with development cooperation policies, it is relevant to understand the preconditions under which developing countries could profit from a circular economy in the EU and the Netherlands. An important additional question here is that of what factors would determine whether recycling takes place within the EU or in developing countries. Finally, the research agenda could also be used for developing scenarios to think through the various effects.

[3] http://www.wetenschapsagenda.nl/national-science-agenda/?lang=en

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Appendix: workshop participants

	Name	Organisation
1	Frans Oosterhuis	VU University Amsterdam
2	Roger Sheldon	Delft University of Technology
3	Sibout Nooteboom	Netherlands Commission for Environmental Assessment
4	Sijbren de Jong	The Hague Centre for Strategic Studies
5	Kees Baldé	Statistics Netherlands (CBS)
6	Jolein Baidenmann	ISDuurzaam
7	Victor de Lange	CREM
8	Wijnand Broer	CREM
9	Omer van Renterghem	Ministry of Foreign Affairs
10	Jaap Smith	Ministry of Foreign Affairs
11	Tjitske Ijpma	Ministry of Infrastructure and the Environment
12	Daphne Blokhuis	Ministry of Infrastructure and the Environment
13	Tom Kram	PBL Netherlands Environmental Assessment Agency
14	Aldert Hanemaaijer	PBL Netherlands Environmental Assessment Agency
15	Paul Lucas	PBL Netherlands Environmental Assessment Agency