

A hand in a black glove holds a black pen, poised to write on a document. A large, thick black circle highlights a section of the document. The background is a blurred, colorful pattern of light and shadow, suggesting a modern, dynamic environment.

# Are you ready for the circular economy?

The necessity of an integrated  
approach.

The EY logo, consisting of the letters 'EY' in a bold, white, sans-serif font. A yellow diagonal line is positioned above the 'Y'.

Building a better  
working world

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# Introduction

The circular economy in the Netherlands is booming. Initiatives spark and investors are interested. Yet major players take only small steps, and the results remain limited. And even though companies have enough reasons to address the issue, a real breakthrough fails to appear. EY believes that if companies want to benefit from a circular approach, rigorous choices need to be made. This will potentially impact all aspects of contemporary business models such as product design, restructuring of financial models, cash flow forecasting, tax, change management and legal consequences. In this publication EY brings the importance of the circular economy to your attention and presents an integral circular approach.

# 1. Why a circular economy?

During the last century the world experienced enormous economic growth, which led to more prosperity in developing countries. As populations continue to grow and markets become more globalized, material consumption increases as well. By 2050, global resource use is expected to have tripled. This will further increase pressure on society and the environment.

The world faces an unprecedented number of environmental challenges. These are global in scope and interconnected by nature. The human footprint already exceeds the earth's bio capacity by more than 50 %. We exceeded the planetary boundaries for climate change, biodiversity loss and human interference with the nitrogen cycle. Soon, we will also reach the limits of global fresh water use, change in land use, ocean acidification and interference with the phosphorous cycle.

More and more companies feel the responsibility to use their influence and abilities to decrease their environmental impact. They started within their own production sites and offices and are now shifting their focus to their supply chain and beyond.

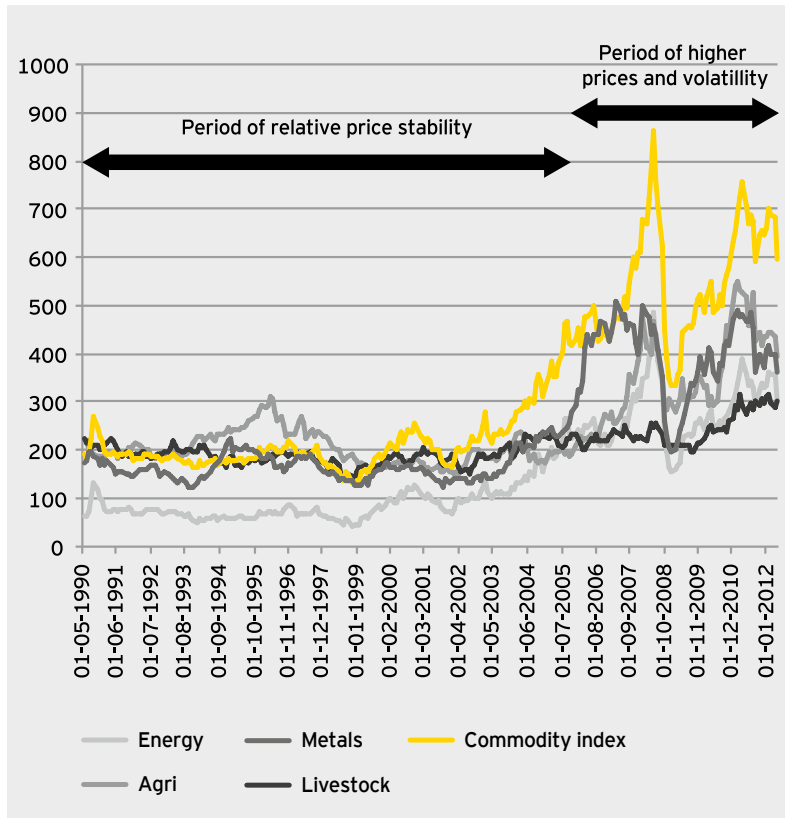
Another incentive to transition into a circular economy is the availability of natural resources. At the current consumption rate, some elements are expected to last no longer than 20 years. This creates major risks and challenges for companies, especially in Europe, where 60 % of fossil fuels and metal resources is imported.

The study 'Vervolgonderzoek Materialen in de Nederlandse economie' (Materials in the Dutch economy, 2015) identified that companies that produce electronics, transport machinery, metal products and furniture are vulnerable for these supply risks.

Element		Periode of availability	
		Consumption at present rate (years)	World consumes at 1/2 rate of USA (years)
Ag	silver	29	9
Al	aluminium	1027	510
Au	gold	36	45
Cr	chromium	143	40
Cu	copper	61	38
In	indium	13	4
Ni	nickel	90	57
Pb	lead	42	8
Pt	platinum	360	42
Sb	antimony	30	13
Sn	tin	40	17
Ta	tantalum	116	20
U	uranium	59	19
Zn	zinc	46	34

**Figure 1:** Consumption rate and availability of 14 elements: David Cohen "Earth's natural wealth: an audit". *New Scientist*, 23 May 2007, pp. 34-41

**S&P GSCI price index**



A circular economy offers a solution to these problems. Think of an economy no longer reliant on raw materials. An economy without waste and with full dedication to renewable energy, renewable resources and high-grade recycling. Several studies show that the circular economy enables the economy to grow, as employment increases and resources are applied more efficiently.

**Figure 2:** Commodity price trends over the past 20 years highlight the new era of resource scarcity Source: Bloomberg, Rabobank, based on S&P GSCI price index in *PATHWAYS TO A CIRCULAR ECONOMY*, Rabobank/ Port of Rotterdam (2012)

## 2. What is the circular economy?

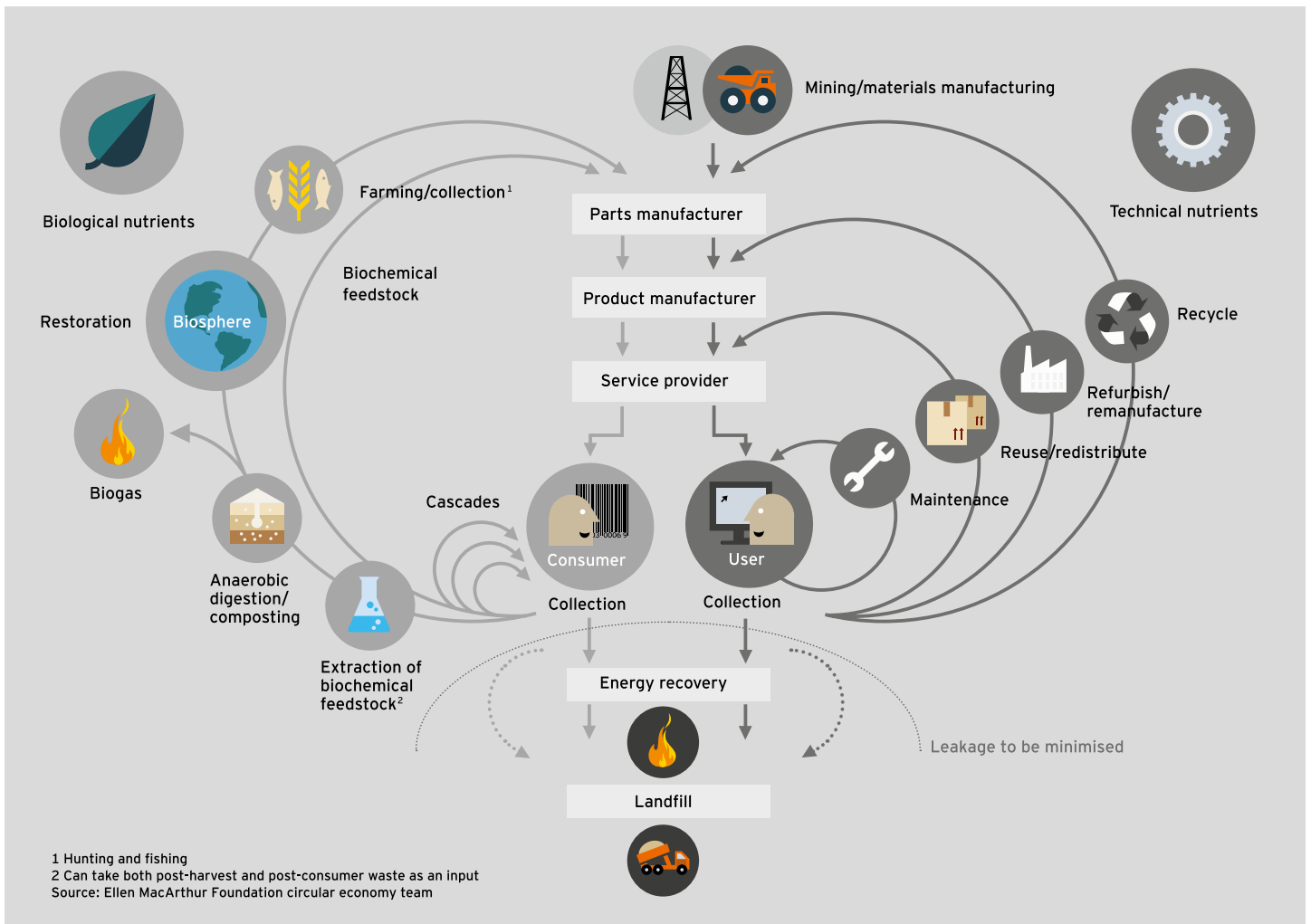
The Ellen MacArthur Foundation - the most authoritative think tank on this subject - defines the circular economy as:

*“an industrial economy that is restorative by intention. It aims to enable effective flows of materials, energy, labour and information so that natural and social capital can be rebuilt. It seeks to reduce energy use per unit of output and accelerate the shift to renewable energy by design, treating everything in the economy as a valuable resource.”*

Although the circular economy is often bracketed together with recycling, these two are not to be conflated. Materials that have been jumbled up

in the waste stream or have been contaminated lose much of their value, and the recycling process to clean and convert them into usable products can itself consume a large amount of energy.

In the circular economy the emphasis is on designing goods to be long-lasting, easy to repair and reuse, easy to disassemble and easy to remake into items that are as good as, if not better than, their virgin equivalents. It is not just about squeezing more life from a fixed stock of resources that have been dug from the ground at the expense of the environment. By developing bio-materials, circular innovators hope one day to replace petroleum-derived plastics with compostable plant-based materials that can be returned to the ecosystem after use.



**Figure 3:** Circular economy model, Ellen MacArthur Foundation (2012)



### 3. How will a circular economy change your business?

Who could have predicted ten years ago that we would now all be using smartphones? And who would have guessed that companies like Kodak would go out of business and a company such as Airbnb would become worth more than the largest hotel chain? Many businesses which were once market leaders have disappeared as new trends emerged, like internet shopping and digital technologies.

In a circular economy, the relationship customers have with the products and services they purchase, will change radically. It is likely that access and performance will become more important than ownership. The shifting relationship would not only allow companies to retain product ownership - for easier repair, reuse and remanufacture - but might even result in producer responsibility obligations being extended to users as part of the purchase agreement.

A circular economy requires businesses to develop new business models. These business models are based on an earnings model, with a personal return for the business operator. Accenture (2015) has distinguished 5 different models, that were adopted by Rabobank (2015) and ING (2015).

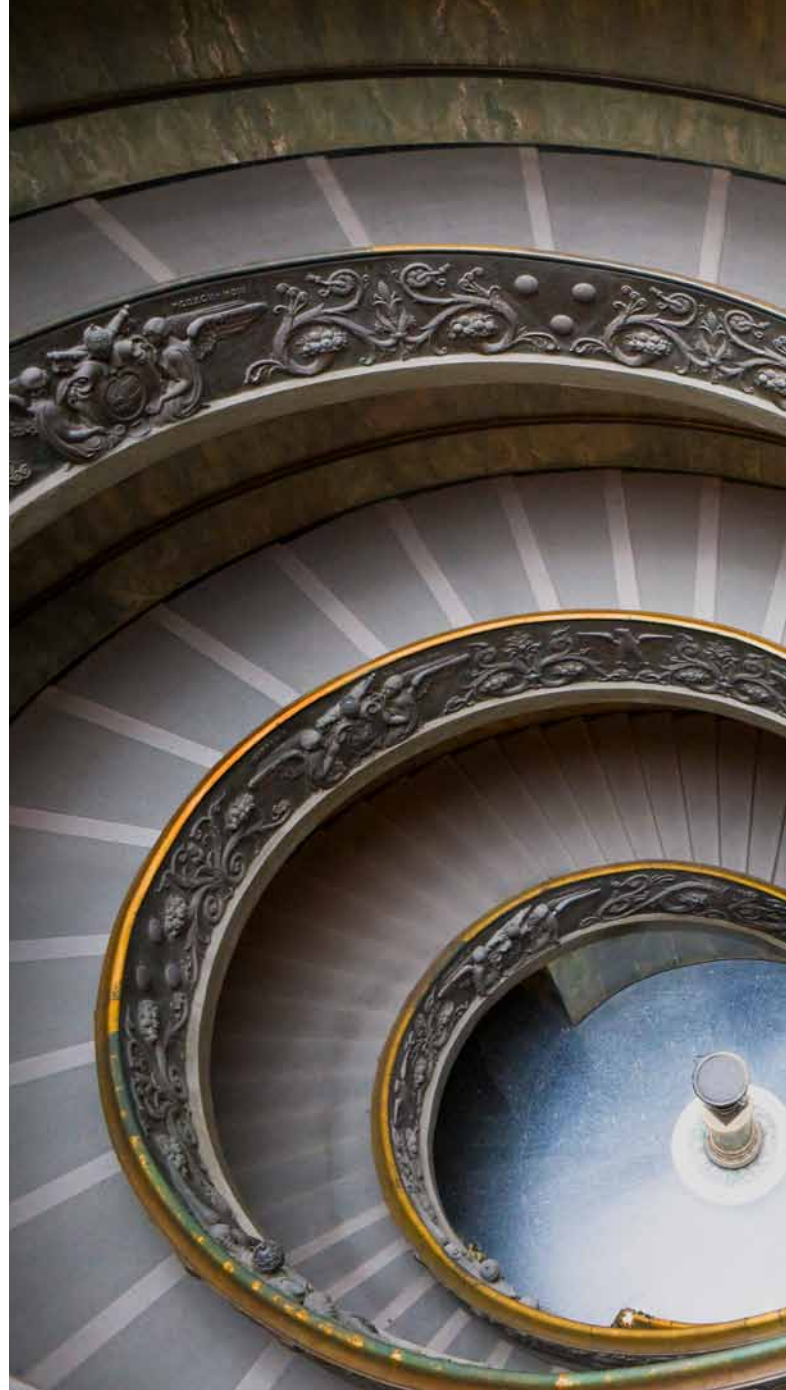
#### A. Circular input models:

Circular input models are designed for the creation of materials and resources suited to the circular economy. Think of, for example, completely renewable fuels and the production of biodegradable and recyclable inputs. Such resources replace linear resource approaches and phase out the use of scarce resources.

##### **Example: DSM's bio-based products & services.**

*DSM pioneers progress in renewable energies such as cellulosic bio-ethanol, advanced (microbial) biodiesel and in renewable building blocks like bio-based succinic acid. The company's strategy is to license its technology and expertise to bio-based entrepreneurs, enabling them to convert biomass in a commercially viable and sustainable way. It is DSM's ambition to further strengthen its portfolio in bio-based chemicals and materials. The exciting technology being developed can be used as a platform for the development of other high potential bio-based building blocks and/or platform molecules.*

**Source:** [www.dsm.com/corporate/about/business-entities/dsm-biobased-productsandservices.html](http://www.dsm.com/corporate/about/business-entities/dsm-biobased-productsandservices.html)



#### B. Waste value models:

Innovative recycling and upcycling play a crucial role in this model. The embedded value of waste is recovered at the end of a product life cycle to feed into another one.

##### **Example: Recycling and reusing paint at AkzoNobel**

*According to research carried out by Akzo Nobel, the average UK resident has about 17 paint pots stored away for future use. As part of the company's drive to improve the sustainability of all its operations, the company produced a feasibility study on how to improve paint recycling and reuse, using the idea of closed loop systems - those that retain materials within the economy over several cycles of use. Goal: to find the most efficient way of working with the local infrastructure to recycle paint in an efficient way.*

**Source:** [www.theguardian.com/sustainable-business/recycling-reuse-fresh-approach-paint-waste](http://www.theguardian.com/sustainable-business/recycling-reuse-fresh-approach-paint-waste)





### C. Lifespan models:

The lifespan of products is extended to maintain or improve the value of the product that would otherwise be lost. It is achieved by repairing, upgrading, remanufacturing or remarketing the product.

#### **Example: Lely milking robot reconditioned and upgraded**

*In agricultural machinery a market has appeared for used milking robots. Milking robots are being reconditioned to prolong their economic lifetime, and they are upgraded with new technology, to achieve the lowest cost per milking – whether clients buy a new robot or a used one. The Lely company makes sure these robots are ready to milk again for many years and ensures quality with its ‘certified’ label Lely Taurus.*

**Source:** [www.lely.com/en/milking/used-milking-robots/taurus](http://www.lely.com/en/milking/used-milking-robots/taurus)

### D. Platform models:

Products and services can be used more efficiently, when goods that are (temporarily) not being used, are made available to others. This can be done by offering platforms for collaboration among product users, either individuals or organizations.

#### **Example: SnappCar car sharing platform**

*SnappCar is an online community that facilitates easy and reliable car sharing. Simple, fast and well insured. Together, all Dutch, German and Danish SnappCar participants share nearly 15.000 cars. This helps them share costs and meet new people in their neighborhood. Moreover, less cars are needed and they contribute to the reduction of CO<sup>2</sup> emission. SnappCar was launched in 2011. By now, they are number 2 online carsharing community in Europe.*

**Source:** [www.oneplanetcrowd.com/nl/project/94226/description](http://www.oneplanetcrowd.com/nl/project/94226/description)

### E. Product as service model:

Instead of selling their product, the business continues to own it. The product is made available to one or more users, either through a lease contract or a rental fee. With this model, product longevity, reusability and sharing become more attractive to the business.

#### **Example: Light as a service**

*Philips, global leader in lighting, has entered into a collaboration with Schiphol Group and Cofely for the new lighting in the terminal buildings at Amsterdam Airport Schiphol. Schiphol pays for the light it uses, while Philips remains the owner of all fixtures and installations. Philips and Cofely will be jointly responsible for the performance and durability of the system and ultimately its re-use and recycling at end of life. Especially for Amsterdam Airport Schiphol, fixtures are developed that have a 75 % longer lifespan than standard fixtures . Parts of these fixtures can be replaced separately. This reduces maintenance costs and ensures that parts of the fixtures can remain in use.*

**Source:** [www.newscenter.philips.com/nl\\_nl/standard/about/news/press/2015/20150416-philips-introduceert-circulaire-verlichting-voor-schiphol.wpd#.Vh\\_pWE3smM8](http://www.newscenter.philips.com/nl_nl/standard/about/news/press/2015/20150416-philips-introduceert-circulaire-verlichting-voor-schiphol.wpd#.Vh_pWE3smM8)

## 4. What are the benefits of a circular economy for your business?

In Europe and around the world, attention for the circular economy increases. It is a potential way for society to increase prosperity and to decrease dependency on primary materials and energy sources. Many business leaders have embraced the circular economy as a path to increasing growth and profitability, and the European Commission has presented a “circular economy package” on December 2, 2015. There is a lively ongoing debate on the advantages of a circular economy for different stakeholders and its implications for employment, growth, and the environment.

### **The circular economy helps to contain risks:**

- ▶ If specific materials are crucial to your process or product;
- ▶ If there is fierce competition for your materials;
- ▶ If resources make up a large share of your cost structure.

### **The circular economy offers opportunities to:**

- ▶ Extend and strengthen customer relationships;
- ▶ Tap into new markets;
- ▶ Become more efficient;
- ▶ Yield extra income.

The possible proceeds of the circular economy are vast. There is academic consensus on the transition to a circular economy promoting employment, due to new services in design, recycling, return logistics, and the export of ‘circular knowledge and skills’. In their study on modeling the economic and environmental impacts of raw material consumption, in a report for the EU commission(2014) it is concluded that an annual resource productivity improvement of 2 % could create two million jobs in the EU-28.

Researchers also expect a circular economy to boost social value, such as for instance innovation, improvement of life and work environment and decrease in traffic. Last but not least, researchers predict a considerable decrease in environmental pressure. “In a scenario with a radical shift to circular economy, the reduction of green house gas emissions in the Netherlands can be reduced by around 23 % after 15 years” (Rabobank, 2015).

The circular economy will be profitable. But there are potential losers as well. The circular economy will, in short, certainly cause a shift.





## 5. What are the main challenges for companies?

The transition to a circular economy is challenging. It requires new skills and a systems-level redesign. At a higher level, systems thinking and modeling will likely come to the fore to help build the right frameworks and guide behavioral change.

To switch towards the circular economy means change on several levels: on the product level, on the level of internal organization and cooperation, and on the levels of chain cooperation, leadership and finance.




**This presents a wide variety of challenges for businesses, like:**

- ▶ The need for knowledge to assess resource risks and quantify environmental impact;
- ▶ Organisational challenges when shifting to a circular company, like requiring new skills from employees;
- ▶ Financial challenges due to changes in business model, like a decrease in cash flow and financing or a growth in staffing;
- ▶ Legal challenges due to the changing relationships between supplier and buyer, creating the need for new legal agreements;
- ▶ Challenges for the tax system, as the development of resources and products will change.

## 6. How can EY help?

At EY, we are committed to building a better working world. A better working world must foster sustainable growth based on strong fundamentals - increased productivity, innovation and a broader talent pool. A circular economy can contribute to these fundamentals.

Taking steps towards a circular economy is a complicated process, that needs to be analysed and resolved from a multidisciplinary perspective. EY has the knowledge and the network to be your partner in this transition. Below we have illustrated EY's circular business approach.

Stage	Question	Activity EY
 <p><b>Awareness</b></p>	<p><b>Find the main drivers of circular business</b></p> <ul style="list-style-type: none"> <li>▶ What are the hotspots based on material flows upstream and downstream?</li> <li>▶ What are the main risks in the value chain?</li> <li>▶ Which opportunities can create additional business?</li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Circular Hotspot analysis</b> (identification of material flows)</li> <li>▶ <b>Mapping of key players in the value chain</b></li> <li>▶ <b>Identification of circular business model scenario's</b></li> </ul>
 <p><b>Strategy</b></p>	<p><b>Select the appropriate circular business model</b></p> <ul style="list-style-type: none"> <li>▶ What are the different business model options available to our business?</li> <li>▶ What is the potential of each business model?</li> <li>▶ What are the strategic fit, timing and preferred choices?</li> </ul>	<p><b>Strategic session to discuss the developed Circular business model scenario's and its implications</b></p>
 <p><b>Embedding</b></p>	<p><b>Design the circular solutions</b></p> <ul style="list-style-type: none"> <li>▶ What are the features and development needs necessary to bring the preferred choices to the market?</li> <li>▶ What are the costs and risks related to the identified options?</li> </ul>	<p><b>Modelling of Circular Business model with an integrated EY team</b></p>



**Franc van den Berg,**  
*partner Cleantech and Sustainability*

“Commissioned by the ministry of economics and together with TNO, EY is researching scarce raw material. What is the top 60 scarcest raw materials? In which products are these materials used?”

At EY we are creating a database of those raw materials of which the end is in sight. These materials will disappear within 20 to 150 years; this underlines the urgency for our society to develop solutions. We also establish the environmental impact of the flow of these goods, and in which country they originate. This insight in raw materials and risks should form the starting point for your strategy. The next step is moving toward a competitive business case. A business that makes yarn out of used textiles should research the value of used textiles in comparison with virgin material. What is the sustainable profit?”



**Michiel Swets,**  
*partner International Tax Services*

“In a circular business, goods are replaced by services. This requires a closer fiscal analysis of taxation such as corporation taxes and customs taxes. Especially if there are international ambitions, it is crucial to investigate international fiscal consequences. The many innovative activities

provide opportunities to use fiscal facilities like the innovation box, de WBSO, RDA and sometimes also the accelerated fixed assets depreciation. EY TAX has a team of experienced tax specialists that can help you map out financial risks, possibilities and administrative obligations. We can help you determine the best fiscal structure in- and outside of the Netherlands and we can point out how to use fiscal advantages and minimize risks. For investors and stakeholders, a sound fiscal analysis is key”.



**Dolf Bruins Slot,**  
*partner Transaction Advisory Services*

“Traditionally, banks and investors are equipped to finance classic revenue models. The complexity of circular business models demands different perspective on a company, for banks as well as for investors. Given the high complexity and innovation of the circular business model, a

sound financial analysis and substantiation of the business case are essential. EY TAS features a team of corporate finance professionals that can help you compose a financial forecast model as well as the support in the funding process. The forecast model we will compose can be used to quantify the impact of challenges and inspire trust at investors and bankers”.



**Frank Zandee,**  
*partner Holland Van Gijzen Advocaten en Notarissen LLP (HVG, Attorneys at Law and Civil Law Notaries)*

“Changing relationships between supplier and buyer require new legal agreements. Multi-party relationships which are highly interdependent will often replace one-to-one relationships and the delivery of goods is replaced with the provision of services.

Furthermore, there is the ownership of intellectual rights, the qualification of relationships between parties within the chain and the qualification of products, byproducts and waste. All of this may lead to a number of issues and complications which need to be addressed. In addition, new forms of financing will be required and parties requiring financing are different.

“What needs to be changed in the agreements and terms and conditions of parties involved?” “Will there be different obligations and liabilities for a party within the chain as a result of a different role?” “Will more dependence mean that one party should have a say over the activities of another party in the chain?”

Together with you, the lawyers of HVG can address these questions and identify legal consequences to minimize risks.



**Dirk Stroes,**  
**director People Advisory Services**

"A key success factor of the circular economy is the way organisations, their employees and their clients will react to this new concept and how they will adapt to the required behavioural change. The circular economy will cause a shift in the way companies operate. It will introduce new business

models and will require new skills from employees. This profound transformation needs to be managed properly to be successful and achieve the objectives.

To successfully realize this organizational change, two major actions are required. On the one hand employees and customers need to be involved in the concept of circular economy and need to get an understanding what this actually means for them. In this way, resistance is minimised and buy-in from internal and external key stakeholders will be achieved. On the other hand, organisations and their employees need to be prepared and trained to perform optimally in the new situation. Acquiring the right skills to operate in the new business model with its new processes as well as setting the required behaviour internally and towards customers, is key. Proper involvement of employees, business partners and customers is a prerequisite for the success of the circular economy."

#### **Main reports on Circular Economy, our top ten:**

1. Stegeman, H. (2015) The potential of the circular economy. From circular materials cycles to a circular macroeconomy with scenario's for the Netherlands, Rabobank.
2. ING Economics Department (2015) Rethinking finance in a circular economy: Financial implications of circular business models, ING.
3. Ellen MacArthur Foundation (2012), Towards the Circular Economy: Economic and business rationale for an accelerated transition, EMF.
4. Ellen MacArthur Foundation (2013), Towards the Circular Economy: Opportunities for the consumer goods sector, EMF.
5. Ellen MacArthur Foundation (2014), Towards the Circular Economy: Accelerating the scale-up across global supply chains, EMF.
6. Ellen MacArthur Foundation (2015), Growth Within: A Circular Economy Vision for a Competitive Europe, EMF.
7. Accenture (2014), Circular Advantage: Innovative Business Models and Technologies to Create Value in a World Without Limits to Growth. Accenture Technology.
8. Cambridge Econometrics, BioIntelligence (2014) Study on modelling of the economic and environmental impacts of raw material consumption, European Commission.
9. TNO (2013), Kansen voor de circulaire economie, TNO-rapport TNO 2013 R10864, TNO: Delft.
10. TNO, EY, NEVI, HCSS, CML (2015) Rapport vervolgonderzoek Materialen in de Nederlandse economie, Ministry of Economic Affairs.



## Contacts

### EY serviceline CaS

#### **From a sustainability perspective:**

Diana de Graaf  
senior manager  
06 212 51 976  
[diana.de.graaf@nl.ey.com](mailto:diana.de.graaf@nl.ey.com)

Franc van den Berg  
partner  
06 212 51 023  
[franc.van.den.berg@nl.ey.com](mailto:franc.van.den.berg@nl.ey.com)

#### **From a finance perspective:**

Tobias Broeders  
senior manager  
06 212 52 345  
[tobias.broeders@nl.ey.com](mailto:tobias.broeders@nl.ey.com)

Dolf Bruins Slot  
partner  
06 212 52 502  
[dolf.bruins.slot@nl.ey.com](mailto:dolf.bruins.slot@nl.ey.com)

#### **From Tax perspective:**

Michiel Swets  
partner  
06 212 51 989  
[michiel.swets@nl.ey.com](mailto:michiel.swets@nl.ey.com)

#### **From change management perspective:**

Dirk Stroes  
senior manager  
06 524 65 914  
[dirk.stroes@nl.ey.com](mailto:dirk.stroes@nl.ey.com)

#### **From Legal perspective:**

Frank Zandee  
partner  
06 290 83 326  
[frank.zandee@hvglaw.nl](mailto:frank.zandee@hvglaw.nl)

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