

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management



Bachelor Thesis

**The Circular Economy: Benefits and Challenges for a
Business**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Veronika Trifonova

Business Administration

Thesis title

The Circular Economy: benefits and challenges for a business

Objectives of thesis

This work is aimed to explore the definition of the Circular Economy, research and analyze principles and practices a business should follow and use in order to function in the Circular Economy. Also, this thesis studies the effect of this economical model on society and environment. However, the main research question of this work is:

What are the benefits for a business and what challenges it may face when functioning in accordance to the Circular Economy concept?

Methodology

The first part of this thesis is based on work with secondary sources such as print publications, academic papers and journal articles. Chosen methodology is theoretical analysis: selection and discussion of theoretical material and descriptive material as well as providing case studies as examples of the researched framework in action.

In the second part of the thesis a qualitative method approach is used in order to gain first-hand information from the owners of businesses functioning in alignment with ideas and principles of the Circular Economy concept. More specifically, the in-depth interview tool is used. This method helps to answer the research question and see how practices are implemented and whether a business does benefit from this framework in today's economic conditions.

The proposed extent of the thesis

approx 45-55 pages

Keywords

circular economy, business, performance economy

Recommended information sources

Arnold, C. Ethical Marketing and the new consumer, Wiley 2009, ISBN-13: 978-0470743027

Hawken, P., The ecology of commerce, Harper 2010, ISBN-13: 978-0061252792



Expected date of thesis defence

2016/17 SS – FEM

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Declaration

I declare that I have worked on my bachelor thesis titled "The Circular Economy: Benefits and Challenges for a Business" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any person.

In Prague on __.03.2017

Veronika Trifonova

TITLE OF THESIS:

The Circular Economy: Benefits and Challenges for a Business

SUMMARY:

This bachelor thesis is aimed at exploring what the Circular Economy is and how does a circular business benefit from applying its principles and what challenges it faces in today's economic conditions.

The literature review gave a broad understanding of the Circular Economy framework: its origin, schools of thought it includes, what are the Circular Economy principles and building blocks, as well as potential benefits and challenges for circular businesses.

After reviewing literature on the topic, six in-depth interviews with people conducting circular businesses in different countries and various industries had been performed and the results were compared with the theoretical findings.

Most of the literature review's findings were supported by the outcomes of the interviews and a few new things were found: a benefit of being more attractive to customers and a challenge of not being able to properly communicate why a company is producing a circular product and what is good about that, therefore failing to make customers interested in and supportive of its offerings.

KEY WORDS:

Circular economy, business, new business model, material efficiency, resource efficiency

NÁZEV PRÁCE:

Cirkulární Ekonomika: Výhody a Výzvy pro Podnik

SOUHRN:

Tato práce je zaměřena na poskytnutí širší pochopení toho, co cirkulární ekonomika je a jak cirkulární podnik prospívá z důvodu uplatnění těchto principů, jaké výzvy stojí před cirkulárním podnikem.

Přezkoumání literatury dal široké znalosti o cirkulární ekonomiky: její původ, školy myslel, že to zahrnuje, jaké principy a komponenty cirkulární ekonomiky, a potenciální výhody a výzvy pro cirkulární podniky.

Po přezkoumání literaturu na toto téma, šest důkladných pohovorů byly provedeny s lidmi, kteří mají cirkulární podnik v různých zemích a různých průmyslových odvětvích.

Výsledky byly porovnány s teoretickými závěry.

Většina zjištění literární rešerše byly podporovány výsledky rozhovorů a několik nových věcí bylo nalezeno: výhoda - být atraktivní pro zákazníky a výzvou - není schopen správně komunikovat, proč se firma vyrábí cirkulární výrobek a co je dobré o tom, a proto ne dělat zákazníkům se zájmem o daný produkt.

KLÍČOVÁ SLOVA:

Cirkulární ekonomika, podnik, nový obchodní model, materiálová účinnost, účinnost zdrojů

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List of abbreviations

BE – Blue Economy

CE – Circular Economy

EMF – Ellen McArthur Foundation

ReSOLVE – ReGenerate, Share, Optimise, Loop, Virtualise, Exchange

The CR – the Czech Republic

1. Introduction

*“The ability to over-exploit the earth’s stored-up supply of resources is what we call **economic progress**”. - Paul Hawken, “The Ecology of Commerce. A Declaration of Sustainability”*

In 20th century, economic growth was supported by the fall in prices of natural resources such as energy, food, water, and materials like steel. However, increased soil erosion, the excessive extraction of groundwater reserves, ocean acidification, deforestation, declining fish stocks, the unpredictable risk-multiplying effects of climate change, and other environmental effects start to put limitations on economic activity. (McKinsey 2011)

Resource-related shock that humanity is facing now is unprecedented, as there never has been such a demand for different resources. Moreover, in the next 20 years, demand will increase, as it is forecasted that up to 3 billion more middle-class consumers will emerge compared with 1.8 billion today. (McKinsey 2011)

Waste accumulated across different industries is the other factor that questions the rationality of the current economic system (Ellen MacArthur Foundation 2015a). European Commission believes that waste is a key environmental, social and economic issue and a growing problem. Annually, approximately 3 billion tonnes of waste - 100 million tonnes of it hazardous – are thrown away in the European Union, which is about 6 tonnes of solid waste for every European citizen. Although landfill and incineration standards have been risen higher and waste management has become more complicated (e.g. separate collection of waste and its recycling), increasing pressure is still placed on ecosystems and waste infrastructure (European Commission 2012). Even though recycling has become a common practice in Europe, it captures only a small fraction of the original raw material’s value. Even successful recycling stories, like PET and paper, lose about 30-75% of the material value after first use. (Ellen MacArthur Foundation 2015a; Ellen MacArthur Foundation & SUN & McKinsey 2015)

Not only materials are wasted today, but also space: in Europe, the average car is parked 92 percent of the time, 31 percent of food is wasted along the value chain, and the average office is used only 35–50 percent of the time, even during working hours. (Ellen MacArthur Foundation 2015a)

Today, it takes the Earth almost one and a half years to regenerate what is used in a year. Even if population dramatically decreases, which is very unlikely, the problem with resources will not be solved, but simply postponed. Current linear system of resource use threatens welfare and wellbeing, as well as competitiveness of businesses, their profits and the business continuity at large. (Club of Rome 2015)

Predictions of resource depletion and toxic contamination are overridden by a belief that humankind will devise new technologies to offset the hazards of old ones. Paul Hawken¹ said in his book called “The Ecology of Commerce”, that “increasing technology and exploitation in the hope of further overcoming such boundaries does not work, for the simple reason that every system has final limit”. (Hawken 2010)

Increased price volatility, supply chain risks, and growing pressures on resources are warning businesses and policy makers, that it is necessary to rethink the ways materials and energy are used today. (Ellen MacArthur Foundation 2015a)

Ellen MacArthur Foundation, SUN, McKinsey & Co in their report called “Growth Within: a circular economy vision for a competitive Europe”, claim that Circular Economy is gaining increasing attention all around the world as a potential way to increase prosperity of the society, while reducing its dependence on primary raw materials and energy. (Ellen MacArthur Foundation & SUN & McKinsey 2015)

Facing limits posed by nature can be a challenge but it is also an opportunity to be creative and make the most of what is available. This is what the Circular Economy is about - keeping products, components and materials at their highest utility as long as it is possible.

This work is aimed at exploring benefits businesses experience when conducted in accordance with the principles of the Circular Economy. Also, the thesis studies challenges faced by circular businesses in today’s economy which is dominated by linear business models.

¹Paul Hawken is an environmentalist, entrepreneur, journalist, and author. His practice has included starting and running ecological businesses, writing and teaching about the impact of commerce on living systems, and consulting with governments and corporations on economic development, industrial ecology, and environmental policy. (from http://www.paulhawken.com/paulhawken_frameset.html; referenced October 2016)

2. Objectives and Methodology

2.1 Objectives

This work is aimed to explore the definition of the circular economy, research and analyse principles and practices a business should follow and use in order to function in the Circular Economy. Also, this thesis studies the effect of this economical model on society and environment. However, the main research question of this work is:

What are the benefits for a business and what challenges it may face when functioning in accordance with the Circular Economy principles nowadays?

2.2 Methodology

The first part of this thesis is based on the work with secondary sources such as print publications, academic papers and journal articles. Chosen methodology is theoretical analysis: selection and discussion of theoretical material and descriptive material as well as providing case studies as examples of the researched framework in action.

In the second part of the thesis a qualitative method approach is used in order to gain first-hand information from the owners of businesses functioning in alignment with the Circular Economy principles and ideas. More specifically, the in-depth interview tool is used. This method helps to answer the research question and see how practices are implemented and whether a business does benefit from this framework in today's economic conditions.

3. Literature Review

“Why waste what can be used in a sensible manner?” - Pieter Winsemius²

3.1 Origin and definition

The idea of a Circular Economy was sketched by Brits-Americans economist, systems scientist, and interdisciplinary philosopher Kenneth E. Boulding in his report “Economics of the Coming Spaceship Earth” (Boulding, 1966). After that it was further clarified by Walter Stahel. In 1976, Walter Stahel and Genevieve Reday presented their research report called “The Potential for Substituting Manpower for Energy” in which they outlined the vision of an economy in loops (or circular economy) and its impact on job creation, economic competitiveness, resource savings, and waste prevention. (Alizadeh 2016)

As defined by the Ellen MacArthur Foundation³, a Circular Economy (further as CE) is one that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. (Ellen MacArthur Foundation 2017)

Markus Zils, an alumnus of McKinsey’s Munich office, says that CE “aims to eradicate waste - not just from manufacturing processes, as lean management aspires to do, but systematically, throughout the life cycles and uses of products and their components”. In his opinion, linear economy follows take-make-dispose philosophy and wastes materials, energy and labour, while the CE builds on tight cycles of components’ and products’ use and reuse, supported by the product design. (Zils 2014)

“Unlike the traditional linear economic model based on a 'take-make-consume-throw away' pattern, a circular economy is based on sharing, leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, where products and the materials they contain are highly valued. In practice, it implies reducing waste to a minimum.” – says Didier

² Former Minister of Housing, Spatial Planning, and the Environment in the Netherlands and current Chairman of the Richard Krajicek Foundation

³ The Ellen MacArthur Foundation was established in 2010 with the aim of accelerating the transition to the circular economy. Since its creation the charity has emerged as a global thought leader, establishing the circular economy on the agenda of decision makers across business, government and academia. (from www.ellenmacarthurfoundation.org/about) It is supported by multiple national and international governments, European Commission, non-governmental organizations, banks, universities and more than 100 global market leaders of different sectors and industries such as Philips, the Coca Cola Company, Vodafone, Kingfisher, Unilever, IBM, H&M, Ikea etc

Bourguignon, member of EPRS⁴ in his briefing called “Closing the Loop. New Circular Economy Package”. (Bourguignon 2016)

The CE is a collective concept and it draws from a number of different and specific approaches such as functional service economy (performance economy), the “cradle to cradle”[®] design philosophy, biomimicry, the industrial ecology and the Blue Economy (Ellen MacArthur Foundation 2015a). These schools of thought will be explained later in this work.

3.2 Biological and Technical Cycles

The concept of the CE distinguishes between technical and biological cycles. Renewable materials flow in the biological cycle, where natural life processes regenerate those materials. Whereas, finite materials are involved in the technical cycle and are intended to circulate in closed-loop industrial cycles as long as it is possible. (Braungart 2016)

Figure 1 presents the EMF’s outline of a Circular Economy. Biological cycles are coloured in green, while technological cycles are blue.

⁴ European Parliament Research Service

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange



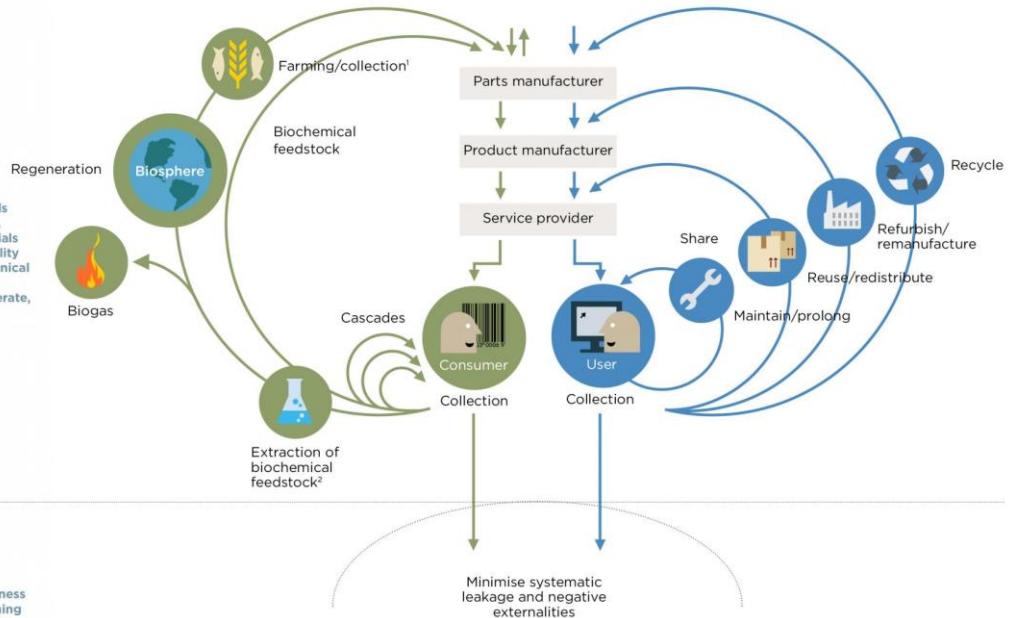
Renewables flow management

Stock management

PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop



PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

Minimise systematic leakage and negative externalities

1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Figure 1 CE System Diagram (Ellen MacArthur Foundation 2017)

3.3 Principles of the Circular Economy

EMF (Ellen MacArthur Foundation 2015a) distinguishes between three principles of the CE, each addressing different challenges that economies of today face.

- **Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows.**

The Circular Economy increases natural capital by circulating flows of nutrients within the system and creating suitable conditions for regeneration of, for example, soil.

There are different ways of controlling finite stocks. Preferably, it is better to dematerialise utility – deliver it virtually, whenever it is optimal. However, if this

option is not suitable, a circular system should wisely and thoroughly select materials and look for technologies and processes that use renewable or better-performing resources, where possible.

- **Optimise resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles.**

Designing products for remanufacturing, refurbishing, and recycling keeps technical components and materials circulating in and contributing to the economy. Circular systems use tighter, inner loops, which means that recycling should be the last option, as depicted on the Figure 1 above. For example, a person should firstly try to repair his defective product instead of putting it into the recycling bin right away.

In the Circular Economy, biological nutrients are returned to the biosphere in the form of compost or other nutrients, from which new materials can be created.

- **Foster system effectiveness by revealing and designing out negative externalities.**

“This includes reducing damage to systems and areas such as food, mobility, shelter, education, health, and entertainment, and managing externalities, such as land use, air, water and noise pollution, and the release of toxic substances.” (Ellen MacArthur Foundation 2015a)

3.4 Building blocks of the Circular Economy

After thorough analysis of case studies, EMF (Ellen MacArthur Foundation 2012) has identified that all examples it studied have in common four things, which are now known as the building blocks of the CE.

3.4.1 Skills in circular product design and production

Careful material selection, development of modular and standardised components, design for disassembly, design to last, and enhancement of production process to minimise waste play important role in creation of an economically successful circular product. These activities have been proved to reduce the cost of moving products into ever-tighter reverse

circles, while not compromising quality of a product itself. To optimise designs and materials for production and repeated use in closed loops, it is needed to have a clear understanding of the whole life cycle of a product from the beginning to the end.

At present moment, separation of biological nutrients from technical nutrients and phasing out toxic materials are under-used, but they should be a priority. In order to simplify separation, products can be modularised so that defected elements can be easily detached and replaced. Also, to enhance the process of separation, manufacturers can use long-lived materials as the core of a modularised products – “e.g., the skeleton that lives on while modules and customisable add-ons are replaced”.

3.4.2 New business models

Companies manufacturing circular products need to present their products’ longer-lasting components’ usage as an attractive value proposition in order to successfully compete with low-cost, highly-efficient, linearly produced products. Another option is to go from selling to providing services and that will make customers shift from ownership to usage. Also, companies could expand the product definition to embed it in related services (e.g., power tools combined with building kits and training).

3.4.3 Skills in building reverse cycles and cascades

Better quality of collection and treatment systems with effective separation of end-of-life products are essential to close the loops and therefore avoid the leakage of components and materials out of the system.

Collection systems must be:

- 1) User-friendly - addressing users’ key reasons for making or not making returns, e.g. guaranteeing complete deletion of a user’s phone data to allay privacy concerns.
- 2) Located in areas accessible to customers and end-of-life specialists.
- 3) Capable of maintaining the quality of the materials reclaimed.

3.4.4 Enabling factors to improve cross-cycle and cross-sector performance.

Support of policy makers and educational institutions as well as cross-sector collaborations will foster the process of making reuse of materials and higher resource productivity as

common and unremarkable as landfills are today. Enabling factors for the CE are discussed in section 3.9 of this work in further details.

3.5 ReSOLVE Framework

Analysis of case studies has also helped the EMF to identify a set of six actions that businesses and governments can take in order to transition to a circular economy: Regenerate, Share, Optimise, Loop, Virtualise, and Exchange – together, the ReSOLVE framework. All of them use different ways to stimulate an increase of products utilization, prolong their lives and accelerate the shift to the usage of renewable sources. These actions are interconnected, meaning that they reinforce performance of each other. (Ellen MacArthur Foundation 2015a)

REgenerate

- Shift to renewable energy and materials
- Reclaim, retain, and regenerate health of ecosystems
- Return recovered biological resources to the biosphere

For example, the European power sector is moving rapidly into renewables. New investments totalled \$650 billion over the 2004–2013 period.

Share

- Share assets (peer-to-peer sharing of privately owned products or public sharing of a pool of products)
- Reuse (second-hand)
- Prolong life through maintenance, design for durability, repair, etc.

For example, the BlaBlaCar car-sharing scheme is growing 200 percent a year and has 20 million registered users in 19 countries. Airbnb has more than one million spaces for rent in more than 34,000 cities across more than 190 countries.

Optimise

- Increase performance/efficiency of product
- Remove waste in production and supply chain (from sourcing and logistics to production, use, and end-of-use collection)
- Leverage big data, automation, remote sensing and steering

Loop

Keeping finite materials in closed loops means remanufacturing products or components and recycling them only as a last resort. While for renewable materials, this means anaerobic digestion and extracting bio-chemicals from organic waste. In the UK, 66 percent of sewage sludge is treated in 146 anaerobic digestion plants, and another 175 plants produce bio-energy from solid waste, a number that is growing rapidly.

Virtualise

Deliver utility virtually – books, music, online shopping and virtual offices.

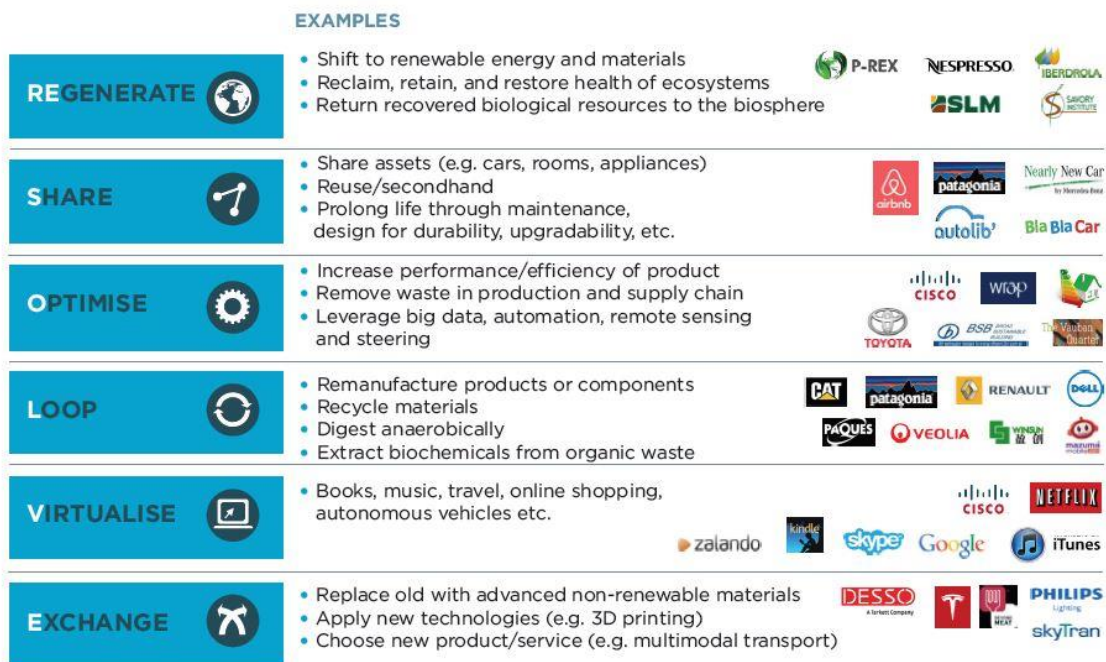
Exchange

- Replace old with advanced non-renewable materials
- Apply new technologies (e.g. 3D printing)
- Choose new product/service

In 2014 Chinese company WinSun 3D-printed ten houses, each about 195 square metres, in 24 hours.

(Ellen MacArthur Foundation 2015b)

As shown on the Figure 2, many international companies have succeeded by using innovative approach in just one of the areas.



Source: Company interviews; Web search. S. Heck and M. Rogers, *Resource revolution: How to capture the biggest business opportunity in a century*, 2014.

Figure 2 - Examples of ReSOLVE actions (Ellen MacArthur Foundation 2015a)

3.6 Schools of thought

3.6.1 Performance Economy

“Do not repair what is not broken, do not remanufacture something that can be repaired, do not recycle a product that can be remanufactured.” – W. Stahel, “Performance Economy”

Walter Stahel, a Swiss architect and an industrial analyst, is known as the father of the Performance Economy. Stahel’s Product-Life Institute pursues four main goals: product-life extension, long-life goods, reconditioning activities, and waste prevention. It also insists on promotion of the performance economy, where services are sold instead of products. (Ellen MacArthur Foundation 2012)

The Performance Economy aims to optimize existing stocks and to provide goods as services. By maintaining product ownership, manufacturers internalise the cost of risks and of waste, which gives them financial incentives to minimise those. Consequently, waste creation would be prevented. (Stahel 2013)

3.6.2 “Cradle to Cradle”

This concept was designed by Michael Braungart⁵ in association with an American architect Bill McDonough. They developed the “Cradle to Cradle” concept and certification process in 1990s. (Ellen MacArthur Foundation 2012)

Cradle to Cradle® design defines a framework for designing products and industrial processes that considers all materials involved to be nutrients – either biological or the technological - flowing in the biological and technological cycles accordingly, which enables the formation of cyclical material flow systems. This framework was born from idea of transforming the footprint of human activities on this planet instead of simply reducing it. (Ellen MacArthur Foundation 2012; Braungart 2016)

The Cradle to Cradle Certified™ Products Program assesses products in 5 categories: material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. (McDonough 2016)

In 2002 Michael Braungart and Bill McDonough published the book “Cradle to Cradle: Remaking the Way We Make Things”.

3.6.3 Biomimicry

Janine Benyus, author of “Biomimicry: Innovation Inspired by Nature” (1997), defines her Biomimicry as “an approach to innovation that seeks sustainable solutions to human challenges by emulating nature’s time-tested patterns and strategies.” Studying a leaf to invent a better solar cell is an example. (Biomimicry 2016; Ellen MacArthur Foundation 2012)

Biomimicry relies on three key principles:

Nature as model: one should study nature’s models and emulate these forms, processes, systems, and strategies to solve human problems.

Nature as measure: one should use an ecological standard to judge the sustainability of an innovation.

⁵ The scientific CEO of EPEA - an international environmental research and consulting institute - and the co-founder and scientific director of McDonough Braungart Design Chemistry (MBDC)

Nature as mentor: one should view and value nature basing on what can be learned from it, not on what can be extracted from the natural world.

(Ellen MacArthur Foundation 2012)

3.6.4 Industrial Ecology

Industrial ecology is an approach that reorients from conquering nature to cooperating with it. It views industrial infrastructures as artificial ecosystems interacting with the natural global ecosystem, taking the pattern of natural environment as a model for solving environmental problems. (Tibbs 1992)

H. Tibbs⁶ in his work called “Industrial Ecology. An Environmental Agenda for Industry” describes industrial ecosystems as systems that recycles, makes the most of recycled materials in a new cycle of production, minimizes waste generation and optimizes use of materials and energy, while seeing “wastes” as a raw material input for other processes. (Tibbs 1993)

A good example of this concept is provided by an industrial cooperation in Kalundborg, Denmark. The industrial ecosystem located there is known worldwide as the Kalundborg Symbiosis. It involves an electric power generating plant, a biotechnology production plant, a plasterboard factory, an oil refinery, a sulfuric acid producer, cement producers, local agriculture and district heating in Kalundborg (*see Figure 2*).

As defined on the official website, The Kalundborg Symbiosis is an industrial ecosystem, where the residual product of one enterprise is used as a resource by another enterprise, in a closed cycle. (Kalundborg Symbiosis 2016)

⁶ strategic analyst, adviser and futures thinker, who is currently CEO at Synthesys Strategic Consulting.

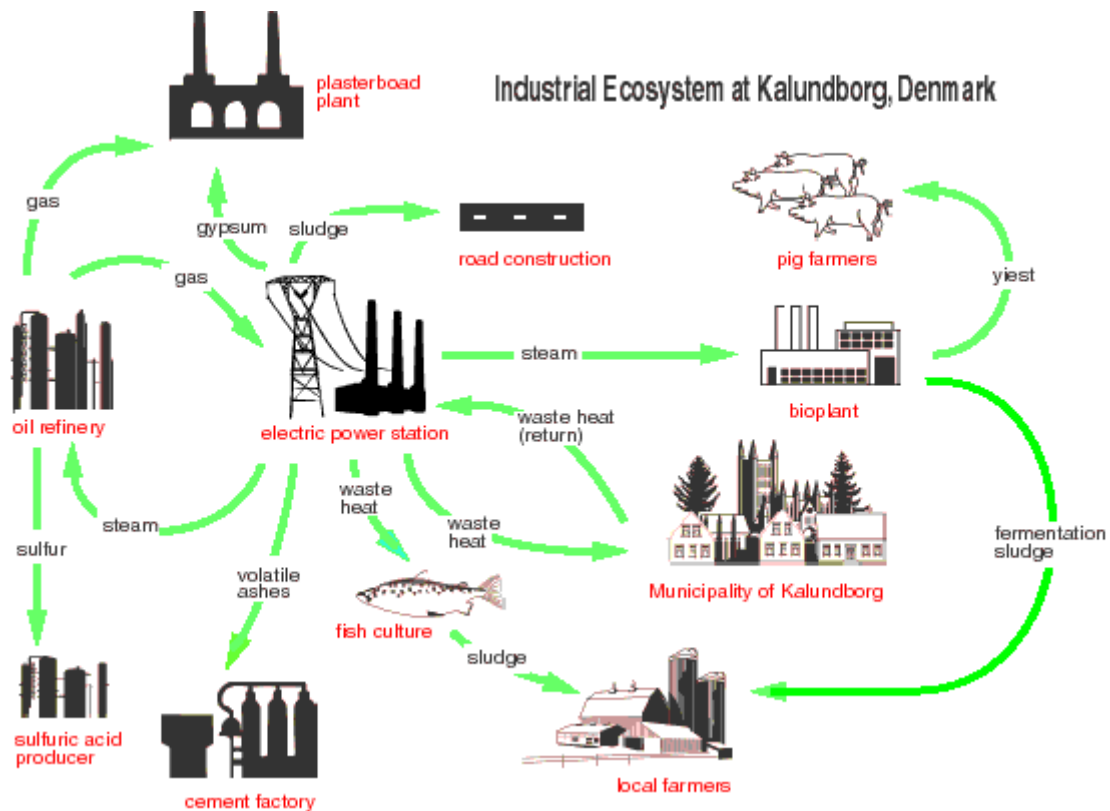


Figure 3 - Kalundborg Symbiosis [source; <http://www.colorado.edu/AmStudies/lewis/ecology/Kalundborg.gif>]

3.6.5 Blue Economy

Initiated by former “Ecover” CEO and Belgian businessman Gunter Pauli, the Blue Economy is an open-source movement bringing together concrete case studies. (Ellen MacArthur Foundation 2017)

The position of the Blue Economy (further as the BE) is a subject to debate. EMF believes that it is incorporated in the generic concept of the CE as all the other previously mentioned schools of thought. However, there are other people, who assume that the BE goes beyond the CE (Huxley 2017; Possible People 2017). K. Medkova in her thesis on the topic of the CE asked in an email conversation the designer of the Blue Economy model itself, Gunter Pauli, about the position of the BE. Pauli stated: “Blue Economy goes much further than circular (economy)” (Medkova 2015).

Both frameworks incorporate similar concepts: cradle-to-cradle, closed loop, up-cycling, reuse, recycling, remanufacturing, industrial ecology, renewable energy, sharing economy. However, the BE also focuses on strengthening competitiveness by lowering costs and

pursuing a more effective economy of scale (Huxley 2017). The BE considers local economic development as a priority, emphasising that this will increase purchasing power and, therefore, more money will circulate regionally, permitting growth without inflation. (Possible People 2017)

3.7 Potential benefits of the Circular Economy

The report of Ellen MacArthur Foundation, SUN and McKinsey & Co called “Growth Within: a circular economy vision for a competitive Europe” (Ellen MacArthur Foundation 2015b) models potential European economic and environmental outcomes in two scenarios – circular economy and current European economy. Also, it examines the effect of a more circular economy on examples of three largest and most resource-intensive value chains: mobility, food, and the built environment.

Results of economic modelling:

- Today’s disposable income of an average European household could increase as much as 18 percent by 2030 and 44 percent by 2050 in a circular scenario, compared with 7 and 24 percent in the current development scenario/
- European GDP could increase as much as 11 percent by 2030 and 27 percent by 2050 in a circular scenario, compared with 4 percent and 15 percent in the current development scenario.
- CO2 emissions could drop as much as 48 percent by 2030 and 83 percent by 2050 in a circular scenario, compared with 2012 levels.
- Primary material consumption measured by car and construction materials, real estate land, synthetic fertiliser, pesticides, agricultural water use, fuels, and non-renewable electricity could drop as much as 32 percent by 2030 and 53 percent by 2050 in a circular scenario.

Most of other recent studies on the economic impacts of a circular and resource-efficient economy show lower results than the “Growth Within: a circular economy vision for a competitive Europe”. Authors of the “Growth Within” say that the reason for it is that their

report “assumes a substantially higher pace of technology change in the big product resource sectors” while most other reports assume a historically witnessed pace.

In 2015 the Club of Rome published a report called “The Circular Economy and Benefits for Society” (Club of Rome 2015) where they studied societal benefits of the CE using the Dutch, Finnish, French, Spanish and Swedish economies as test cases.

The authors estimate results for three different scenarios: the renewable scenario, the energy efficiency scenario and the material efficiency scenario. If all these three scenarios are pursued together, then estimated results will be as following:

- **Carbon emissions** are likely to be cut by two thirds or more, almost 70% in Spain, structurally.
- The **number of additional jobs** would exceed 75,000 in Finland, 100,000 in Sweden, 200,000 in the Netherlands, 400,000 in Spain and half a million in France. This means that unemployment rates could be cut by a third in Sweden and the Netherlands, and possibly more - maybe even cutting unemployment in half, if some of the likely trade surplus gains would be used for investments domestically.
- The **improvement in the trade balance** would be around - or even above – 1,5% of GDP in all the countries studied – representing a few billion euros a year in Finland, more than five billion euros a year in Sweden, around 15 billion euros a year in the Netherlands, 20 billion euros in Spain and 50 billion euros in France.

In January 2016, European Parliament Think Tank published a briefing called “Closing the Loop. New Circular Economy Package” (Bourguignon 2016). Its author, Didier Bourguignon, member of EPRS⁷, mentions five opportunities of moving towards a more circular economy:

- **Reduced pressures on the environment**
- **Enhanced security of supply of raw materials**
- **Increased competitiveness:** a circular economy could bring savings to businesses and consumers through improved resource efficiency.

⁷ European Parliament Research Service

- **Innovation:** a circular economy could trigger a large innovation drive across sectors of the economy.
- **Economic growth and job's creation:** a circular economy could strengthen growth and positively impact employment, although jobs in specific sectors could also be threatened.

3.8 Challenges of the Circular Economy

3.8.1 Externalities

In the Oxford Dictionary, externality is defined as “a consequence of an industrial or commercial activity which affects other parties without this being reflected in market prices”. (Oxford Dictionary 2017)

When pollution is an externality, the polluter lacks incentives to reduce pollution costs, as he is the one who gets the benefits derived from polluting while others pay the cost of it. Pollution is an example of a negative externality, however, there are also positive externalities – for example, knowledge. A firm that invests in the development of a new technology typically creates benefits for others (both companies and consumers) while incurring all the costs. Therefore, the firm lacks the incentive to increase investments in technology.

Patents and other institutions that are used to protect firms' innovations are imperfect protection tools, as, in the end, a successful innovator captures only a fraction of rewards. (Jaffe & Newell & Stavins 2005)

Considering negative externalities, one of the possibilities to incentivize a polluter to reduce his negative impact is to internalize those external costs that he does not pay. Pollution taxes can be an option, however, even though nowadays there are penalties and fines for companies that violate pollution laws or other legislations, their profit often outstrips the expenditures caused by illegal behaviour. The problem here is that those taxes can become just “a cost of doing business”. But Paul Hawken believes that “the purpose of integrating costs is not to provide a toll road for polluters, but a pathway to innovation”. (Hawken 2010)

3.8.2 Prices and Quality of the Secondary Raw Materials

K. Medkova in her thesis “Towards Circular Economy. EU, Finland and Lathi region Perspectives” mentions a challenge of assurance that the secondary raw material costs will be lower and the quality will be better or at the same level as of the primary resources. Investments in technology and innovation can unblock the barrier, while cooperation and sharing of information can accelerate the transition. Also, enforcement of such policy as the green tax could bridge the price gap between primary and secondary raw materials. (Medkova 2015)

3.8.3 Investments

A transition to the Circular Economy would involve considerable transition costs - R&D and asset investments, subsidy payments to promote new business models, and public investment in waste management, as examples. For small and medium-sized enterprises, high costs of transition are seen as major barriers to the adoption of more sustainable practices. (Bourguignon 2016)

3.8.4 Consumer behaviour and business models

The Circular Economy would require systemic shifts in people’s minds. Not knowing much about potential benefits of the CE, consumers and businesses tend to be reluctant to adopt new behavioural patterns and new business models (e.g. leasing instead of owning). (Bourguignon 2016)

Also, certain patterns of behaviour deeply rooted in cultures and habits make transition more challenging. Fast change of collections in clothing industry as well as frequent releases of newest models of cell-phones are just examples of the unsustainability that became a part of today’s culture. (European Environmental Agency 2014)

3.8.5 Regulatory failures

Ineffective or insufficient policy tools, unaddressed implementation problems, lack of coherence between policy instruments, creation of administrative burden, lack of harmonised standards – all these are examples of regulatory failures that present important barriers to the CE. (European Commission 2015b)

3.9 Enabling Factors for the Circular Economy

Challenges imposed by the current economic situation are present in the areas where changes and improvements should be done in order for the transition to happen.

Raising awareness would help consumers to make more educated decisions about their purchases, business to be more open to implementing circular business practices and investors to be willing to invest in circular economy projects.

Education is needed to prepare future professionals, the skill base to drive circular innovation. EMF believes that governments should encourage the integration of the circular economy and systems thinking into school and university curriculums. (Ellen MacArthur Foundation 2015)

Innovation is needed, as different results cannot be expected when old practices are used. Incentivizing innovation, sharing findings, and investing in development of new technologies is crucial. (European Commission 2017)

The transition will require considerable amounts of **investments**. There is the need to promote financial support of new circular businesses, which nowadays are not as appealing to investors as conventional, linear ones.

In order to increase the uptake of circular projects by investors, market participants have to gain understanding of the logic of the Circular Economy. In the report of European Commission on the implementation of the Circular Economy Action Plan (European Commission 2017) it is stated that: “While the business case for the circular economy is clear, this message still has to reach a good part of businesses in the EU and of the financial and banking sector.” Here it is clearly seen how the enabling factors – raising awareness and providing investments - are interconnected.

Economic instruments could enhance the transition – for example, a sustainable tax policy that will make usage of raw materials unfeasible could support usage of secondary raw materials. Also, such measures as green taxes, pay-as-you-throw (PAYT), extended producer responsibility (EPR), Ecodesign Directive, Waste Framework Directive, etc. could incentivize businesses to make the transition. (European Commission 2015a)

Collaboration, both cross-chain and cross-sector. Development of agreements between value chain participants are needed in order to promote traceability and provide reliable information about presence of recyclable materials in products, which could be facilitated by IT (e.g. online database). Also, collaborative platforms could enable joint product development, joint collection systems, industry standards, and aligned incentives. (European Commission 2015a; Ellen MacArthur Foundation 2015)

3.10 Opportunities and challenges for a circular business

3.10.1 Opportunities

Profit opportunities – businesses could achieve lower costs of inputs or even create entirely new profit streams.

Reduced volatility and greater security of supply – circular economy implies using of secondary raw materials, which reduces company's sensitivity to raw material's price changes.

Demand for new business services – circular economy will create demand for new business services, such as reverse logistics, product remarketing, parts and components remanufacturing, etc. Also, all these services will require new skills and that creates opportunity for starting new companies, that specialize in those services, possess needed knowledge.

Improved customer interaction and loyalty – new business models, such as leasing and rentals, engage customers in a new way, making it possible to create long-term relationships with clients.

(Ellen MacArthur Foundation 2015)

3.10.2 Challenges

Competitiveness of linear business models. Competing with high performing linear businesses is a tough task for circular businesses, as they are often behind on financial, organizational, institutional, technological and societal aspects. Bas Mentink in his thesis notes that “due to different aspects, yielding 5 grams from 1000 kg of ore from a gold mine

is still more competitive than yielding the same amount of gold present in less than 35 kg of discarded mobile phones.” (Mentink 2014)

High investments needed, while it might not be easy to get them. Longer time horizons of revenue generation might conflict with interests of short-term oriented corporate management. Also, if a company, for example, leases products, it means that its capital is distributed over hundreds of homes. Could a bank accept those products as a valid pledge? (Mentink 2014)

New information that could show how to make the transition from linear business model to circular easier: what technologies are already in use, what opportunities are there for businesses, etc. Also, companies need new information about recycled materials, e.g. price, supply risk of materials, reparability and expected lifetime (Mentink 2014).

Mentality of the society today is oriented on the ownership, as it has already been mentioned previously. Consumer’s behaviour is considered to play an important part in the transition to circular business models (Planing 2015). It is no secret that demand creates supply – therefore, if people demand more sustainable products, than companies will not have any other choice other than to comply. However, it has been noticed that it takes a lot of time for a reasonable and useful innovation to reach wide-spread acceptance. This phenomenon can be explained by consumers’ unwillingness to change their learned purchasing behaviours (Planing 2015).

Lack of legislative support, i.e. effective tax policy, laws and regulations, presents a significant challenge for businesses aspiring to use the CE principles. For instance, waste legislation in the EU does not have a coherent definition or classification of waste materials and therefore it is hard to distinguish waste from by-product materials used for recycling. This puts limitations on cross-border transportation of waste. (Rizos and others, 2016)

3.11 Case studies

3.11.1 “Light as a Service” solution by Philips

Philips is a Dutch company providing innovative lighting, healthcare and consumer lifestyle solutions. It supports the transition to the Circular Economy and has already introduced “Light as a Service” solution as an option of circular lighting.

“Light as a Service” is a new way of doing business – keeping the ownership of the products and selling the performance, i.e. light, instead. Philips takes care of management, maintenance, innovation and recovery of equipment, while the customer gets what he wants – light. Also, Philips’s customers save money they spend on illumination as the lighting service is tailored to the specific needs of a customer and uses innovative technology. (Philips 2017)

For example, in 2015 the National Union of Students (NUS) was opening a new office in London, aiming at making it one of the most sustainable in the country. The NUS chose Light as Service solution to meet their sustainability goals and Philips provided newest technology in LED lighting (785 light points, which were just 5.9W/m²). This solution ensured best energy and cost savings opportunity for the NUS. (The National Union of Students case study 2015)

3.11.2 Bio-bean

Bio-bean is an English clean technology company that industrialized the process of recycling waste coffee grounds into biofuels and biochemicals. In two years, Bio-bean company raised several millions of private investments, launched nationwide collection service of waste coffee grounds and opened a pioneering recycling factory for the collected waste.

Nowadays, Bio-bean produces biomass pellets used for heating buildings (displacing fossil fuels) and coffee logs suitable for use in wood burners, stoves and chimneys. Coffee logs are cheaper than other briquettes, burn longer than wood and are 100% carbon neutral. The company also researches commercial application of biodiesel made from waste coffee grounds and explores opportunity of extracting biochemicals from this type of waste. (Bio-bean official website 2017)

3.11.3 Black Bear Carbon

Black Bear Carbon is a Netherland's company that turns old tires into the world's first high performance, pure, and ecological carbon black.

Every year over a billion tires are removed from vehicles, resulting into around 13.5 million tons of solid waste. Those waste tires contain a significant amount of high quality carbon black⁸: about 20-25% of the total mass. Usually, these valuable materials are wasted but Black Bear has developed an innovative process of recovery of high quality carbon black from waste tires.

Black Bear's innovation not only makes it possible to produce high performance carbon black with lower production costs, but also to prevent pollution that is a consequence of the standard production process. This makes the company's proposition commercially attractive and allows its product to compete with the furnace carbon black.

Black Bear's carbon black is used in tires, technical rubber goods, and as a pigment in paint, plastic and ink. (Black Bear Carbon 2017)

3.12 Summary

Air, water and soil pollution, waste accumulation, and not a full utilization of possessions such as cars are just examples of signs that warn the society that there is something wrong with the system it lives in. The Circular Economy is seen by some people and governments as the way to improve this unpleasant situation by closing materials loops, remanufacturing products or components, removing waste from production, using renewable energy, virtualizing products, sharing assets and providing more services rather than selling more goods.

There have been studies conducted, which model possible outcomes of the transition to a circular economic model and the results propose such benefits as a growth of an average disposable income, increase in GDPs of different studied countries, a drop in primary

⁸ Carbon black is virtually pure elemental carbon produced by incomplete combustion or thermal decomposition of gaseous or liquid hydrocarbons under controlled conditions. Its physical appearance is that of a black, finely divided pellet or powder. Carbon black is in the top 50 industrial chemicals manufactured worldwide, based on annual tonnage. (source: <http://www.carbon-black.org/index.php/what-is-carbon-black>)

materials consumption, as well as a decrease in the CO₂ emissions and creation of additional jobs.

Current world's conditions present different challenges for the transition to the CE and for businesses willing to follow the principles of the CE. For instance, ownership mentality of the society, considerable transitional costs and existence of externalities that are not present in the prices of products are mentioned in this work as challenges for making the transition happen. However, there are examples of businesses being or striving to become circular even in these imperfect conditions.

In the secondary sources, proposed benefits and challenges that a business experiences when it becomes circular or starts to transition to a more circular model have been found. The next chapter of this work will examine opinions of today's businessmen who run circular businesses or projects. More specifically, practical part is concentrated on benefits and challenges that these companies experience due to usage of a non-linear business model.

4. Practical Part

This chapter introduces the research context and methods applied in this study, as well as the outcomes of the conducted interviews and a discussion of the results.

4.1 Research Context

The research seeks to obtain detailed information from people who founded businesses which are following principles of the CE or are introducing circularity to their business model by, for example, starting a pilot circular project. This allows to enrich the findings with a first-hand information from the respondents, see which theoretical findings it confirms and whether there is anything that can complement them.

When the researched phenomenon is complex and sophisticated, detailed information and background data are needed to gain good understanding of the subject. For this purpose, qualitative methods are used. Their aim is to gain an in-depth understanding of a relatively small number of cases. The most common method in qualitative research is an interview. (Blackstone 2012)

4.2 In-depth Interviews

A semi-structured individually conducted interview was chosen by the author as the methodology for this part of the study.

In a semi-structured interview, an interviewer has a list of questions or topics that need to be covered – an interview guide – but he or she can probe answers if it is necessary to clarify some matter or to pursue a new line of a discussion opened by an interviewee. Therefore, this type of interviews gives enough space for interviewees to answer on their own terms and for an interviewer to ask additional questions if needed. Also, semi-structured interviews are suitable for comparison across interviewees in a study, which was an important argument for the author to use this method in the study. (Edwards & Holland 2013)

Five open-end questions were formulated based on the literature review, all concentrated on the topic of the CE and aimed at answering the research question. Those questions were used to understand a respondent's perception of the studied framework, why an idea of

following the CE principles was appealing for an interviewee, and his/her thoughts on benefits and challenges for a circular business in today's world. When the author, who acted as an interviewer, saw the need, she asked additional questions to, for example, clarify respondent's answer or take his or her opinion on a specific matter.

Initially, this study was not concentrating on any specific region, industry or company's size. In the end, unintentionally the author interviewed people from different European countries. Overall, the interviewees were chosen only by one criterion: they either founded a company that follows principles of the CE or are managing a project that is promoting circularity in a business activity. Not many existing companies today have a completely closed cycle – many of them are on a transitional stage from a linear to a circular business model. Therefore, the author also did not strive to obtain information only from 100% circular businesses.

In the beginning, five companies were contacted, but as some of them did not answer or did not have time for an interview, the author continued to look for and contact different businesses that correspond to the criterion. In total, seventeen companies were contacted. Twelve of them answered to the initial email: some of them declining the proposal of participating in the interview, others expressing their will to contribute to the research. In the end, six out of seventeen people were able to have an interview with the author.

Interviews with businessmen from the outside of the Czech Republic were conducted via Skype calls. Two people from Prague were interviewed in their premises. Due to time constraints, five out of six interviews were not transcribed, but the audio records were made with the permission of the interviewees. The sixth interview was not recorded due to a company's policy.

After each interview, the audio record was re-listened and the meaning condensation analyses were applied. In the case with the interview that was not audio recorded, the author had been carefully taking notes during the interview itself and later structured them, when rewriting.

The outcomes of the interviews are arranged as answers to specific questions for easier understanding and further comparison and analysis carried out by the author. Introductions

of the companies as well as condensed answers of the interviewees are presented in Chapter 4.3.

All the interviews took place in February and March of 2017. The communication of the interviews was in English.

The final analysis is made in Chapter 4.4, where the author cross-analyses findings, compares interviewees' answers with the literature review findings and, also, points out information that was not previously mentioned in this work or was differently understood.

4.3 Condensed outcomes of the interviews

4.3.1 Interview with Angus Grahame

Angus Grahame is the founder of SPLOSH – an English company selling a range of home cleaning, laundry, and personal care products. SPLOSH's products differ from conventional cleaning products by being refillable. It means that a customer buys a bottle for a cleaning product only once and after that he only buys refills – packages of concentrated cleaning liquid, which are delivered by usual mail right to a customer's house. To make a ready for use cleaning product, a customer puts refill in his bottle and adds water. By purchasing SPLOSH products, a customer cuts his plastic waste by about 95%.

SPLOSH products are sold through their website splosh.com and in a few small retail stores.

1. What definition would you give to the CE?

In Angus Grahame opinion, CE is about treating a product or a customer's interaction with a product as a circular, rather than linear function. Concerning SPLOSH, a customer's interaction with the company's product is not "buy a bottle, use it, throw it away", but "buy a bottle, use the liquid, buy a refill, use the bottle again".

2. Why did you choose a business model that corresponds to the principles and ideas of the CE?

Few years ago, Angus Grahame had sold a business he owned and was looking for a new one, which would be benefiting to the environment in some way or at least have less negative impact on it. One day, Grahame happened to be on a supermarket car park, where he was putting his used bottles into recycling bins and at the same time he saw a woman coming out of the super market with her trolley full of new bottles. This contrast of him and the woman made it obvious for Angus Grahame that something is wrong with the way people buy and use products nowadays. That is how the idea of a new type of business was born.

3. How does your business benefit from the principles and practices of the CE framework?

The main benefit is that costs are lower for SPLOSH as refills are cheaper to manufacture and transport than bottles. Also, Angus Grahame can see that customers are attracted to SPLOSH's products because they like the idea of generating less plastic waste.

Grahame also believes that using a new business model benefitted SPLOSH in the way that customers are sort of subscribing to the product rather than using typical model of going to a store, buying a product and a few weeks later going to a store again to buy a new one. Transformed way of buying that is offered by SPLOSH is allowing the company to compete with other brands by differentiating from them on the market.

4. What challenges did you face when starting an unconventional, more circular business? Which challenges does your business face today?

The biggest challenge for SPLOSH has been formulating the product. Analogical concentrated cleaning products never existed before, which made it challenging to develop a concentrate that can be easily turned into a liquid and then used for cleaning. The fact that SPLOSH is a small company with limited resources does not make the formulating easier.

Another challenge is breaking into a market that has many established brands. In case with SPLOSH, less common marketing tools are used in order to attract potential customers and that is helping the company. Not being able to spend a lot of money on the conventional advertisement was a challenge that in the end turned out to be a benefit, as SPLOSH was forced to find different ways to promote itself. Therefore, now it is not directly competing

with the big players of the industry, as it is in a different space (e.g. its products are not on the shelves of big supermarkets, but online and in some small retailer stores).

Also, few months ago SPLOSH faced a problem caused by a new legislation of the EU. The company had been using water soluble packaging for all of its refills before a new legislation came out, which obligated producers to label this kind of packaging. Printing a complicated three colour label is technically beyond SPLOSH production abilities, so the brand is no longer using big (more than 25 grams) water soluble sachets, as they must be labelled.

5. Which factors and tools are needed to support the transition to the CE?

Being innovative, thinking out of the box is what Angus Grahame sees as an important factor for the transition. Business models that are widespread today have existed for many years and they can be rethought. If principles of the CE would be applied to different business of old type, it will generate a lot of interesting entrepreneurial opportunities. Looking at an industry from a different angle could result into establishment of new businesses that operate in a way that is completely unique and circular.

Further, entrepreneurs need to understand that building their businesses around at least one principle of the CE can reduce not only negative impact on the environment, but also costs of operating.

Additionally, Angus Grahame believes that companies are the ones who should be responsible for the waste they generate, not consumers or governments. Thus, he thinks that it would be beneficial if legislation would move into direction of making producers responsible for the waste created during the production process and at the end of a product's life.

4.3.2 Interview with Soňa Jonášová

Soňa Jonášová founded the Institute of Circular Economy (further as ICE) a few years ago as a non-profit organization aimed to spread the knowledge about the CE framework in the Czech Republic (further as the CR). Now the ICE cooperates with companies and municipalities willing to use circular practices and do pilot projects to see whether those practices give some positive results in the CR. Also, the ICE focuses on educating people and businesses on the topic of the CE.

The aim of this work is to gain first-hand information from businesses' founders about their perception of the CE, its benefits and challenges. Although, the ICE is not a company trying to go circular, it is a non-profit organization that works with many businesses trying to do that and, therefore, it has a good overview of the situation in the CR. That is the reason Soňa Jonášová was interviewed.

1. What definition would you give to the CE?

For Soňa Jonášová, CE is a system where no energy, no materials, and no nutrients are wasted. This concept includes sustainable extraction of resources, use of renewable energy sources, use of recyclables, reduced usage of fossil fuels for transportation of circular goods, etc. Products should be designed in the beginning with the thought of what will happen to them in the end of their life cycle – will they be reused, remanufactured or recycled?

2. Why did businessmen, with which the ICE had worked, choose a business model that corresponds to the principles and ideas of the CE?

In the last few years, ideas of the CE became more popular as a result of a new legislation package from the EU called The Circular Economy Package, which includes an EU Action Plan for the Circular Economy. Some companies firstly heard about the CE when they learnt about the package and then they became interested in the framework.

Some daughter companies in the CR have circular economy vision or pillars, as it comes from their parent companies and they are just looking for ways to implement those ideas in the CR. Other companies, that have been on the market for a long time, come to the ICE saying that they need to find new ways to operate, to reduce their costs and to attract new clients.

There are companies that produce a lot of different waste and they have to pay for the disposal of it. When they hear about CE perception of waste as a resource that can become an input into another process, they come to the ICE and ask what possibilities there are for their business, how can they see their waste as a resource?

Considering companies that start from the scratch, usually, they turn to principles of the CE because they want to reduce their costs by saving energy or lowering raw materials

usage. Some companies want to create a sustainable, environmentally friendly product and feel that they are doing something good.

3. How do businesses benefit from the principles and practices of the CE framework?

Right now, in the CR, companies that are the first to implement the CE principles get a lot of attention of media, as they are pioneering those practices, while risking a lot. Thus, these companies get good publicity, which leads to the interest of customers and their better perception of those businesses.

When a company perceives waste as a resource, it saves money and, also, reduces or sometimes even eliminates its negative impact on the environment. The latter makes both company's employees and customers feel better about being a part of this company by working for it or by buying its products.

More and more people are becoming aware of the consequences of the current linear economic model and they start to look for alternatives, like buying second hand products or the ones that are made from secondary raw materials. Therefore, if a company is, for example, taking back its products in order to reuse materials, it wins those customers that are conscious about the impact of their product choices. And such company also becomes more self-sufficient.

4. What challenges do businessmen face when starting an unconventional, more circular business?

Sometimes there are companies that are manufacturing a good quality circular product with all the needed certification, but nobody knows that they are doing it and that this product is circular. Soňa Jonášová believes that if a company is doing something good, like reusing what is considered to be waste or using renewable energy, it needs to communicate it to the public.

However, it happens that a company starts to communicate its product as, for example, an environmentally friendly alternative to other products of this type, but it faces lack of people's interest. More specifically, people seem not to care whether a product was made in a conventional way or in more sustainable and circular. But in Jonášová's opinion, companies often do not communicate it properly. She believes that it is important that a firm not only has a good product, but also a good marketing strategy.

In some cases, even a good communication does not improve people's interest in a circular product or service, because there is not enough information and education on the topic of the CE. Thus, people might not understand the benefits of practices a business uses even when they read about it in an advertisement. That is why some companies, with whom the ICE has worked, said that today's society is not ready for circular products or for buying services instead of a product itself. It also can be that people do not believe that a product made from recycled materials or "waste" can be of a good quality. The ICE has talked to companies that are making good circular products, but they sell it abroad, because there is no demand in CR, because of the prejudice.

Another challenge for circular businesses is to compete with linear businesses. There is no legislation that, for example, lowers taxes for manufacturers who make products from secondary raw materials. In other words, both types of businesses must fulfil same requirements and there is no advantage (like lower taxes or subsidies) for circular businesses. Also, linear production system is cheaper than circular, as you do not have to do something extra, like reverse logistics or remanufacture, which adds costs.

Sometimes it might be that companies prefer using raw materials instead of reusing resources that are considered as waste, because there are strict regulations on the treatment of waste and therefore it is easier not to try using waste than to comply to all the rules and laws.

5. Which factors and tools are needed to support the transition to the CE?

There is a need for legislation that will push companies to use, for example, secondary raw materials. It could be a financial tool that will stimulate companies to do it. In other words, secondary raw materials should be a cheaper and, therefore, a more attractive option for companies in comparison with raw materials.

Also, the CE requires more human labour for remanufacture and repair and it would be better to lower labour taxes, but start taxing, for example, usage of raw materials.

Further, a shift in people's mindsets must take place in order for transition to happen. Governments and media should promote the CE ideas and principles and raise public awareness of this topic, educate people about positive impacts of this concept on society and environment.

4.3.3 Interview with João Almeida

Refiller was started by João Almeida in 2011 as a Swiss non-profit organisation aimed to raise people's awareness of the environmental impacts of waste disposal and to encourage people to reduce amounts of items they throw out. However, Refiller quickly realised that people in Switzerland already had a good understanding of this problem - they needed solutions. Later, Refiller became a company providing refillable cups for coffee and other drinks as substitutes to single-use paper/plastic cups. Refiller's clients were companies with more than 100 workers, universities, and schools. The scheme of the process was following: people used Refiller's cups during the day, then put them into a special collection stations, which were later picked up by Refiller. After being washed, cups were returned to the same offices and universities. The figure below represents the cycle of refillable cups.



Figure 4 How Refiller works (source: <http://www.refiller.ch/so-funktioniert-es/#waschservice>)

Nevertheless, many people were interested in the concept and liked the idea, it was hard to compete with cheaper single-use solutions for everyday consumption. That is why Refiller was closed at the end of 2016.

1. What definition would you give to the CE?

In the opinion of João Almeida, CE is not about recycling materials, but about reusing them by circulating in small loops. Often materials lose their qualities after a recycling process, but in CE materials should be circulating in the same loop and be used for the same purpose as long as possible.

2. Why did you choose a business model that corresponds to the principles and ideas of the CE?

Noticing people's interest in new solutions for the waste problem, Refiller's team came up with an idea of reusable cups service. However, this idea was not unique and novel, it had already been in use in Switzerland - for example, on such events as music festivals. Refiller was trying to use the same approach to every day activities, such as drinking coffee during working day.

3. How did your business benefit from the principles and practices of the CE framework?

As Refiller had not succeeded, it was hard for João Almeida to name some benefits his business had experienced. However, he could say that helping people to reduce their impact on the environment made the company appealing to customers – for example, for employees of a company Refiller worked with. But workers were not paying for this service, as it was financed by the company they worked for and many companies saw this service as an expensive one.

4. What challenges did you face when running an unconventional, circular business?

Competing with linear businesses was hard for the Refiller. Its competitors had prices which did not include negative externalities and therefore they were much lower than Refiller's. Reusable cups were perceived to be expensive, because they costed about three times more than single-use ones.

5. Which factors and tools are needed to support the transition to the CE?

João Almeida believes that it is important to either give a financial support to new circular businesses to help them lower prices of their products (e.g. subsidies) or to develop a tax policy that would be used on products that create waste during their life. One of these options could help businesses that are struggling to compete with linear businesses.

4.3.4 Interview with Vladimír Víšek

Vladimír Víšek is a Sustainability Manager of IKEA Czech Republic, Hungary and Slovakia.

IKEA Czech Republic, Hungary and Slovakia is starting to implement some principles of the CE in its practices and establishing goals that will promote more circularity in its activities. For example, IKEA is aiming to manufacture 100 per cents of its wooden products from recycled wood or wood from FSC certified forests by 2020. Vladimír Víšek also mentioned that creating products from recycled/recyclable materials that will last long and could be dismantled and remanufactured at the end of their life cycle is what IKEA is moving towards.

Recently, IKEA Zličín started a pilot project called Second Life of Furniture (“Druhý život nábytku”), which core idea is to take back not anymore needed furniture from customers and resell it at the store. A customer gets a discount voucher for his future purchases at IKEA in exchange for the furniture he brings back to the store. IKEA secures safety and hygiene of used products and provides 1 year guarantee for used furniture.

The project was started on 5th of January 2017 and IKEA Zličín was getting 30 offers per day in the beginning and in February 2017 it was getting on average 10 offers every day. Similar projects are taking place in some IKEA stores in Spain and Belgium.

Second Life of Furniture project helps to prolong lives of IKEA products, while proving their quality.

1. What definition would you give to the CE?

In Vladimír Víšek’s opinion, the Circular Economy is another level of sustainability agenda where nothing is seen as waste. It is an ongoing process of using materials: not discarding them, but finding them a new function.

2. Why a decision was made to move towards a more circular business model that corresponds to the principles and ideas of the CE?

On the example of the Second Life of Furniture project, Vladimír Víšek explained that there is a customers’ need for such kind of services. Many people are trying to sell their no

longer needed IKEA products and IKEA Zličín answered to this trend with setting up its second life project.

All in all, Vladimír Víšek believes that the transition to a more circular business model is not a question of “if”, but “when”. If a business wants to still be there another 10 years, it has to make a change in the way it operates.

3. How does a business benefit from the principles and practices of the CE framework?

As already mentioned above, to meet people’s needs, a business has to start implementing some practices of the CE and it will doubtlessly benefit from that, as otherwise it will not survive. Also, costs reduction is a positive outcome that cannot be underestimated. Lastly, securing sources for the production is a benefit, because it gives a company an opportunity to be less dependent on resources and therefore less sensitive to the price volatility of raw materials.

4. What challenges do businessmen face when starting an unconventional, more circular business?

Vladimír Víšek believes that legislation is not ready for the CE yet. There is a need for a new definition of waste and for development of new ways of handling it. Nowadays, it might be hard to reuse what is considered to be waste because of the legislation in force.

5. Which factors and tools are needed to support the transition to the CE?

Vladimír Víšek believes that in order for the transition to happen, governments, businesses and educational institutes have to work simultaneously. Governments could provide legislative support and educational institutes can raise awareness of the topic, while giving enthusiastic people a place to develop innovative strategies or technologies. At the same time, businesses should acknowledge the need for a change in their business model and communicate the reason behind those changes to their customers to again, raise the awareness.

4.3.5 Interview with Ayumi Matsuzaka

Ayumi Matsuzaka is the founder of DYCLE – a Berlin based non-profit initiative that offers a solution for parents who want to dispose of baby diapers in a sustainable

way. DYCLE – Diapers Cycle – mixes biodegradable diapers with charcoal and kitchen waste and then turn it all into a hygienic and fertile black soil. Afterwards, the same parents, who used compostable diapers and collected them for the DYCLE, can use these nutrients dense soil to plant trees which will in turn provide fruit and nuts to their community. In this way, diapers cycle closes, keeping nutrients in use and providing a positive externality in the form of fruits that can be used, for example, for production of baby food or juices.

DYCLE official start is planned for autumn 2017, however, a pilot project went live in May 2015 and proved the feasibility of the idea. Twenty families took part in the project and were provided with prototypes of bio-based diapers produced by a partner start-up company.

DYCLE does not sell or produce diapers, instead it provides communities of parents with simple do-it-yourself machines and biodegradable materials, then teaches parents how to make diapers and later collects used ones. All the company gets is a monthly fee paid by each family which is considerably lower than an average family's monthly expenditure on conventional diapers. This should promote the use of compostable diapers, as often environmentally-friendly products are more expensive and it discourages people from using them.

In spring, DYCLE invites involved families to plant trees and a few years later the same people come to reap a harvest.

1. What definition would you give to the CE?

In the Circular Economy, businesses imitate the nature by creating a cycle and finding ways to close it without creating waste. A company's responsibility covers all stages of a product's life.

2. Why did you choose a business model that corresponds to the principles and ideas of the CE?

Ayumi Matsuzaka is an artist who has worked for a several years with a scientist. They were experimenting with turning human excretion into a rich black soil. Matsuzaka and her colleague created many art projects, some were exhibited at museums – visitors could plant trees and flowers in the soil created from excrements.

Few years Ayumi Matsuzaka noticed that parents feel guilty for producing so much garbage when having a baby. Inspired by her successful experiments, she came up with a solution for parents – composting used diapers and using “waste” as an input into another process.

3. How, in your opinion, will DYCLE benefit from principles and practices of the CE framework?

Ayumi Matsuzaka believes that DYCLE will benefit from having multiple revenue streams, even though none of them will be very big. First stream is, of course, the monthly fee, second is selling of the soil to farmers or other companies who need a fertile soil. Also, DYCLE can consult companies from other cities and countries, who want to adopt the same business model.

Additionally, some politicians have already contacted DYCLE because they are interested in waste reduction in their regions. Ayumi Matsuzaka has not clearly understood yet how exactly they want to cooperate with her organisation, but she thinks that it is great that people from different fields take an interest in what DYCLE is doing and are willing to collaborate and learn from the organisation.

Approaching an old problem from different angle helped DYCLE to stand out and gain attention, spreading the word about their solution to waste issue.

Also, DYCLE can support families by providing them with fertile soil that they can use to plant vegetables or fruit trees and later consume or sell their harvest. Although it does not directly benefit the organisation, Matsuzaka sees it as a positive externality and values it.

4. What challenges has your business faced so far?

A few companies agreed to produce compostable diapers for DYCLE but later cancelled the agreement, because they found it not profitable. Diapers’ producers are focused on mass production – 500-800 diapers per minute – and stopping production and changing materials in the machines to produce a relatively small amount of biodegradable diapers does not appeal to them. Now DYCLE is no longer looking for a producer, but instead it is aimed at providing communities of interested parents with simple, low technology machines so that they could make diapers themselves. Distributing one machine for a

group of twenty families complemented with a workshop on how to work with the machine is now the plan of DYCLE.

Another thing that Ayumi Matsuzaka sees as a challenge is that when a company is working with nature, it needs to follow its cycles, e.g. it is not rational to plant trees in summer. Activities has to be planned in a way that complies to the rules and seasons of the natural world. - also you are not always able to predict; time management. 26 min

5. Which factors and tools are needed to support the transition to the CE?

Ayumi Matsuzaka believes that in order for the transition to happen, companies do not need to wait for a perfect time to come. Instead, they need to start taking small steps now: create a prototype or a pilot project, show it to people, tell about possible outcomes, share knowledge and experience. The more people know about and support the idea of an organization, the easier it will be for it to reach out to scientist and local authority. With their help, ideas can be tested on a bigger scale and innovations' feasibility can be proved scientifically. In this way, a company can force changes to happen.

Matsuzaka thinks that a financial support from a government is good, but city authorities or a government can collaborate with and support a company in different ways, e.g. giving a permission to plant trees in a city's park or provide a place for an office.

All in all, collaboration is seen by Ayumi Matsuzaka as the most important factor, because companies, citizens, local city authorities, and governments are responsible for different aspects that can foster the transition, and therefore they need to act together to enhance this process.

4.3.6 Interview with Joost de Kluijver

Joost de Kluijver is the founder of Closing the Loop - a Dutch company and NGO that is making mobile phones circular. It was started in 2012 as an NGO that was aimed at reducing electronic waste. Later, Closing the Loop became a company specialized in making telecom industry, more specifically mobile phones usage, more sustainable.

In developing countries, De Kluijver's company and its local partners collect electronic waste, which consists of mobile phones that cannot be used any longer. Later, this waste is recycled in Europe, where proper recycling facilities are available. In this way, Closing the

Loop makes sure that electronics do not end up in dump sites in developing countries and that valuable materials are not lost: they are extracted from used phones and sent to the global market of precious metals where companies can buy them and use as secondary raw materials for a new production. It does not necessarily have to be mobile phones industry. Often metals that are extracted from mobile phones waste are purer than metals extracted from ore and the process of their extraction is not as polluting as mining.

Closing the Loop also provides solutions for enterprises in Europe which are looking for ways to make their mobile phones usage more sustainable. One of the services offered by the company focuses on a life cycle extension: making sure that technical life span of a mobile phone is used fully. Closing the Loop does it by buying redundant mobile phones from companies and then giving them a second life anywhere in the world where they are in demand. The other service that is offered by the company is the offsetting of negative impacts that mobile phones have. For example, when a company buys new mobile phones, Closing the Loop collects scrap phones on its behalf and in the result, those new phones become “materials neutral”, as Joost de Kluijver calls it.

1. What definition would you give to the CE?

De Kluijver believes that the idea of the Circular Economy – an economy where no waste is created, minimum energy is used and no materials are lost – is utopian. However, striving for being a more circular company is still perceived by him as a good aim that can help an organisation to improve its processes, make itself more efficient. But the way circularity is seen today is much too idealistic and not attainable, especially in a short term.

2. Why did you choose a business model that corresponds to principles and ideas of the CE?

Growing up with understanding that it is not good to waste food or energy and then, also, having experienced unwanted situations connected with mobile phones waste while running a previous company, Joost de Kluijver came up with an idea of a business that corresponds to his values and improves the telecom industry that he had been working in.

3. How does your business benefit from principles and practices of the CE framework?

Circular concepts make a businessman shift his focus from end-product to the whole value chain. When the latter is re-evaluated, new opportunities and options, which are not available in a linear business model, can be discovered. That is seen by Joost de Kluijver as the main benefit.

4. What challenges does your business face today?

Waste collection is challenging in developing countries and Closing the Loop experiences a lot of difficulties when working there, e.g. involving governments, explaining the idea behind the business to stakeholders, making sure investors understand what the company is doing. Circularity is a relatively new concept and it is not a top priority in developing countries. It leads to additional work of explaining the concept and only then the company gets support.

Joost de Kluijver suggests not to combine innovation and a new market, as his company did, as it makes running a business more challenging.

Also, shipping waste from Africa to Europe is not a common occasion and such activity is not supported by the legislation in place. Although the intention behind these shipments is not to pollute European countries with mobile phones waste, but to deliver it to a place where it can be reassembled, so that valuable materials can be reused, Closing the Loop has been experiencing difficulties in getting the right permits for its activities. De Kluijver hopes that in the future the situation with the legislation in force will change and make it easier for his company to operate.

Lastly, getting financial assistance has become more challenging for Closing the Loop in recent years. At the conceptual phase, the company was getting a lot of support from investors and attention from media, but in the last few years, when implementation of the concept has started, many challenges arose and it became harder to find investors willing to fund the company.

5. Which factors and tools are needed to support the transition to the CE?

Linking social enterprises, that have necessary skills and expertise in circular practises, with big players from the same industry is a way to make the transition to a more circular economy happen. It is important that a company has a real-life experience in the field which it can share with bigger organisations, not just theoretical knowledge.

Often businesses are reluctant to make the transition because they are satisfied with their profits, therefore do not see the need to make changes and are even afraid of doing so. Also, they might not fully understand how serious resource scarcity issues are and what consequences of ignoring them can be. It is crucial to understand why companies are not willing to be more circular and educate them on benefits of being a circular business, such as reduced costs, self-efficiency, etc.

4.4 Results

4.4.1 Results and Discussion

The interviews have provided the author with valuable information from people who are conducting businesses and projects in accordance with the principles of the CE. After performing cross-analysis of the interviews, the author has found that there are answers which support some findings from the literature review. She also has noticed a few things that are either not mentioned in the theoretical part of this work or the way the interviewees understand them differs from the information gained from secondary sources. This moments are discussed and clarified in this subchapter.

All the interviewees gave a similar definition to the CE – an economic model that imitates nature in the sense that it circulates materials, eliminating waste. However, one of the interviews expressed his doubts about possibility of establishment of a 100 per cents circular economy.

What was noticed by the author, is that the word “recycling” is often used when people speak about the CE, while recycling, the way it is known today, does not correspond to the principles of the CE. In a circular system, materials are recycled in the sense that they are circulating in the same loop (or cycle). Whereas in contrast, this word nowadays is usually used to describe the process of downcycling: recycled materials do not return to the same condition, are of a lower quality and are used for a purpose different from the initial one.

The author believes that the interviewees used this word to describe materials’ circulation in loops, their reuse rather than recycling. But usage of this word can create a confusion and therefore she wants to clarify this moment and assumes that there is a need to work in the future on making it clear for people that the CE is not about recycling in the sense we know it today.

Considering reasons the interviewed people decided to run a circular business, one of the most popular ones is the cost reduction. For a big company, it may mean not spending enormous amounts of money on waste disposal, while for a small enterprise it may mean saving money by using less energy and primary raw materials. Also, a few interviewees mentioned that they saw a demand for services and products that reduce waste. In the

author's opinion, this could mean that consumers who look for sustainable options will appreciate companies that endorse their initiative of waste reduction. Finally, some entrepreneurs rely on principles of the CE to create a business that positively impacts the environment and corresponds to their own values.

As for the benefits that interviewees see in doing a business in accordance with the ideas and principles of the CE, reduction of operational costs is one of the most frequently named and this answer corresponds to the literature review findings. Further, using a new business model and, also, approaching the market from a different side, utilizing new opportunities is perceived as a benefit. This helps to, for example, create multiple income streams or to engage customers in a new way. However, engaging customers is not the only way to improve relationships with them. The interviewees said in various ways that their businesses and projects were more attractive to customers because they helped them to get what they want while not creating waste. The author assumes that circular businesses make customers feel good about buying their products or using their services.

Also, as linear businesses dominate the economy today, new unusual businesses that are trying to close loops of materials are getting a lot of attention from media as pioneers, which is good for their promotion. Doubtlessly, if situation changes and much more circular businesses arise, media will not be paying much attention to such companies, but for now this can be regarded as a benefit.

Competing with linear businesses was mentioned multiple times as a challenge for circular businesses. In one case, it has even lead to the closing of a company. Which can be explained by the fact that linear businesses are more efficient and their products are cheaper most of the times.

In the theoretical part of this work, lack of legislative support is considered to be an obstacle for companies who are transitioning to a circular business model. Conducted interviews have shown that legislation might create a burden for enterprises, e.g. rigorous standards of waste handling. Also, enacting new laws (like labelling) can prevent a company from continuing doing its business the same way, although it was not doing anything bad, e.g. polluting water. Therefore, it is better to say that legislation not only fails to provide a little support, but sometimes unintentionally creates additional challenges for circular businesses.

Also, ownership mentality is mentioned in this work as one of the challenges. However, interviews gave the author an understanding that society not only needs to change its mentality but also needs to create new behavioural patterns as well as acquire knowledge of the topic of the CE. Moreover, few interviewees said that raising awareness campaigns should be focused not only on consumers, but also on businesspeople, who decide what goes to the market and how it is produced in the first place. Explaining reasons for transition to a circular business model as well as potential benefits can be helpful to make circular products and services more common. Also, investors can be more willing to uptake circular projects if they have a better understanding of the CE, which supports what is mentioned in the Chapter 3.9 of this work.

In-depth interviews provided the author with new insights in challenges faced by circular businesses nowadays. For example, when creating a circular product, a company is required to develop new techniques, materials, formulas, etc. This can be referred to as an innovation, that requires skilled professionals, time to experiment and investments. Innovation is mentioned in this work as an enabling factor for the CE, however, it can be also a challenge for small companies with lack of financial support. Another thing is that a business may fail to communicate properly its incentives for the creation of atypical products, the ways their goods benefit the environment and, in such manner, it does not manage to make customers interested in and supportive of its offerings. For example, a person might not want to buy a product made from “waste” if he does not know about the process and positive externalities of its production.

As it has already been mentioned in this work, the CE distinguishes not only a technological cycle, where materials are reused and remanufactured, but also a biological cycle, where materials are broken down by micro-organisms to form new nutrients, e.g. biodegradable products can be composted. When a company is intended to optimize its products for the biological cycle, it should understand that nature has its own cycles and therefore there is a need to comply with and consider the laws of nature. It may require adjustments in operations, as it is not possible to take some actions whenever is desired, but only at specific time periods. The author assumes that, in this case, volumes of production can be lower or some processes take more time in comparison with those of linear businesses. Obviously, this challenge is not universal for all circular businesses, but only for those that are willing to circulate their products in a biological cycle.

Enabling factors for the CE were discussed during the interviews. The author sees direct correlation between them and challenges, therefore, she believes that the answers to this question can create a better understanding of actions that should be taken to create better conditions for circular businesses. Legislative support, i.e. need for development of new economic instruments, is the answer that the most of the interviewees gave. Also, results of the interviews support a few more factors and tools mentioned in the theoretical part of this thesis, such as innovation and raising awareness. Both these options were frequently named.

The author wants to complement theoretical findings with new perception of enabling factors, more specifically, of collaboration. Previously in this work collaboration implied joining forces with different value chain participants (cross-chain) or with other companies (cross-sector). However, the interviewees used word collaboration to describe taking actions on different levels, i.e. everybody from a citizen to a politician should be educated on the topic and willing to make the change happen.

4.4.2 Validity and Reliability

Such literature review's findings as reduced dependence on raw materials, demand for new services and need of a new information were not supported by this practical part. However, it does not mean that they are irrelevant or unimportant. The reason for this occasion could be that those benefits or challenges do not reside to all industries.

The author acknowledges that for a specific industry or a certain country list of benefits and challenges could include some additional options and exclude some of the ones mentioned in this work. Also, if steps towards the CE are taken, then over time, some of the challenges will most probably become irrelevant, as these obstacles will be already overcome and other will come to the fore. However, considering the current state of the world, the interviews helped the author to make an overview of the today's situation in general, which was the aim of this work.

Also, if the interviews are redone, following the exact questions and themes, the outcomes may differ because responses might be influenced by, for example, frame of mind of the interviewer or an interviewee, as well as by other circumstances, such as time pressure.

5. Conclusion

Different environmental effects start to put constraints on the economic activity, and because of that the Circular Economy concept is gaining its momentum worldwide: circular businesses are being started in different countries and various industries. This thesis identifies benefits of adopting circular economy business practices, as well as challenges circular businesses face nowadays. This is done by reviewing literature on this topic and conducting in-depth interviews with founders of businesses or initiators of projects that follow principles of the Circular Economy.

Study of secondary sources on the subject has shown that main benefits for a circular business are profit opportunities (i.e. multiple income streams, lowered operational costs), reduced dependence on raw materials, demand for new services and improved customer interaction. While challenges found in the literature on the topic are lack of legislative support, competition with linear businesses, need of high investments, ownership mentality of the society and lack of information on available technologies and recycled materials.

In-depth interviews with people running circular businesses in different countries and industries correspond to the aim of this work to form an overall perspective on the situation, understand challenges and benefits for a business which is aiming to be circular nowadays.

Qualitative research has shown that people, who are currently running circular businesses or projects, see reduction of operational costs, exploring and using new opportunities, getting attention from media as pioneers and being attractive to customers as companies that are doing a good thing as benefits. Such challenges as competition with linear businesses, lack of legislative support and ownership mentality of the society were confirmed by the interviewees and a deeper understanding of those obstacles was gained. Also, in-depth interviews complemented theoretical findings with new insights into the challenges that circular businesses face. For instance, developing new products and technologies, which can be referred to as innovation, was not mentioned in the literature review of this work as a challenge. Not being able to properly communicate what exactly a company is doing, why it does it differently from linear companies and how it benefits the environment and society was discovered as another obstacle. Lastly, need to comply to the laws of nature when optimizing a product for the biological cycle was mentioned in one of

the interviews as a challenge and had not been found in the literature the author reviewed. Even though this obstacle is not universal for all circular businesses, it is still important to acknowledge this limitation for the certain type of circular companies or projects.

Benefits mentioned in this work can be used to understand what could motivate companies to make the transition to a circular business model, while challenges and enabling factors show where the changes should be made to foster this process. Also, the additional questions asked by the author such as the definition of the CE and reasons to transition to a circular business model present how do businessmen perceive the CE and why its principles seem appealing to them.

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