

# SUPPORTING COMPANIES IN TRANSITION TOWARDS A CIRCULAR BUSINESS

*Irene Robberegt*



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## DESCRIPTION

# RESEARCH REPORT

## ABOUT SUPPORTING COMPANIES IN TRANSITION TOWARDS A CIRCULAR BUSINESS

Author	Irene Robberegt <a href="mailto:irenerobberegt@gmail.com">irenerobberegt@gmail.com</a>
Student number	940424003
Organization and contact	Cleantech Regio Eddy Tulp, supervisor
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Universities	VHL University of Applied Sciences XAMK University of Applied Sciences
Tutors	Mareie de Jong and Xantho Klijnsma (VHL University of Applied Sciences) Arto Sormunen (XAMK University of Applied Sciences)
Abstract	<p>A research about the role of Cleantech Regio, when supporting companies towards a circular business. This research contains interviews with companies to discover the desires of certain support, interviews with similar organizations to find out what experiences they had, and literature research to find relevant sources in this topic. The conclusion of this research exists of a combination of roles: Connector, Pusher, Inspirer, and Knowledge sharer/ creator. The main recommendation is to found an association under the Foundation of Cleantech Regio. Besides that, some instruments are given which belong to the main recommendation: having a Triple Helix network with members, the organization of events where workshops are offered, the Koploperproject (English: Forerunner project), a communication strategy with newsletters, and an online platform.</p>

Source frontpage: Map of The Netherlands, found at [https://nl.wikipedia.org/wiki/Bestand:Blank\\_map\\_of\\_the\\_Netherlands.svg](https://nl.wikipedia.org/wiki/Bestand:Blank_map_of_the_Netherlands.svg) , combined with illustration of Cleantech Regio and logos of Van Hall Larenstein and Xamk University of Applied Sciences, edited by Irene Robberegt

## **PREFACE**

This report is about supporting companies in transition towards a circular business. The research is part of my final thesis for my studies Environmental Sciences and Environmental Engineering at VHL University of Applied Sciences and XAMK University of Applied Sciences, with major topic Energy management & Climate. The study was commissioned for Cleantech Regio organization. The thesis research was carried out in the period of February 2017 until July 2017.

During this process, Mareie de Jong and Xantho Klijnsma of VHL University of Applied Sciences and Arto Sormunen of XAMK University of Applied Sciences, advised me. Together with Eddy Tulp (Cleantech Regio), the problem description and research questions were figured out. I would like to thank the teachers and Eddy Tulp for answering all my questions during this process. I am very grateful for this great cooperation!

Last but not least, I would like to thank all respondents who have been participating this research. Without you this research was not possible!

I hope this research can have a great contribution in development of the purpose Cleantech Regio has. I hope the Stedendriehoek and, in the end, The Netherlands can be a successful pilot for the circular economy!

Irene Robberegt

*4<sup>th</sup> of July 2017, Leeuwarden, The Netherlands*

## **SUMMARY**

The government of The Netherlands have decided the Dutch economy to be circular by 2050. As mentioned in the report 'The Netherlands circular in 2050': The crucial cooperation is between companies, research institutes and NGO's: on local, regional, national, and international levels (Netherlands, Nederland Circulair in 2050, 2016). Public-Private Partnerships are needed when it comes to cooperation between the Triple Helix: education, government, and companies. Cleantech Regio is a Public-Private Partnership foundation for the region of Stedendriehoek (city triangle Apeldoorn, Deventer, and Zutphen) in The Netherlands.

Although Cleantech Regio has a policy towards a circular economy within the region, they do not know how to support the participating companies and what their role might be. To find out what the role and policy of Cleantech Regio could be, this qualitative research was carried out, focused on the evaluation of the role of Cleantech Regio into the transition process of participating companies and to compare the results of this evaluation with the outcome of similar transition processes in other, similar, regions.

The research question was:

*What is the most efficient/ effective role or combination of roles for Cleantech Regio in supporting companies within the region of Stedendriehoek in transition towards a circular business?*

The research was carried out by literature review and interviews with companies and with similar organizations of Cleantech Regio. The aims were to find out what conclusion could be drawn from literature related to roles and activities of certain organizations and general information about the transition towards a circular business, what kind of support desired is by companies which are interested in circular business, and what experiences similar organizations of Cleantech Regio have with supporting companies.

The interviews were reviewed by the programme Kwalitan. This programme can process qualitative data into relevant information. The code-tree method is used for ordering all information of interviews. Due to the use of the code-tree, an number of topics could be made: Government, Legislation, Circular business, Education, Tasks for Cleantech Regio, Connecting & Cooperation, and Organization & Triple Helix. All information of respondents, was mentioned under these topics.

For literature, the same topics were used for organizing all information. The collected information was compared to each other during analysis. And after that, the model of Unilever: 5 Levers for Change (Unilever, 2011) was used. This model has been developed to change people's behaviour. The model is interesting for Cleantech Regio since Cleantech Regio needs to stimulate and motivate companies first. In addition, these companies must stay connected to and involved with Cleantech Regio. This model was very useful for interpreting the results.

The conclusion of this research is divided into 4 roles: Connector, Pusher, Inspirer, and Knowledge sharer/ creator. The main recommendation is to found an association under the foundation of Cleantech Regio. The outcomes of interviews were very wide-ranged but founding an association connects many points which have been given by respondents. These points are considered as instruments. The instruments belong to the main recommendation of an association. The instruments are:

- Network: create a network with memberships for all kinds of parties.
- Connection & Cooperation: support of projects and matching of stakeholders to improve cooperation.
- Events: organization of events with workshops to contribute to knowledge to visitors.
- Koploperproject: a project organized with participating companies, to make clear policies according the implementation of change management to improve circularity.
- Communication: the association can push by having a well working communication system with for example, newsletters.
- Platform: an online platform is desired to share knowledge and keep people up-to-date.

## **SAMENVATTING**

De Nederlandse overheid heeft zich ten doel gesteld om in 2050 een circulaire economie te hebben. Het door de overheid samengestelde rapport hierover ('Nederland circulair in 2050') laat zien dat de samenwerking tussen bedrijven, onderzoeksinstituten en NGO's daarin erg belangrijk is op zowel lokaal, regionaal als nationaal niveau (Netherlands, Nederland Circulair in 2050, 2016). Publiek-Private Samenwerkingen zijn erg gewenst om de samenwerking tussen de pilaren van de Triple Helix goed te laten verlopen. In de Stedendriehoek gesitueerd in Nederland, is een Publiek-Private Samenwerking stichting actief: Cleantech Regio.

Cleantech Regio heeft een beleid gericht op de circulaire economie, echter weten zij niet hoe zij bedrijven kunnen helpen tijdens de transitie van heden naar een circulaire economie en wat hun rol daarin zou kunnen zijn. Om uit te zoeken wat deze rol kan zijn, is er een kwalitatief onderzoek uitgevoerd. De onderzoeksvraag was:

*Wat is de meest efficiënte/ effectieve rol, of combinatie van rollen, voor Cleantech Regio om bedrijven in de regio Stedendriehoek tijdens de transitie naar een circulaire bedrijfsvoering te helpen?*

Tijdens dit onderzoek is gebruik gemaakt van een literatuurstudie en interviews met zowel bedrijven als soortgelijke organisaties als Cleantech Regio. De deelvragen van dit onderzoek waren dan ook:

- Wat voor conclusies zijn er in de literatuur te vinden met betrekking tot hulp, activiteiten en algemene informatie over de circulaire bedrijfsvoering?
- Wat voor hulp wensen bedrijven die geïnteresseerd zijn in een circulaire bedrijfsvoering?
- Wat voor ervaringen er te vinden zijn bij soortgelijke organisaties als Cleantech Regio?

De uitkomsten van de interviews zijn verwerkt via het computer programma Kwalitan. Dit programma is gemaakt om kwalitatieve data te verwerken naar relevante informatie. Het hulpmiddel Codeboom van Kwalitan is gebruikt om alle informatie te structureren. Bij dit structureren ontstonden een aantal categorieën: Overheid, Wetgeving, Circulaire bedrijfsvoering, Educatie, Taken voor Cleantech Regio, Verbinden & Samenwerken en Organisatie & Triple Helix. Alle verkregen informatie was op deze manier te ordenen onder deze thema's. Voor de literatuur werden dezelfde categorieën gebruikt.

Tijdens de analyse werden de gegevens die vanuit de literatuur verkregen waren geconfronteerd met de gegevens uit de interviews. Hierna werd het model van Unilever- "5 Levers for Change" (Unilever, 2011) toegepast. Voor dit model is onderzoek gedaan naar gedragsverandering. Omdat Cleantech Regio het gedrag van bedrijven wil veranderen, is dit model interessant voor het onderzoek. Daarnaast helpt dit model de resultaten te interpreteren.

Als conclusie van deze studie zijn 4 rollen te benoemen, te weten: Verbinder, Aanjager, Inspirator en Kennisdeler. De hoofdaanbeveling is het oprichten van een vereniging onder de Stichting Cleantech Regio. Hoewel de uitkomsten van de interviews waren erg uiteenlopend waren, zal het oprichten van een vereniging veel punten overkoepelen en met elkaar verbinden. Deze punten worden gezien als instrumenten en vallen onder de hoofdaanbeveling. Deze instrumenten zijn:

- Netwerk: het creëren van een netwerk met lidmaatschap en verschillende soorten partijen.
- Verbinden & Samenwerken: opzetten van projecten waarbij stakeholders verbonden worden om de samenwerking te verbeteren.
- Evenementen: organisatie van evenementen met workshops die bijdragen aan kennis van bezoekers.
- Koploperproject: een project waarbij deelnemende bedrijven een veranderend businessplan schrijven ter verbetering van de interne circulariteit.
- Communicatie: de vereniging kan aanjagen door een goed communicatiesysteem. Bijvoorbeeld door nieuwsbrieven rond te sturen.
- Platform: een online platform waarbij kennis gedeeld kan worden is gewenst.

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## GLOSSARY

<b>Association</b>	An organization which consists members and a purpose. Members choose the board and pay contribution (Bos, 2016).
<b>Circular economy</b>	Raw materials are used efficiently and re-used without harmful emissions to the environment. To the extent that new resources are needed, they are extracted in a sustainable manner and prevent further deterioration of the social and physical environment and health. Products and materials are designed so that they can be reused with the least possible loss of value and with no harmful emissions to the environment (Rijksoverheid, 2016).
<b>Circular business</b>	Running a business according to the circular economy definition.
<b>Foundation</b>	An organization to achieve a certain purpose. A foundation can be profitable unless it is used by archiving the goal. The board is the only part that must be present in a foundation (Ensie, 2016).
<b>Koploperproject</b>	A project with 5-10 participating companies. It starts with a sustainability scan, then companies start writing a circularity policy and give a presentation about this during a symposium. A winner will be chosen by a panel of judges (Visser & Smits, 2016).
<b>Respondent</b>	Person who did participate on this research by an interview.
<b>Stedendriehoek</b>	Name of the triangle of cities Apeldoorn, Deventer, and Zutphen.
<b>VNO-NCW Middle NL</b>	The employers'/ entrepreneurs' organization which represents the at meetings of the Strategische Board Stedendriehoek (Regio, Intake with Eddy Tulp, 2017).
<b>Triple Helix</b>	The cooperation between entrepreneurs, education, and government (Regio, Intake with Eddy Tulp, 2017).



## 1. INTRODUCTION

For last decades, the earth's climate has been changing (Change I. P., Headline statements from the Summary for Policymakers, 2014). Agreements of the United Nations Framework Convention on Climate Change (UNFCCC) have forced every government to have an environmental policy. The Dutch government uses the reports of the Intergovernmental Panel on Climate Change (IPCC) for their environmental policy (Netherlands, Klimaatbeleid, sd). The IPCC is assessing the climate change and provides this information as a scientific basis for governments and their environmental policies. These assessments do also serve as basis for the negotiations of the UN Climate Conference – the United Nations Framework Convention on Climate Change (UNFCCC) (Change I. P., IPCC factsheet: What is the IPCC?, 2014).

An important part of the current governmental policy is the focus on the development of the circular economy. The completion of this is described in Appendix I - Information of completion 'The Netherlands Circular in 2050'. The report 'The Netherlands circular in 2050', issued by the Ministry of Infrastructure and Environment and the Ministry of Economic Affairs (Netherlands, Nederland Circulair in 2050, 2016), describes the steps of the Dutch government to achieve a sustainable economy, which should result in a serious reduction of the environmental impact in the future. The report gives a clear definition of circular economy, and this definition will be used during this research:

*"This means that raw materials will be used efficiently in 2050 and re-used without harmful emissions to the environment. If new resources are needed, they will be used in a sustainable manner to prevent further deterioration of the social and physical environment and health. Products and materials are designed so that they can be reused with the least possible loss of value and with no harmful emissions to the environment."* (Netherlands, Nederland Circulair in 2050, 2016)

To meet the conditions of this report, cooperation between the partners in the mentioned process is necessary. Due to chapter 3.4 'Cooperation' of the report 'The Netherlands circular in 2050': it is important that both as private and public organizations will find that common vision to carry out technical, social and system innovations. The crucial cooperation is between companies, research institutes and NGO's: on local, regional, national, and international levels (Netherlands, Nederland Circulair in 2050, 2016).

The Minister of Economic Affairs emphasized that a circular economy is feasible and offers opportunities: *"The ambition of the government is being more effective, smarter and more profitable with the waste streams and scarce resources and do this together with the business community, knowledge institutions and governments. In this way, we are building a circular economy which is not only good yields for our climate, but also income and jobs. Research shows that up to 2023, the circular economy is doing well in the Netherlands, with a market value of € 7.3 billion a year and representing 54,000 jobs. This offers opportunities for our businesses."* (Netherlands, Kabinet: Nationaal grondstoffenakkoord voor recycle-economie in 2050, 2016)

### CLEANTECH REGIO

An initiative has been started in the region of Apeldoorn, Deventer, and Zutphen (shown in Figure 1). An initiative focused on the development of cooperation within the framework of circular economy: Cleantech Regio.

Cleantech Regio is a Public-Private Partnership and Foundation for cooperation of the Stedendriehoek-municipalities Apeldoorn, Brummen, Deventer, Epe, Lochem, Voorst, and Zutphen (Figure 1). It is the aim of Cleantech Regio to cooperate: *"The Cleantech Regio is working together with entrepreneurs, education and research towards an energy-neutral, waste-free, and sustainable economy and society. Economy and ecology go hand in hand."* (Regio, Cleantech Region: towards a brighter future, sd)

The organizational structure of Cleantech Regio is showed in Appendix II – Organigram of Cleantech Regio.



Figure 1- The region of Cleantech Regio with all municipalities and the location within The Netherlands. Source: (Regio, Omgevingsagenda 2.0).

The targets of Cleantech Regio are focussed on emissions, waste, and jobs. This is related to the issues and policy for the change into a circular economy, as formulated by the Dutch government. The targets are meant for this region only. Targets of Cleantech Regio are:

- Future-proof region
  - Energy neutral in 2030
  - Waste free in 2030
- (Board, 2017)

The cooperation between entrepreneurs, the education sector, and local government, as stated in the definition of Cleantech Regio, is called the Triple Helix principle.

1. The **entrepreneurs** of this region are represented by the VNO-NCW Middle NL. This employer organization represents the bigger companies in of the region during meetings of the 'Strategische Board Stedendriehoek' (Regio, Intake with Eddy Tulp, 2017).
2. The **education sector** institutes consist of Aventus (secondary Vocational Education and Training) and axion University of Applied Sciences. Aventus is situated in all big cities: Apeldoorn, Deventer and Zutphen and Saxion is situated in Apeldoorn, Deventer, and Enschede (Regio, Intake with Eddy Tulp, 2017).
3. The **governmental** part consists of the municipalities. The concerned municipalities in the Gelderland-area are Apeldoorn, Brummen, Epe, Lochem, Voorst, and Zutphen. Deventer is in the province of Overijssel (Figure 1) (Regio, Intake with Eddy Tulp, 2017) (Regio, Omgevingsagenda 2.0).

Cleantech Regio is based on the cooperation between public and private organizations in a certain area and has called the following groups to stimulate cooperation in the region:

- **Strategische Board Stedendriehoek** (English: Strategic Board Triangle of cities). It is founded in 2012. This board works according the Triple Helix principles and during the meetings of this organization the three helixes are represented. Cooperation is the aim of this group.
- **Wgr-regio Stedendriehoek** (indicated as Wgr) (English: Joint Arrangements Act triangle of cities region). It is the group of municipalities. For years, these municipalities have been working together because together they can reach more than alone. For example, in conventions of provinces, government, and

Europe. The region has formulated an ambition to be energy neutral in 2030. Cleantech Regio is founded by the cooperation of Wgr-regio Stedendriehoek.

Cleantech Regio owns one executive office of the organization which operates the support for companies: 'Cleantech Regio Development' (CTRD). This part started to operate in June 2016. Furthermore, CTRD assists companies in changeover/start-up. They are mostly interested in companies which are considering changing towards a circular business management. CTRD focuses on among others at chain formation in production processes (symbiosis between companies) and energy (Regio, Intake with Eddy Tulp, 2017).

### 1.1. PROBLEM STATEMENT

As described in previous section, the aim of the policy of the Dutch government is focused on the change of linear economy towards a circular economy. One of the targets of Cleantech Regio is in common with this. To reach this goal, among other things, companies should produce products with a long life-time and require a design that allows the reuse (or recycling) of materials with no loss of value and without harmful emissions (Netherlands, Nederland Circulair in 2050, 2016).

Erick Wuestman (expert on circular economy value engineering and chairman of Foundation Circular Economy) notes that it is the task of the government to stimulate companies to come with some innovative and circular solutions. He also noted, that municipalities would like to support this transition, but do not know how to do this (De Vries, 2017).

Cleantech Regio, as a public-private partnership, could help companies which are starting or changing towards a circular business. The problem is that this opportunity of Cleantech Regio is not in use by companies. Neither they are changing in other ways towards circular businesses. It does not matter *how* companies are changing, but *that* they are changing (Regio, Intake with Eddy Tulp, 2017). Cleantech Regio is not familiar with supporting companies (Regio, Intake with Eddy Tulp, 2017) and the companies may not know how they could do the change management. Companies may even withdraw because of the obstacles they meet.

Professor Jan Jonker of Radboud University Nijmegen did research to the state of affairs concerning the introduction of circular principles in business in East Netherlands (Jonker, Stegeman, Faber, Kothman, & Janssen, 2016) and notes that just a few, 8 companies, within the region are seriously about the transition to circular business (Regio, Intake with Eddy Tulp, 2017). This example describes the problem: Cleantech Regio is familiar with the companies, but is not supporting them during the transition (Regio, Intake with Eddy Tulp, 2017).

A research which is described in the book: 'Circulaire Economie' (De Ritter & Bet, 2016) shows that educational institutes, governmental institutes, and private institutes are facing serious obstacles during the transition to a circular economy. This research, which has been carried out at national level in The Netherlands, results in the identification of the following obstacles:

- Financial risks: the investment is high and it leads to a wait and see attitude.
  - Lack of cooperation within and between organizations: some knowledge is lost in different departments. And organizations do not know if there is interest in parts of the production chain, this knowledge is, mostly, not shared.
  - Less attention in education: the topic of circular economy is not threatened sufficiently; Universities of Applied Sciences are teaching it as a minor but as the major part of a study.
  - The role of the government and regulations: not enough support by the government and awareness of the citizens.
  - Lack of decisiveness: companies know that the time of discussing is done, it is time to operate but they find it hard to agree with all the employees.
- (De Ritter & Bet, 2016)

It is assumed that the incentives of companies, to change their business into circular business, are hampered by some of the identified obstacles. These obstacles are known at national level (De Ritter & Bet, 2016).

Although Cleantech Regio has a policy towards a circular economy within the region, they do not know how to support the participating companies and what their role might be.

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#### 1.1.1. RESEARCH AIM

To find out what the role and policy of Cleantech Regio could be, a research was carried out, focused on the evaluation of the role of Cleantech Regio into the transition process of participating companies and to compare the results of this evaluation with the outcome of similar transition processes in other, similar, regions.

The best role might be reached when the policy of Cleantech Regio takes the mentioned obstacles into account. In this way of thinking it was assumed that the companies within the region of Stedendriehoek experience the same obstacles as the companies at national level.

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#### 1.1.2. RESEARCH QUESTIONS

Main question:

*What is the most efficient/ effective role or combination of roles for Cleantech Regio in supporting companies within the region of Stedendriehoek in transition towards a circular business?*

Sub questions:

1. What conclusion can be drawn from literature related to roles and activities of certain organizations and general information about the transition towards a circular business?
2. What kind of support is desired by companies which are interested in circular business?
3. What are the experiences with support of companies of similar organizations in other regions of The Netherlands?

## 2. RESEARCH DESIGN

The research design gives a description of the entire operative processes. It is divided into section Research population, Research method, Data collection Method, Data processing method, and Data analysis. All sections are describing the steps which have been followed during this research.

### 2.1. RESEARCH POPULATION

The population of this research is divided into 3 populations: literature, companies, and similar organizations.

#### LITERATURE

Recently, little research has been carried out on roles and activities of certain organizations and general information about setting up a circular business. The population in this sub question consisted of all written sources that answer the question: 'What conclusion can be drawn from literature related to roles and activities of certain organizations and general information about the transition towards a circular business?'

The population existed of all sources. Only a selection of sources is used for this research however. Sources were selected if they took a part of the sub-question into account. The reason of selection is mentioned behind every source below. The following sources were considered as useful for this research:

- *The role of Nature and Environment Federation Drenthe, in promoting local sustainable energy initiatives* (Thesis research) Janneke Wolkorte (Wolkorte, 2012). Selected because research to roles of certain organization.
- *De kracht van duurzaam veranderen* (Book) Anne-Marie Rakhorst (Rakhorst, 2012). Selected because description of governmental support.
- *'5 Levers for Change'* (Model described in document) Unilever (Unilever, 2011). Selected because it has a link to Cleantech Regio's first steps according support companies.
- *Advise to municipality of Ameland on how they can best facilitate entrepreneurs in sustainable entrepreneurship* (Thesis research) Joost Smits & Bauke Visser (Visser & Smits, 2016). Selected because description of governmental support.
- *De transitie in arbeid en scholing voor een circulaire economie* (Document) SER: Dutch Social-Economic Council (Development, 2016). Selected because description of educational support.
- *Sluiten van kringlopen creëert waarde* (Website with interview) Jan Jonker (Kraay, 2017). Selected because description of support.
- *Circulaire Economie* (Book) Monique de Ritter & Bram Bet (De Ritter & Bet, 2016). Selected because many circular essentials are mentioned in this book.
- *Ondernemen in de Circulaire Economie* (Report) One Planet Architecture Institute and MVO Nederland (Schoolderman, et al., 2014). Selected because it is about the principles of a business in a circular economy.
- *Guided Choices Towards a Circular Business Model* (Report) One Planet Architecture Institute (Joustra, de Jong, & Engelaer, 2013). Selected because all steps to change into a circular business are described.
- *Herooverwegen van vooruitgang: de circulaire economie* (YouTube clip) Ellen MacArthur Foundation (Foundation, 2012). Selected because it is about the principles of a circular economy.

## COMPANIES

To answer the question: ‘What kind of support is desired by companies which are interested in circular business?’, companies were the population. For this research, only companies which were interested and were doing something in the field of circular business were useful. These companies were familiar with the support they needed during the transition.

The selection criteria were:

- Companies which are interested in circular business
- Companies which are changing into circular business
- Companies which are having (almost) a circular business

The companies which matched with the mentioned criteria, were already known by Cleantech Regio due to the research of Professor Jan Jonker (Jonker, Stegeman, Faber, Kothman, & Janssen, 2016). The selection was based on this research. It contains the following companies:

- Royal Auping: bedroom furniture designer and producer situated in Deventer and worldwide delivery
- Foenix: second hand shop situated in Apeldoorn
- Roelofs: infrastructure and building contractor situated in Den Ham
- Dijkshuis: building contractor situated in Hardenberg
- Kimenai (found by network of researcher): HVAC/ heating/ plumbing/ electrical contractor situated in Lochem

6 respondents participated to this research. 5 companies were represented.

## SIMILAR ORGANIZATIONS TO CLEANTECH REGIO

The population of similar organizations consisted all similar organizations to Cleantech Regio. Cleantech Regio is an organization which operates together with *“entrepreneurs, education and research towards an energy-neutral, waste-free, and sustainable economy and society.”* (Regio, Cleantech Region: towards a brighter future, sd) The research condition was that the similar organization must have a similar aim. Only organizations with the same aim were selected for this research.

The similar organizations were found by research at the world-wide web. The organizations which were found are:

- Circular Friesland: association for cooperation between companies, education, organizations, and government situated in province of Friesland (Friesland, 2017)
- Amsterdam Smart city: innovation platform for businesses, residents, municipalities, and knowledge institutes (SmartCity, sd)
- Municipality Ooststellingwerf: a municipality with aim to be sustainable before the year 2030.
- Clean Tech Delta: a cooperative association for cooperation between universities, knowledge institutes, cities, and companies (Delta, sd).

These organizations corresponded to the research conditions. 4 respondents participated in this research. One of them did participate through a Frequently Asked Questions document.

## 2.2. RESEARCH METHOD

The research design which was used for this research is the qualitative research. Qualitative research aims at information that is important to a certain target group and finding out why that information is important (Marktonderzoek, sd). The research was based on the book Basisboek Kwalitatief onderzoek (Baarda & Bakker, 2013).

Since this research was a qualitative research, different types of research designs are used. The methods which have been used were literature research, semi structured interviews with companies, and semi structured interviews with similar organizations.

## 2.3. DATA COLLECTION METHOD

This section describes the collection method, applicable for the different methods which have been used: Literature research, Semi structured interviews with companies, and Semi structured interviews with similar organizations.

### LITERATURE RESEARCH

The literature sources served as inspiration and provided theoretical knowledge about the transition towards circular economy. In the end 9 sources were consulted. All sources were consulted on relevant information for this research.

### SEMI-STRUCTURED INTERVIEWS WITH COMPANIES

During the interviews with companies, the researcher asked certain questions to clarify the wishes of companies according support they could need. The interviews were semi structured During semi structured interviews, it is possible to get more in to the details. A list of questions was available, but when the interviewer wanted to know more about a specific topic, it was possible to ask about that. The interviews with companies were all face-to-face and (audio) recorded.

The interview questions are attached in Appendix III – Interview questions companies (English) or for Dutch: Appendix III – Interview questions companies (Dutch). The interviews were focussed on the themes and obstacles of the book Circulaire Economie (De Ritter & Bet, 2016), which is mentioned in the Problem Statement:

- Introduction
- Finance
- Cooperation
- Education
- Government & legislation
- Perseverance
- General

The interview was separated into these themes. These themes contained questions about the obstacles the companies experience and what solutions are desired.

The interviews were kept in Dutch because this is the mother tongue of the interviewer, and respondent.

The interviews with companies took place from the 27<sup>th</sup> of March 2017 until the 16<sup>th</sup> of April 2017.

### SEMI-STRUCTURED INTERVIEWS WITH SIMILAR ORGANIZATIONS OF CLEANTECH REGIO

The interviews with the similar organizations were aimed at getting information about supporting companies during the transition. The interviews were semi structured, face-to-face, and (audio) recorded. These interviews



were also kept in Dutch. The questions and topics for these interviews are attached in Appendix IV – Interview questions similar organizations (English) or for Dutch: Appendix IV – Interview questions similar organizations (Dutch). The interviews were also focussed on the themes of obstacles which are known by the book *Circulaire Economie* (De Ritter & Bet, 2016) and are mentioned before. One topic was added: incentives for companies. The interview therefore was separated into the following topics:

- Introduction
- Incentives for companies
- Cooperation
- Education
- Finance
- Government & legislation
- Perseverance
- General

The interviews with similar organizations took place from the 17<sup>th</sup> of April until the 14<sup>th</sup> of May.

#### 2.4. DATA PROCESSING METHOD

The conclusions of the literature research are listed in Chapter 3: Results of literature. An overview of all results is given, together with a review of all conclusions.

The transcripts were made of interviews. Because the research is a qualitative research, all interviews were transcribed literary. This happened right after each interview. Because the transcripts are big documents with mostly irrelevant information, they are in an external appendix containing these documents. The transcripts were converted into relevant information for the research. The conversion was done by the Dutch computer programme Kwalitan. The next sections describe how this conversion was done.

##### CODING OF RELEVANT INFORMATION

All transcripts of semi structured interviews with companies and similar organizations were analysed by the Dutch programme Kwalitan (Kwalitan, 2016). The transcripts were saved as Microsoft Word documents. They were converted into a txt-files (.txt) before opening in Kwalitan. Only these kinds of files can open in the programme Kwalitan. After all transcripts were opened, the segments were made. Segments are parts of an interview, wherein the topics of questions belong together. The segments which were made also connect to the topics of the questions: introduction, cooperation, government & legislation, education, finance, perseverance, and general. Each interview was divided into these segments. After that, the coding was started. The researcher gave codes (: coding) to answers of all respondents. Codes are short and combined words which give information about the answers that are given during the interviews. The book of Baarda & Bakker (Baarda & Bakker, 2013) gives a description of coding: *“A code establishes the link between the empirical material (the words of the respondent) and the conceptual framework, the interpretative framework of the researcher.”* Since the interviews were in Dutch, the codes were in Dutch as well.

##### TREE-STRUCTURE

After the codes were given by the researcher, the programme helped to get an overview in all different answers which were given. The codes were merged by organizing and searched for cohesion. The method which have been used is the tree-structure (Kwalitan, 2016). The associated codes were classified into categories.



## 2.5. DATA ANALYSIS

The analysis describes the process from results to conclusion. This section describes how this process was done.

### COMPARISON

During analysis, the results of literature were compared to the results of interviews with companies. This was done in Microsoft Excel. Only matching codes were mentioned, since these were considered as relevant for this study. The tree-structure was used to organize and to match codes. This tree-structure let to slightly different themes. These themes were made by connecting the matching topics and call them a name. The themes by tree-structure are:

- Government
- Legislation
- Circular business
- Education
- Tasks for Cleantech Regio
- Connection & Cooperation
- Organization & Triple Helix

Table 1 was used for the comparison of all results. The categories of the tree-structure were shown as 'outcomes', the concerning codes were filled in under each category, and in next columns an overview of sources and respondents were shown. Organization & Triple Helix was merged with Connection & Cooperation since this theme did not have related topics in literature.

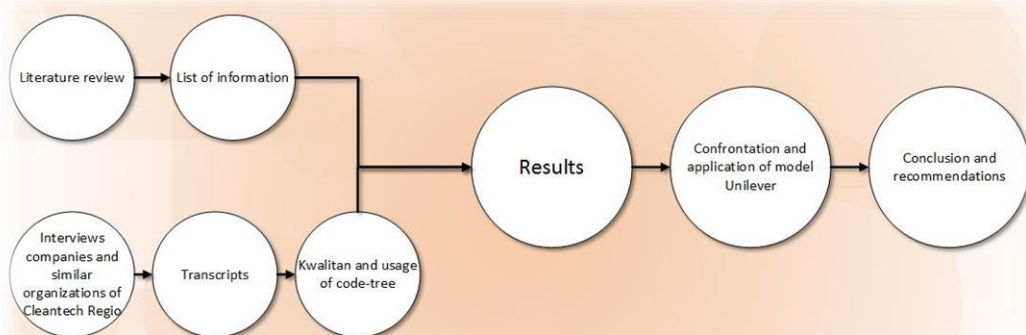
<b>Outcome</b>	<b>Source</b>	<b>Respondent</b>
<i>Government</i>		
<i>Legislation</i>		
<i>Circular business</i>		
<i>Education</i>		
<i>Tasks for Cleantech Regio</i>		
<i>Connection &amp; Cooperation</i> <i>Organization &amp; Triple Helix</i>		

**Table 1- Table for analytic comparison of results interviews and literature.**

### 5 LEVERS FOR CHANGE OF UNILEVER

Unilever developed a model to change people's behaviour: '5 Levers for Change'-model of Unilever (Unilever, 2011). The model was found in literature research and is very applicable for this study. The model was used to analyse the results into a clear plan, which results into a change of company's behaviour. The second part of the analysis was to fill in this model and apply it to this research. The document belonging to this model describes step by step how to change the behaviour. A short overview of this document is given in Chapter 3 Results Literature.

Figure 2 shows the entire process which is followed for this research.



**Figure 2 – The executed steps for this research.**

### 3. RESULTS LITERATURE

This chapter gives an overview of all conclusions which have been found in related literature. The used sources are divided over different titles. In the last section, an overviewing list of topics is shown.

#### 3.1. SOURCES

The sources were used for this research were selected because they contain information about roles and activities of certain organizations and general information of supporting companies in transition towards a circular business. Every section gives a summary of all relevant information which is found in that source.

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##### RESEARCH JANNEKE WOLKORTE

The main question for this research is: *‘What is the current situation concerning the local energy companies and relevant stakeholders in the province of Drenthe and which roles can the Natuur en Milieufederatie Drenthe (Federation for Nature and Environment) take in order to stimulate (the establishment of) local energy companies?’*

Different roles came out of this research: supporter, connector, ambassador, and driver/inspirer. These roles have all their own activities. For example: organizing meetings, organizing cooperation sessions, sharing knowledge as information documents, connecting experts to initiatives, scheduling of local sustainable energy initiatives on the municipal agenda, and inspiring of people (Wolkorte, 2012).

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##### BOOK ANNE-MARIE RAKHORST ‘DE KRACHT VAN DUURZAAM VERANDEREN’

Anne-Marie Rakhorst gives suggestions to the Dutch government according the topic: ‘The power of sustainable change’. The Netherlands have much potential to become the first country to apply the circular economy. *“The Netherlands must be a pilot for Europe, when it comes to circular business”*- Anne-Marie Rakhorst (Rakhorst, 2012). She gives three other kinds of suggestions:

- All governmental organizations must do their invitations to tender ‘green’. They must work according ecological and social innovation and it needs to be transparent (Rakhorst, 2012).
- Developing of a resource agenda. The government must think about the raw materials. They should think about the usage of raw materials in 2020, how it is needed and how it will be affordable (Rakhorst, 2012).
- Raw materials made of waste must be tax free. The Netherlands could be the first country where raw materials made of waste are tax free. It will stimulate more countries and all sectors (Rakhorst, 2012).

Also, the book states: *“We all have an important role. Not only companies, but also consumers and the government. In the end, the cooperation between all these parties will give a surprising and sustainable organization of society. The companies are challenged to produce sustainable products with high quality and competitive price. The consumers take these products as a reward. The government should set guidelines to make it all possible, and take an exemplary role. For instance, purchase sustainably”* (Rakhorst, 2012). In her opinion, the companies are the base for sustainable change.

Chapter 4 of the same book says that leaders are necessary for transition. *“Leaders can inspire and give a direction to the future. They inspire less developing organizations and even convince entrepreneurs and managers who do not know the power of sustainable entrepreneurship.”* (Rakhorst, 2012)

### '5 LEVERS FOR CHANGE' OF UNILEVER

In the same book, the model of Unilever is described. This model is called 'Five Levers for Change'. It is meant for companies to make consumers better aware and facilitate sustainability (Rakhorst, 2012). Five steps: make it understandable, make it simple, make it desirable, make it worthwhile, and make it a habit. This model is shown in Figure 3. The model is applicable to virtually all changes since Unilever did research into people's behaviours. The model explains: *"Barriers – what are the things that stop people from adopting a new behaviour? Triggers – how could we get people to start a new behaviour? Motivators – what are the ways to help them stick with the new behaviour?"* (Unilever, 2011)

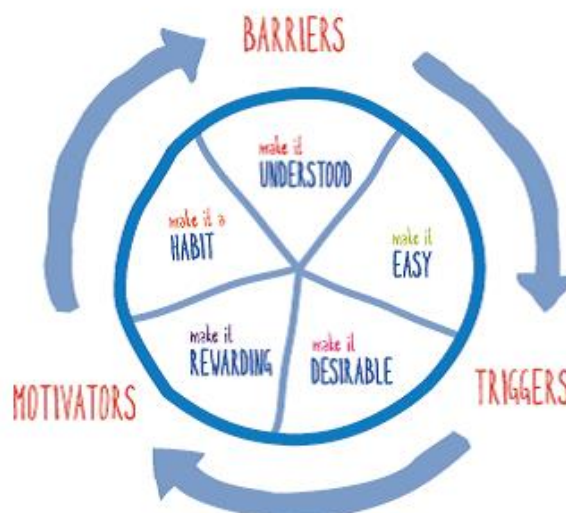


Figure 3- 'Five Levers for Change' of Unilever. (Unilever, 2011)

### RESEARCH JOOST SMITS & BAUKE VISSER

The main question of this study was: *"What is the best way for the municipality of Ameland to facilitate in the process of the entrepreneurs of Ameland to participate in CSR, and gain the 2020 ambition, and is this achievable?"* (Visser & Smits, 2016)

The recommendations of this study where:

1. Continue of the current 'Energieloket' (English: Energy counter). By hiring an external person, it is possible to give independent advice to the entrepreneurs and inhabitants of Ameland (Visser & Smits, 2016).
2. Setting up of a 'Koploperproject' (English: Forerunner project), where several entrepreneurs of Ameland are working on the integration of CSR (Corporate Social Responsibility). In this case, it is the task of the municipality to finance, communicate, and organize the project. An amount of 5-10 companies are participating this project. First, a sustainability scan takes place. Second, participants give a presentation about their sustainability. After that, all participants are writing an environmental policy and plan. These plans are shared together. In the end, a symposium takes place. During this symposium, all outcomes are presented and other companies will be inspired by success of others. A winner will be chosen by a panel of judges (Visser & Smits, 2016).
3. Investigate the options to give loans to the entrepreneurs for taking energy saving measures (Visser & Smits, 2016).

### REPORT OF SER

The document, written by the SER (Dutch Social-Economic Council) also concerns about the topic of circular business. *"Inspiring leadership is an important factor in the business direction of circular business to get moving and to keep and to overcome obstacles."* (Development, 2016)

This document also highlights the importance of the topic circular economy in education. Page 25 describes that many educational institutes do have attention for aspects of nature, environment, and sustainability. However, only a few schools are familiar and systematically work with the topic of sustainability. So is the (new) topic of circular economy (Development, 2016). 'Groene Brein' (Development, 2016) gives a few recommendations to the government:

- Highlight the wanted theme of circular economy of companies and organizations (Development, 2016).

- Show the 'Koplopers' (English: Forerunners) in education and share practical examples (Development, 2016).
- Create a relation between people, initiatives, and organizations by investing together in knowledge and targeted support (Development, 2016).

In addition, the document highlights the importance of organizations like Cleantech Regio. SER states that the higher educational institutes must focus more on Triple Helix like principles (Development, 2016).

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#### WEBSITE WITH INTERVIEW JAN JONKER

The opinion of Jan Jonker is stated in an interview with Nicolette Kraay. He says that it is important to take time during the plan phase: *"let's put time in the concretization of plans."* (Kraay, 2017). In his opinion, the government should take care of the facilities, like taxes, regulations, and a financial model. Also, he stated that it might be good when the government updates the NEN-standards (Kraay, 2017). For example, the NEN provides ISO-standards like ISO 26 000 which is about CSE and sustainability for companies. It can provide support for companies (NEN, 2017).

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#### BOOK MONIQUE DE RITTER & BRAM BET

The book of 'Circulaire Economie' explains both obstacles and opportunities to realize a circular economy. It describes a research during educational institutes, governmental institutes, and private institutes were interviewed and came with solutions for solving the obstacles. 5 themes are named: government stimulation, improvement of cooperation, awareness, convincing people within organizations of the necessity, and Buyer-power (De Ritter & Bet, 2016).

##### *Stimulation from the government*

All three sectors are pointing at the role of the government. The government could subsidize SME's and consumers for buying solar panels. One outcome is that the politic urgents is not high enough, for example when it comes to solar energy. This sector is a success but due to politics the use of solar panels is not common enough yet (De Ritter & Bet, 2016).

In addition, the legislation could also play a role in stimulating companies to become more circular (De Ritter & Bet, 2016).

##### *Improvement of cooperation*

The cooperation must be doing well when creating a circular economy. All sectors agree with this. Some respondents even say that public-private partnership could have a role in working together towards a circular economy. Mostly, well-developed companies (of circular economy) are stimulating the non-developed companies. (De Ritter & Bet, 2016)

##### *Awareness*

Like society itself, must become more aware of the circular economy The educational institutes must pay more attention to circular economy so students can do more projects for companies which is cheaper for companies (De Ritter & Bet, 2016).

##### *Convincing people within organizations of the necessity*

Another improvement is the conviction of circular economy within organization. It should be visible in more layers and departments of organizations. For example, all departments should have some space for

brainstorming about sustainability within the organization. Also, sustainability must be more taken account during building projects (De Ritter & Bet, 2016).

#### *Buyer-power*

When a bigger enterprise wants to demand a sustainable product in large volume, it can lead to the production of this new product if there is enough demand to it. When a small enterprise demands the same product, it will lead to less product developing. The more demand, the bigger the chance a company will produce this product (De Ritter & Bet, 2016).

The conclusion of this study is that the financial risks are too high and this could be solved by optimising cooperation and government stimulation. Also, when the government applies instruments like subsidies, fines, and discounts, the financial risks would be smaller and the chance of innovation bigger. Cooperation will also decrease the financial risks (De Ritter & Bet, 2016).

The second important instrument would be the role of the education. More attention for circular economy within the education could lead to a higher awareness (De Ritter & Bet, 2016).

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#### REPORT OF ONE PLANET ARCHITECTURE INSTITUTE AND MVO NEDERLAND

*“To beat the crisis of systems, system innovation is necessary. Like during all innovations, out-of-the-box thinking, cooperation, and leadership are necessary elements. According to thinking in a circular way, operating in value chains is the indication. It asks many of the entrepreneurs: a future-oriented view and cooperation in the chain and direction.”* – Wiebe Draijer (Schoolderman, et al., 2014).

When developing a circular economy, is operating in terms of usage more useful than operating in terms of consumption. It asks for changes of businesses and the way of developing products or services. The relations between customers, appliers, distributors, financers, and shareholders are reorganized. In the circular chain, there is no place left for the take-make-dispose principle. Competitors can work together towards a circular system. In the developing phase of a product the reuse and next cycle are though about. But still, it is hard to think in functionalities instead of products. If the third company in chain is changing into circular business, but the consumers may not ready (yet) to buy the product (Schoolderman, et al., 2014).

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#### THE DOCUMENT OF ONE PLANET ARCHITECTURE INSTITUTE

The document ‘Guided Choices Towards a Circular Business Model’ provides all steps companies can take towards a circular business. According this document, the first step is to understand the principles of a circular economy (Joustra, de Jong, & Engelaer, 2013). The basic of a circular economy is visible in the butterfly diagram of the Ellen MacArthur Foundation which is shown in Appendix V – Butterfly diagram Ellen MacArthur Foundation. It says that it is as well important to maintain, reuse, remanufacture, and recycle products. It is not preferable to recover energy by incineration, or to landfill waste because these purposes are not circular: the product itself is gone (Foundation).

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#### CLIP OF ELLEN MACARTHUR FOUNDATION

The YouTube clip of the Ellen MacArthur Foundation shows the circular economy concerns to not be ‘owner’ of products, but be ‘leaser’ of products. This example is an instrument of realizing a circular economy. The maker of the product is responsible for his/her own waste and will create new products of it (Foundation E. M., 2012).

### 3.2. OVERVIEW

An overview of all literature outcomes is given below. The outcomes are divided over all themes. The topic of Organization & Triple Helix is merged with Connection & Cooperation since this topic did not have related topics as outcomes of literature review.

#### *Government:*

The government must have a more long-term vision, as well as an exemplary and facilitating role. In addition, the invitations to tender must be sustainable based.

#### *Legislation:*

The government must enforce the law. It might also work to add the Carbon taxes to stimulate innovation.

#### *Circular business:*

The essentials of a circular economy or circular business contain a high supply and demand of circular products. The circular economy is also familiar by the principles of a 'borrow economy'. Within this 'borrow economy', people are not owners of products anymore.

When running a circular business, it might work to involve employees to higher their awareness. The government could add subsidy at circular initiatives, which is necessary.

#### *Education:*

Literature sources agree that education is important. It could also increase the awareness. The themes of studies must link to the demand of students. And students can work on real case projects in cooperation with companies.

#### *Tasks for Cleantech Regio:*

According Cleantech Regio, different roles and tasks came out of literature: Pusher, Inspirer/ Convincer, Connector, and Knowledge sharer. Some tasks are the Koploperproject (English: Forerunner project), inspiring of society, convincing within companies, online platform to share knowledge, and creation of demand.

#### *Connection & Cooperation and Organization & Triple Helix:*

Cooperation is very important. Cleantech Regio could organize sessions agreeing cooperation. The three pillars of the Triple Helix must be involved. Clear plans will improve the cooperation.

## 4. RESULTS OF INTERVIEWS

After the interviews had taken place, the transcripts were made and the results were processed in the computer programme Kwalitan. This programme makes it possible to analyse data and add codes to what is said. These codes were added in a 'code tree', so each code was connected under a topic. These topics were the same as mentioned before: government, legislation, circular business, education, tasks of Cleantech Regio, and connecting & cooperation. This chapter will go into what is said during the interviews. All topics are divided into sections, in these sections some quotes or paraphrases are given to make clear what the respondents did say. A reference is given after each quote or paraphrase. This is to know what kind of respondent is quoted. The respondents with numbers (1,2,3,4,5) have an origin in companies and the respondents with letters (A,B,C,D) have an origin in similar organizations of Cleantech Regio.

### 4.1. GOVERNMENT

The Dutch government must show that circular economy is a great opportunity for the economy (External appendix, respondent B). The general experience with the government is very bad. Many respondents gave their experiences, one of them summarized it well: *"the civil servant is punished by the accountants of the government. So, he can only work according the rules. And everything that goes wrong, is punished. So, they are hiding all on each other to lower the risks. In that kind of culture, no circular economy is possible"* (External appendix, respondent 2). It leads to very poor cooperation with governments.

Also, the government does still thinks too much in money-wise according to some respondents. Their investments are never done with a long-term-vision. However, when doing investments with long-term-vision, it will automatically yield money in the end (External appendix, respondent C). Many respondents are in agree with literature: the government needs to serve as good example for the community. The governments are customers too, for many companies. That links with the long-termed vision as described above.

The government can have a facilitating role, for example by funding (External appendix, respondent 1). Facilitating can also be a supporting role, or making things easier, in agree to the acceleration of the transition.

Respondent 3 (External appendix) gave an advice when cooperating with government or educational institutes: *"I learned this: when you are talking with them, you should make some clear appointments. This time you make an appointment with someone of the municipality, but the next time you will meet another person of the same municipality. For me, it is all 'the municipality'. So then you are right to say: 'no, we agreed this and now we will talk about something else.' Those criteria must be clear."*

### 4.2. LEGISLATION

This section is going into topics of specific legislation which form a barrier to the transition and the solutions.

#### 4.2.1. LEGISLATION BARRIERS

The question: 'does legislation work well with the transition?' is answered with 'no'. To specify this answer, the researcher has asked the respondents which legislation is working against the transition towards circular economy. The answers were: Waste Disposal Act, Building materials decree, and Procurement Law. *"An example is roadside mowing hay. If you want to apply roadside hay to a bio-based product, you need to be accord with different licences. Because you do work with waste. And if you do work with waste, you need to have facilities for having these licences. (...) how polluted is roadside hay at all?"* (External appendix, respondent 5).

The decree on Building materials is based on TNO-reports. Since TNO is not always familiar with recycled building materials, it is not applied in the decree (External appendix, respondent 2).



The Procurement Law carried out in a way that the invitations to tender are always dependent on costs. In the end, costs are the leading factor in doing investments (External appendix, respondents 2 and 5).

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#### 4.2.2. SOLVING LEGISLATION PROBLEMS

The respondents gave different solutions. Green Deal is a well working instrument to minimize the delay. One disadvantage which comes up after a fortunate pilot project of Green Deal is when multiplying the project: *“when you want to apply it in other regions, you still got the legislation against it. In that sense, it is great to start and succeed pilots with Green Deal, but it needs to be figured out before multiplying again.”* (External appendix, respondent 5)

Another solution for legislation is the Best Available Techniques. It is required for companies who have enough sales volume, to do investments for Best Available Techniques (External appendix, respondent 4). It might not be a solution to solve legislation problems, but in opinion of one respondent it is a good instrument to accelerate the transition. It relates to the next solution: enforcing law. Some respondents do agree enforcing law is necessary for transition and change of laws. It is not desired to be more lenient about enforcing law, but it is more efficient than leaving the choice to companies. Some respondents agree with the idea of Carbon-taxes: *“it will support the circular economy when the government adds Carbon-taxes. They really need to do that, it will work.”* (External appendix, respondent 1). Respondent D (External appendix) said: *“Yes, in the end it is necessary. Something needs to change, Carbon-taxes is an example of the first step. Even though the behaviour needs to change.”*

#### 4.3. CIRCULAR BUSINESS

This section is separated into sections: incentives, barriers, finance, and essentials of circular business.

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##### 4.3.1. INCENTIVES

Incentives to start or change into a circular business are found as well. First, many family businesses have an important incentive to change their business. They transfer their business to the next generation although the commodity prices are fluctuating (External appendix, respondent B). Another incentive to get sustainable is given by the next quote: *“it is an incentive for companies to be less vulnerable or even independent on others.”* (External appendix, respondent D)

The next quote of respondent D (External appendix) also describes the incentive for some companies: *“We also say: you are now able to make choices and choice for it. In the future, you would not be. In the future, you must do it without any space. Then I say: you can now lead the way. And the companies think that is an important argument.”*

Another interesting part is that companies who made the decision to become circular and in fact, lead the way, are going to get more publicity: *“Circulair Friesland works with these leading projects. Those projects seem to be very small, but because of bigger cooperation, it leads to start turning the flywheel-effect. Positive energy and publicity will attract more parties.”* (External appendix, respondent B).

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##### 4.3.2. BARRIERS

The respondents also came up with many barriers when started their circular businesses:

- Developing materials is essential for building and civil businesses. They need to develop usable bio-based or circular materials. The barrier is that some pilot materials are created, but not tested. Before usage, they never know the product features (External appendix, respondent 5).



- Awareness, conviction. *"... people need to be convinced by the utility."* (External appendix, respondent 4).
- Suppliers do not feel responsible. Most of the companies are dependent on suppliers. If they do not produce circular (raw) materials, the company can never be circular (External appendix, respondent 4)
- The conviction must be sincere. *"It needs to be sincere. Because I note, when companies are doing it just because of marketing, it would not work."* (External appendix, respondent 2)
- The products become more expensive (External appendix, respondent 4).
- Awareness of employees. Not all employees do understand why the circular economy is important (External appendix, respondent 2)
- Carry through is hard for leaders because they are the only ones (External appendix, respondents 2 and D).
- The linear economy is focussed on money and costs, people must be more open-minded. *"Well, the economy is focussed on prices. But what you should do is not taking finance only as money and costs, but search for what kind of positive advances it has next to that. It might be so that a province or municipality is benefited from employment opportunities. And the experience of inhabitants, so more flowers, biodiversity. But that is not expressed in money when they do their invitations to tender."* (External appendix, respondent B)
- Becoming circular as a company is never easy. It is a big project which takes years and every step which is taken will lead to a step backwards too (External appendix, respondent 1).
- Saturation of residual streams is happening right now. This is because of many businesses become more sustainable (External appendix, respondent 1). New products can be made when everybody recycles their residual streams. But this solution is not popular nor developed yet.

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#### 4.3.3. FINANCE

*"Whether you like it or not, the transition costs money."* (External appendix, respondent 1). In multiple topics, money came out as a barrier or as a decisive problem. This also applies to the governmental invitations to tender, the market, and the investments. Sometimes, different parties are planning to start a project or pilot. In these cases, it is hard to decide who is going to carry the investment (External appendix, respondent C). Investors are sometimes important, and in some cases funding is needed. Different respondents agree that funding might solve problems. Cleantech Regio could provide some funds for innovation (External appendix, respondents 1 and 3), or they can say: *"you are going to make products in a right way which is according to the circular economy. The government will be your first customer. (...) I need to be sure to have some customers."* (External appendix, respondent 3).

Subsidize is also a way of funding. Respondents do see chances in initiating this. But the government cannot subsidize all of it. Till now, no subsidies are available for entrepreneurs (External appendix, respondent C and D).

Some respondents do think in a different way about funding and the neediness *"Believe: it will yield you in the end. We now see it is yielding since we have developed a new business model."* (External appendix, respondent 1). It all starts with a clear plan. So not all respondents do agree with the importance of funding.

It is necessary to stay focussed and time is necessary to get familiar with some changes (External appendix, respondent 1). *"The positive incentive to start a circular business is that everything we throw away, in waste, costs us money. And you throw away valuable materials. Those materials could yield you money if you recycle those."* (External appendix, respondent 3).

#### 4.3.4. ESSENTIALS CIRCULAR BUSINESS

Many respondents said awareness is an essential part for having a successful circular business. As well for education (External appendix, respondent 2), companies (External appendix, respondent 2) as for the entire country, awareness is an important factor. The government could make citizens more aware (External appendix, respondent B). Higher education will teach students to be aware of earth's climate and inspiring directors of companies could make employees more aware of human effects.

By this, employees of companies might start thinking of solutions for circular economy and it will help organisations become more circular. This factor is said as well during interviews: involve employees. Some companies organize events for employees so they can all brainstorm about circularity within the company. Then, the results are collected and those will be included in the new plan of the company (External appendix, respondent 3 and 5). Other companies are working with a project team for circularity where CEO, circular project manager, project developers, and maintenance managers are involved. Those are bigger companies (External appendix, respondent 1 and 5)

The developing of a vision for the future will help towards a circular business as well. This vision works for as well as companies as governments. It might even help to realize that the circular economy is a necessary way to meet the goals (External appendix, respondent B).

Another point about circular businesses is about start-ups. Respondent 1 (External appendix) said that it is easier for start-ups to set up circularity. *"Because they can start it without an old history, so they can do whatever they want to do."*

Some respondents agreed with help of professionals. *"You are sure that you are doing the right things, because research of universities is developing faster than the economy. When you want to be market leader, you also need to know the optimal techniques and stuffs."* (External appendix, respondent 2).

Perseverance is an essential part of changing towards a circular business. Perseverance is needed for every change in business strategies. This change is also called a challenge by respondents 3 and 5 (External appendix).

Respondent 4 thinks that the economy should change in a way that people borrow stuff instead of selling: *"we must create an economy wherein you borrow stuff. So I do not make electronical installations, but I give people light. I do not sell heating installations, no I deliver heat. (...) Yes, delivering of services. And that is the right path we need to take. And it goes that direction already."* (External appendix).

#### 4.4. EDUCATION

Education is one pillar of the Triple Helix cooperation. All respondents do believe education is a source which could be used during the transition. The question: could education help towards a circular economy is answered by most respondents with: *"Absolutely, people are most creative between the age of 16 and 22"* (External appendix, respondent 1). In the Netherlands, different levels of education exist. Many respondents do think all levels are important during the transition. As well as Vocational training, Universities of Applied Sciences, and Research Universities. Also, some respondents do think it is a task for Cleantech Regio to connect education to companies (External appendix, respondent 3). Respondent C (External appendix) do not see chances in connecting the lower education to companies.

How education could help in transition is filled in as well by many respondents. These ideas are shown below:

- Students could do research to sustainable building materials (External appendix, respondent 2).
- Cooperation with Cleantech Regio to test and develop materials or processes (External appendix, respondent 5).

- Cooperation with Cleantech Regio to start a knowledge centre. This knowledge must be shared and available for companies (External appendix, respondent 1).
- Research to new, sustainable business models. *"Besides that, Amsterdam University of Applied Sciences does research to these projects and how they could be implemented in the surroundings of Amsterdam."* (External appendix, respondent A).
- Kind of studies must be based on the market. *"Now, vocational education is often set up to bring profit to the school (to attract students). The economy is decisive for the kind of study, instead of the market. So schools just found a study like: 'well, this sounds nice for the market and we can make some money on it' and then they developed that study. With results that companies do not want those graduates."* (External appendix, respondent 4).
- Offering more subjects about circularity. It might be possible to offer some guest lectures. Since teachers are not familiar with the topic, hiring guest speakers might be a solution. The students like it, because it is variegated (External appendix, respondent 5).
- Offering real case projects about circularity. *"Cooperate with education is the best thing to do. (...) In that way, we found the best solution to make the building sustainable. Super awesome. Young people learned so much and older people learned to not think in barriers but in solutions."* (External appendix, respondent 4).
- Awareness. *"Students need to be more aware of circularity. They are future customers."* (External appendix, respondent 2).

#### 4.5. TASKS FOR CLEANTECH REGIO

Many ideas for Cleantech Regio came out of the interviews. The concerned topics are shown below.

##### PUSHING

Respondents said that Pusher could be an efficient role for Cleantech Regio. It will keep on the acceleration. *"Not just a meeting once a year but calling once a month. (...) Even though they really want it, their focus is soon back to running the standard businesses."* (External appendix, respondent B).

One respondent does not agree with this pushing. This respondent is of a similar organisation: *"We actually only work with companies who show us perseverance."* (External appendix, respondent C).

##### FAMILIARITY OF CLEANTECH REGIO

Many respondents said that Cleantech Regio should be a well-known organization in the region. Right now, the citizens do not know Cleantech Regio. *"What notes a company or society of their actions? That is the question over and over. And the society, do they know that we are a Cleantech region? The communication, how do you let them note it?"* (External appendix, respondent 4).

##### KOPLOPERPROJECT (FORERUNNER PROJECT)

The Koploperproject (English: Forerunner project) came out the literature as a well working project. Some of the respondents called this project by their own and sometimes the researcher asked to their opinion. Many respondents do like the project. *"We organized it as well. A small baker and a huge transport company were sitting next to each other to share data. I thought it would never work out, but afterwards they were very enthusiastic about it!"* (External appendix, respondent D). One respondent even came up with the idea to cooperate with education, during this Koploperproject. It could spare some time (External appendix, respondent 3). It is important to keep in touch with the forerunners, otherwise you will lose them (External appendix, respondent D).

## FINANCIAL SOLUTIONS

Cleantech Regio could provide information about financing. This knowledge could also be shared during events. More information about those events is mentioned in heading of Events with Workshops. Cleantech Regio could also brainstorm together with stakeholders for having funds, instead of funding by itself (External appendix, respondent C).

## CONVINCING

In opinion of some respondents, convincing is the key to start the transition. As well as the entire society (External appendix, respondent 1) as companies need to be convinced.

## FOCUSSING ON SOCIETY (INSTEAD OF 1 COMPANY)

This task is different for many respondents. Some do think focussing on society will work, others do think focussing on 1 business will work. Arguments: *"We note it is better to not focus only at one, individual company but focus at the cooperation between companies. You can start thinking of one company and how they can become circular, but you will think only of products they produce, the supply, where they make it, how could it become sustainable/ circular. But you will end up in the LED-light-discussion and change minimal changes which might have an impact. We do note it is not like that, but a social and organizational issue."* (External appendix, respondent B). Another respondent said: *"The companies want to be stimulated and taken into the entire region. They do not want to be alone. That result came out one of our Koploperprojects (English: Forerunner projects). They felt like a lonely pioneer. Now they got more support and they think that is important."* (External appendix, respondent D).

## FOCUSSING ON 1 COMPANY (INSTEAD OF WHOLE SOCIETY)

Some respondents do think focussing at 1 company might have more results. When focussing at one company, it will become clear who can make changes in running the business. Zooming out however, will end up in less results. Zooming in will be more effective (External appendix, respondent B).

## SHARING SUCCESSFUL STORIES

To convince people and make them aware, it might help to share successful stories (External appendix, respondent 5, C, and D). Also, one respondent thinks that sharing the non-successful stories might be good as well. It is good to get familiar with the weaknesses (External appendix, respondent 5).

## AWARENESS WITHIN SME ORGANIZATIONS

Another respondent thinks awareness within the SME organizations might help. The SME associations can help creating this awareness in their network (External appendix, respondent 2).

## PROJECTS

Cleantech could participate in projects. When starting projects, it is an advantage to have a connection between education and government. This role could be fulfilled by Cleantech Regio (External appendix, respondent B, 1, and C). Similar organizations work like this: *"A member has a problem, comes to us with some wishes. And we will look for starting up a project. Three different activities can apply: Matchmaking, Business case Development and Project Support."* (External appendix, respondent C).

## REGIONAL WASTE COLLECTION

To support the circularity of materials, waste could be region collected. One respondent came up with this idea: *“Actually you should ask Cleantech Regio: how would you organize that all installers will collect their central heating boiler at the same place?”* (External appendix, respondent 4). The same respondent had additions to his idea: *“Well, it is a nice project to think about the waste streams and how these streams could be regional used, in an efficient way? Because many waste is still going to the waste dump even though it could be recycled.”* (External appendix, respondent 4).

## SUPPORT OF PILOT PROJECTS

Some similar organizations are supporting pilot projects. Some projects just start with an idea and need to be supported, otherwise they get lost (External appendix, respondent A). *“And then we develop a pilot project. The pilot project is subsequently transferred.”* (External appendix, respondent C).

## CLEANTECH PLATFORM

Many respondents do desire a platform for Cleantech related topics. *“Easy knowledge available at a platform. I realise, this knowledge is coming from us. This knowledge must be shared so people could use it.”* (External appendix, respondent 1). The availability in this case is very important. Because many circular knowledges are still locked for the world. One respondent said that he had to pay for information about sustainable materials. And this information might be owned by the company who sells the material. So it is even not objective. Cleantech Regio must share the information, objectively (External appendix, respondent 2).

One respondent told about a project which worked very well. This project is replicated in other regions. In his opinion, Cleantech Regio could have shared this project. Cleantech Regio could use a platform for it (External appendix, respondent 3). Another respondent thinks that the network could improve in that way: *“they have much knowledge due to their huge network, but this network is not shared or focussed on results.”* (External appendix, respondent 4).

A respondent from a similar organization works with the aim to create an innovation platform, where governments, private organizations and knowledge institutes cooperate (External appendix, respondent A). Respondent D called this platform *“handy”* (External appendix).

Sharing knowledge could accelerate, in opinion of respondent 1: *“Yes, for that reason databases need to be found and structures need to be created. The knowledge should be collected and it happens due to some companies but it needs to accelerate.”* (External appendix).

## EVENTS WITH WORKSHOPS

Many respondents do agree that events with information about the circular economy are uninteresting. They do know it is necessary to be circular, so they desire workshops during these network-events: *“Meetings about circular economy and that kind of stuff: I am already familiar with that.”* (External appendix, respondent 2). A respondent came up this idea: *“Branch organizations do organize nice stuff, they do offer workshops about trading and that kind of stuff.”* (External appendix, respondent 3). Some respondents are interested in events about funding of circular projects, circular purchase, and chances of circularity.

One respondent would even like to invite people to their company, to show and teach how they run their circular business: *“With different companies, different industries together. (...) A forest ranger with a civil technician, you will get nice outcomes because everybody has ideas.”* (External appendix, respondent 5).

## CLEANTECH MUST PROVIDE DEMAND FOR CIRCULAR PRODUCTS/ SERVICES

One of the biggest barriers for circular products and services is the unsecure demand. In that case, Cleantech Regio must try to break through this linear economy and make it circular. Awareness is a very important part (External appendix, respondent 2). One respondent describes the barrier well: *"It might be so that you have a good idea, and this year it does not work well. But within 3 years it is a great success. It is hard to estimate either the market is ready for your ideas or not."* (External appendix, respondent 4).

Another respondent came up with some solutions: *"I cannot estimate well either they have influence or not, but they should have an influence at the demand side. There must be a higher demand on circular products. Maybe it is possible to higher this by governmental orders. But also by companies."* (External appendix, respondent 2).

## ROLES

Some roles which have been called by respondents are:

- Inspirer (External appendix, respondent D)
- Coordinator (External appendix, respondent 3)
- Knowledge creator (External appendix, respondent 1)
- Connector (next section)
- Pusher/ Driver (External appendix, respondent B)

## 4.6. CONNECTING AND COOPERATION

Many respondents gave information about the best way to build a cooperation and connect different parties. This section gives the overview.

### CONNECTING IS EFFICIENT

Almost all respondents agree that 'connector' is an important role for Cleantech Regio. *"Let parties find each other."* (External appendix, respondent 1). This respondent explained the procedure he used: *"I am a kind of broker, connector. 'There is a problem, how can we transfer it into a chance? And which parties do I need?' And then I invite those, draw the problem and find a solution together."* (External appendix, respondent B).

### SESSIONS FOR COOPERATION

The respondents who are working at similar organizations do organize sessions with companies, to connect different parties. If a party has an idea or problem, those similar organizations discuss it. They organize a session and invite different problem solvers. For example, with SME's or start-ups. *"And normally, these sessions have an outcome. Then we do support the outcoming project."* (External appendix, respondent C). These sessions mainly speed up finding solutions for urban challenges (External appendix, respondent A).

### COOPERATION

Cooperation can exist of different parties and different methods. The ideas of respondents are shown below.

- With industrial estate: Some respondents do work together with the companies based at the industrial estate. It might solve problems easily and nearby. (External appendix, respondent B).
- With different industries (External appendix, respondent B).
- With similar industries. Due to cooperate with competitors, companies could learn of each other. Knowledge and expertise can be shared (External appendix, respondent 1 and 3).
- With companies who have a similar policy: *"the biggest key to success is having a common target."* (External appendix, respondent 1).



- Opinion of director in cooperation: many respondents do think the director is a decisive part of having a successful cooperation. The director needs to have the same vision and ideas. It works faster than cooperate with employees of a company (External appendix, respondent 2 and D).
- Some companies develop a product with other companies, as result of cooperation. One respondent does it (External appendix, respondent 5).
- Start limit your scope: *"It is actually important to limit your scope. (...) Do not involve too many entrepreneurs in once. Just begin with some and try to be successful with them. And when it starts to be successful, the others will involve soon. If you with a big scope, you will end up in a large discussion without any conversational structures. So, choose 1 and just do it!"* (External appendix, respondent 4).

#### BARRIERS OF COOPERATION

Barriers for cooperation are also given by respondents. For example, this respondent: *"an installer who is working for 10% of his time with me and for 90% with a traditional building company. For that person, it is hard to think in a different way. So that is a problem. But I hope it will improve by cooperation."* (External appendix, respondent 2).

It also happens that all cooperate companies do not have enough knowledge to solve the project (External appendix, respondent 4).

#### 4.7. ORGANIZATION & TRIPLE HELIX

Some answers belong to information about the organization Cleantech Regio and Triple Helix principles. The topics are shown below. Also, a section is formed with failure factors for Cleantech Regio.

##### CLEANTECH REGIO WITH VISION

One respondent thinks Cleantech Regio must create a team with vision: *"I told a civil servant: 'I really hope you will finally compose a team, made of 1 or 2 aldermen, 4 to 5 civil servants who dare to think future-orientated, without any obstacles. Maybe together with entrepreneurs to create a vision like we did for 2022. Just make it Apeldoorn 2022. With a vision for sustainability, circular community. Because that is the thing we want! And when you set up goals, you will make an operative plan, without obstacles: just do it. Together with education, social entrepreneurs, regular entrepreneurs, and citizens."* (External appendix, respondent 3). The same respondent added: *"you can also make Stedendriehoek 2022. But one disadvantage you will face is (...) that it will take too long before you reach something since everybody needs to feedback the situation. So, it is faster to start with just one municipality."*

##### CLEAR OVERVIEW OF TOPICS

This respondent works at a similar organization, which operates in four main topics: *"water, energy efficiency, urban labs and bio-based/ circular."* (External appendix, respondent C).

##### INVOLVE CITIZENS

Multiple respondents do think citizens must be involved as well. Most of them also think that the citizens are not familiar with Cleantech Regio's activities. (External appendix, respondent 3). One respondent uses a media platform, to make citizens able to online post something about circularity and discuss about the topic of smart city (External appendix, respondent A).

## KEEP KNOWLEDGE TO WHO IT BELONGS TO

In opinion to one respondent, it is important to keep the knowledge to the person it belongs to. This person also agreed it as very efficient: *"It seems very efficient to me because specific knowledge takes time and effort. You can find the knowledge of some specialists."* (External appendix, respondent 5).

## TRIPLE HELIX

The respondents also came with many ideas about the improvisation of Triple Helix principles. Involving citizens, as mentioned before is one of those ideas. To involve education, labs for students could be an idea: *"we also have a department with product development, where student teams are doing that. I like it, because combinations of studies and levels of education can involve. Also, start-ups can involve. (...) Cleantech Regio could play a role in these labs as well."* (External appendix, respondent 1).

Cleantech Regio also could also try to solve the governmental issues of companies. For example: *"When a civil servant does something wrong about circular economy, he does not lose his job."* (External appendix, respondent 2).

Another respondent thinks that adding health care institutes to the Triple Helix might also be effective.

A close cooperation with the department of innovation of each municipality will also help accelerate the transition (External appendix, respondent A).

## ASSOCIATION

All respondents who work at similar organizations as Cleantech Regio do agree being an (cooperative) association is very effective. The 3 pillars of Triple Helix are members of the associations. All of them do pay a contribution for this membership and this contribution is going to as well as full-time equivalents for employees of the association, as projects and events: *"Actually, it is a requirement for member to play an active role in our association. They must do projects, like offering the project or cooperate in projects. (...) In that way, we note companies are inspired to do something."* (External appendix, respondent B).

*"A membership of this association is, of course, already an incentive to involve the clean technology and transition."* (External appendix, respondent C).

These associations consist of different memberships. Starters and SME pay less contribution than the bigger corporates. Also, the educational and governmental institutes do pay for a membership.

After the Forerunner project (Koploperproject) of Ooststellingwerf, the entrepreneurs wanted to stay connected. For that reason, they founded a foundation: Foundation Sustainable Ooststellingwerf. The entrepreneurs, education and government are cooperating: *"They think like: 'we need to keep it together, we found our own foundation and will work together to make a sustainable Ooststellingwerf. And it works. I think it is a good method.'" (External appendix, respondent D).*

## NETWORK INCLUDED INVESTORS

Investors should also be connected in the Cleantech Regio network. In opinion of one respondent, investors are needed to invest in projects. They can fund projects (External appendix, respondent C).

## FAILURE FACTORS

Some failure factors are asked as well. The respondents gave many answers. These are shown below.

- Not using the available network by connecting different parties (External appendix, respondent C).



- Trying to be too multidisciplinary. The bigger the project, the harder it is (External appendix, respondent 3, B, and D).
- Only waiting for ideas of someone else. *"We have a network, they ask us for help. We cannot start something by ourselves."* (External appendix, respondent C).
- Being too much into government is also a failure in some respondents' eyes (External appendix, respondent 3 and 1).
- It is hard to not talk too much, but this is a big failure (External appendix, respondent D).
- Not familiar enough. Citizens do not know Cleantech Regio. As well as many civil servants (External appendix, respondent 4).
- When Cleantech Regio wants to be part of commercial business. The consultants get paid by giving advice, this is not a role for Cleantech Regio (External appendix, respondent 5).
- When plans are not clear enough. Companies want clear results/ plans (External appendix, respondent D).

## 5. DATA ANALYSIS

After collection and procession of all results, the literature and interview results are compared with each other. This is called the analysis (Baarda & Bakker, 2013). Obviously, some topics for literature and interviews are both the same. These points are shown in section 'Similar outcomes'. After that, the model of Unilever is applied to all results. This is described in section 'Unilever model'.

### 5.1. SIMILAR OUTCOMES

The outcomes of literature which are mentioned in Chapter 3.2. Literature Overview are compared with the results of interviews. The similar outcomes which came out of this comparison are shown in this section. The table which was given in Chapter 2 Research Design is used to illustrate the comparison.

The topics are divided over Section Government, Legislation, Circular business, Education, Tasks for Cleantech Regio, and Connection & Cooperation and Organization & Triple Helix.

#### 5.1.1. GOVERNMENT

The similar governmental outcomes are shown in Table 2, including the source it comes from and the respondent who mentioned this outcome.

Table 2- Comparing governmental results with literature and respondents

<b>Outcome</b>	<b>Source</b>	<b>Respondent</b>
<i>Long-term vision as government</i>	Book Ritter & Bet (De Ritter & Bet, 2016)	C
<i>Exemplary role as government</i>	Book Anne-Marie Rakhorst (Rakhorst, 2012)	
<i>Facilitating role</i>	Website with interview Jan Jonker (Kraay, 2017)	1

It is similar for both that the government must have a long-termed vision in maintain their policy and doing their investments. This also leads to the exemplary role they could have, in being leader of circular development.

#### 5.1.2. LEGISLATION

Table 3 shows the similar outcomes related to legislation.

Table 3- Comparing legislation results with literature and respondents

<b>Outcome</b>	<b>Source</b>	<b>Respondent</b>
<i>Invitations to tender sustainable based</i>	Book Anne-Marie Rakhorst (Rakhorst, 2012)	2,5
<i>Enforcing law</i>	Book Ritter & Bet (De Ritter & Bet, 2016)	D,1
<i>Carbon- taxes</i>	Book Anne-Marie Rakhorst (Rakhorst, 2012)	Website with interview Jan Jonker (Kraay, 2017) D,1

As mentioned in previous section, the government must do their invitations to tender sustainable based. The Procurement Law could be changed to maintain this point. The legislation which is about sustainability must improve by maintenance, it could be done by fines. Also, change of laws is possible to accelerate the transition. An example of this, is the Carbon-taxes. As well as the literature and some respondents called this as a well-working instrument.

### 5.1.3. CIRCULAR BUSINESS

The similar outcomes of topic circular business are shown in Table 4.

Table 4- Comparing circular business results with literature and respondents

Outcome	Source	Respondent
Supply and demand of circular products	Book Ritter & Bet (De Ritter & Bet, 2016)	4
Awareness of employees	Book Ritter & Bet (De Ritter & Bet, 2016)	2
Subsidy of government	Book Ritter & Bet (De Ritter & Bet, 2016)	C, D
Involve employees	Book Ritter & Bet (De Ritter & Bet, 2016)	3,5
Borrow economy	Report OPAi & MVO Nederland (Schoolderman, et al., 2014)	Movie of Ellen MacArthur Foundation (Foundation E. M., 2012)

Some barriers for companies which have been given by respondents, are similar for the literature. One of this is the supply and demand for circular products. The suppliers do not feel responsible for the products they produce. The demand of circular produced products is not high enough. Another barrier which has been given by respondents and literature is awareness of employees. The employees within the companies are not aware enough of the circular business. A solution is given as well: involve employees as much as possible by, for example, brainstorm sessions.

A financial solution which has been given in the literature and interviews is to able subsidies from the government.

Borrowing stuff instead of selling is also an essential of the circular economy. One respondent came with this. Maybe Cleantech Regio should let companies start thinking in the service they could sell or deliver.

### 5.1.4. EDUCATION

The Table 5 below shows the similar outcomes of the topic education.

Table 5- Comparing educational results with literature and respondents

Outcome	Source	Respondent
Education is important	Report of SER (Development, 2016)	
Themes of study links to market	Report of SER (Development, 2016)	4
Real case projects with students	Book Ritter & Bet (De Ritter & Bet, 2016)	4
Awareness	Book Ritter & Bet (De Ritter & Bet, 2016)	2

When comparing the educational results of interviews to the results found in literature, the following parts are obvious: education is important, the study themes should fit with the economy and demand, students can be involved to real projects, and awareness starts at the education.

### 5.1.5. TASKS FOR CLEANTECH REGIO

The similar outcomes according to the tasks for Cleantech Regio are shown in Table 6.

Table 6- Comparing Tasks for Cleantech Regio results with literature and respondents

Outcome	Source	Respondent
<i>Pusher and driver as role</i>	Research Janneke Wolkorte (Wolkorte, 2012)	B
<i>Koploperproject</i> (English: <i>Forerunner project</i> )	Research Joost Smits & Bauke Visser (Visser & Smits, 2016)	D, 3
<i>Convincing, inspirer of society</i>	Research Janneke Wolkorte (Wolkorte, 2012)	1
<i>Convincing within companies</i>	Book Ritter & Bet (De Ritter & Bet, 2016)	
<i>Connector, Bridge builder</i>	Research Janneke Wolkorte (Wolkorte, 2012)	C
<i>Sharing knowledge, platform</i>	Research Janneke Wolkorte (Wolkorte, 2012)	1, 2
<i>Creation of demand</i>	Book Ritter & Bet (De Ritter & Bet, 2016)	
<i>Inspirer</i>	Research Janneke Wolkorte (Wolkorte, 2012)	Report of SER (Development, 2016) D

The role of Pusher, Inspirer/ Convincer, Connector/ Bridge builder, and Inspirer are similar for literature and interviews. The idea of a 'Koploperproject' (English: Forerunner project) is also similar for both. Also, the platform is a great idea to share knowledge. In addition, Cleantech Regio must take care of the demand side.

### 5.1.6. CONNECTION & COOPERATION AND ORGANIZATION & TRIPLE HELIX

The outcomes of Connection & Cooperation and Organization & Triple Helix are combined and shown in Table 7.

Table 7- Comparing Connection & Cooperation + Organization & Triple Helix results with literature and respondents

Outcome	Source	Respondent
<i>Sessions for cooperation</i>	Research Janneke Wolkorte (Wolkorte, 2012)	C, A
<i>Cooperation is important</i>	Book Ritter & Bet + Book Anne-Marie Rakhorst (De Ritter & Bet, 2016) (Rakhorst, 2012)	Report of OPAi and MVO Nederland (Schoolderman, et al., 2014)
<i>Triple Helix principles</i>	Report of SER (Development, 2016)	
<i>Clear plans</i>	Website with interview Jan Jonker (Kraay, 2017)	D

Cooperation is important for both sources. To stimulate the cooperation, sessions could be organized. During these sessions, the three pillars of Triple Helix must be involved. And to work efficiently, clear plans must be created.

## 5.2. UNILEVER MODEL

The Unilever model is a model which could be used to analyse the data. The model describes the change of people's behaviour. The Unilever model helps interpreting the results of this research.

Some questions of the model can be answered. As mentioned in chapter 3 Results Literature: *"Barriers – what are the things that stop people from adopting a new behaviour? Triggers – how could we get people to start a new behaviour? Motivators – what are the ways to help them stick with the new behaviour?"* (Unilever, 2011)

The model is interesting for Cleantech Regio since Cleantech Regio needs to stimulate and motivate companies first. In addition, these companies must stay connected and involved to the Cleantech Regio. As answer at the questions of the model, an overview of barriers, triggers, and motivators is shown below. After that, the 5 Levers for Change is filled in due to the 3 questions.

### BARRIERS

The barriers to change into circular business are found due to the interviews and the book of Monique de Ritter and Bram Bet (De Ritter & Bet, 2016). They are shortly listed together:

- Circular materials are created, but never tested. Developing circular materials is expensive and no demand creates a stop.
- Awareness, conviction. The utility is unknown.
- The suppliers do not produce circular products and do not feel responsible either.
- The conviction of circular must be sincere, not just because of marketing reasons.
- Circular products are too expensive.
- Consciousness of employees is absent.
- Carry through is hard for leaders, they do feel alone in the transition.
- The long-term-vision is absented by focussing at costs. It makes it hard to be leader in a linear economy since circularity is more expensive.
- Becoming circular as company is a big project which is not easy since the entire company must change.
- Saturation of residual streams is happening right now.

(Source: External appendix)

- Financial risks: the investment is high and it leads to a wait and see attitude.
- Lack of cooperation within and between organizations: some knowledge is lost in different departments. And organizations do not know if there is interest in parts of the production chain, this knowledge is, mostly, not shared.
- Less attention within the education: the topic circular economy is not educated enough; Universities of Applied Sciences are teaching it like a minor but not during the main part of studies.
- The role of the government and the regulation: not enough support by the government and awareness of the citizens
- Lack of decisiveness: companies know that time of discussing is done, it is time to operate but it is hard to agree with all the employees.

(Source: (De Ritter & Bet, 2016))

### TRIGGERS

The triggers are known as incentives, and some projects are also triggering in opinion of some respondents. The triggers are shown below:

- Family businesses have more awareness and are more triggered to start the transition
- Companies have an incentive in fact that they still do have a choice to change. In the future, they would not have a choice.

- Publicity of successful stories will attract more parties.
- The Koploperproject (English: Forerunner project) helps companies to feel less alone in transition.
- Cooperate with students works well, because they think more out-of-the-box.  
(Source: External appendix)
- The government must do their Invitations to tender in a sustainable way, so the government can serve as a good example (Rakhorst, 2012)
- Enforcing law, possibly add the Carbon-taxes.
- Being member of a circularity association is an incentive for people to involve the transition.  
(Source: External appendix)

## MOTIVATORS

The triggers help to start the new behaviour. The motivators help sticking on the new behaviour (Unilever, 2011). Being bonded to an association or Koploperproject (English: Forerunner project) might help sticking, as a respondent told. Due to this bonding, it is possible to keep people up-to-date about the progression in the circular field. Instruments to help people stick to the bonding are for example, sharing successful stories, organizing events, support of projects in cooperative way, and having a platform. In addition, the demand is very necessary for companies to keep on doing circular activities. The finance is still a hard part of changing into circular business. However, when having a right plan, and budget calculation, many possibilities appear. If not, a network with investors or subsidy might be a solution (External appendix).

## COMBINING LEVERS

The previously mentioned 3 pillars are combined in the 5 Levers for Change (Unilever, 2011). It is shown in Figure 4. The levers are filled in below.

*Understood (awareness + acceptance):* this part is the convincing part. People need to be convinced. That is possible by the Koploperproject (English: Forerunner project). During this project, a QuickScan of every company is taken. This scan shows the status of circularity in every company. By this, companies can note that the transition is relevant to them. Also, they can get some advice for getting circular with a clear plan. This plan shows clearly how much effort it takes to get circular. Some respondents agree that having a clear plan helps to get convinced, since changing into circular business is not as much as effort as expected (External appendix). As mentioned before, companies will stick to the network after participating the Koploperproject (English: Forerunner project).

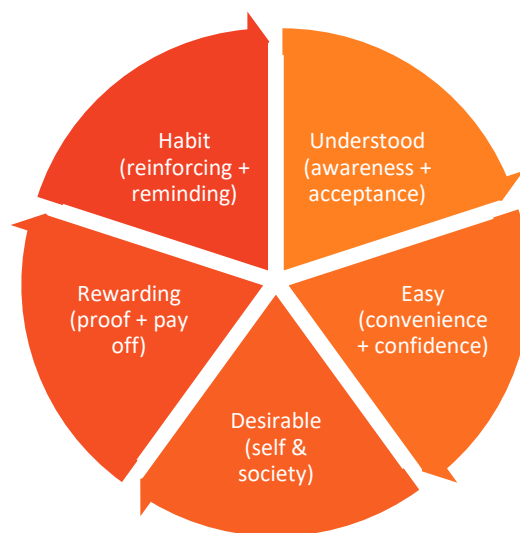


Figure 4- Unilever 5 Levers for change (Unilever, 2011), edited by Irene Robbereg

*Easy (convenience + confidence):* when organizing events, Cleantech Regio could get people more convenience and confidence in the circular world. It is important that the events are approachable, open, and for free (External appendix). Due to all examples and successful stories of other companies, people will get inspired.

*Desirable (self and society):* the new behaviour should fit to the business of companies. “We tend to emulate the lifestyles and habits of people we respect – like our parents or sometimes a celebrity – and follow norms in society.” (Unilever, 2011) The government should start with the exemplary role. It would not only have an inspirational function, but it would also create a demand for products/ services. In addition, inspiring speakers should give speeches, workshops, or sessions during the mentioned events (or during the Koploperproject).

*Rewarding (proof + pay off):* the rewarding of companies who did participate the Koploperprojects (English: Forerunner project) will be in the end of the project. After every Koploperproject, a symposium will be organized and all participants will get a reward. Companies who did not participate the Koploperproject, will receive a reward when it yields money. Also, a respondent mentioned (External appendix) that handing very simple certificates to companies is very appreciated.

*Habit (reinforcing + reminding):* once people made the change into circular business, they need to stay connected. As mentioned by one respondent (External appendix), companies like to stay connected by a foundation or association to reach the common target. Even after participation in the Koploperproject companies must stay connected to confirm the cooperation. An association might be the solution. The tasks of this association are described in the section of Motivators.

## 6. CONCLUSION AND RECOMMENDATIONS

This chapter gives an answer to the research question. The research question was:

*What is the most efficient/ effective role or combination of roles for Cleantech Regio in supporting companies within the region of Stedendriehoek in transition towards a circular business?*

### 6.1. CONCLUSION

The research suggests that the answer to the research question is: Connector, Pusher, Inspirer, and Knowledge sharer/ creator. Cleantech Regio could have these four roles. Figure 5 shows the roles and recommendations, which are the actions Cleantech Regio can take to attain the circular economy. The actions are shown in the white boxes and are described in the next section.

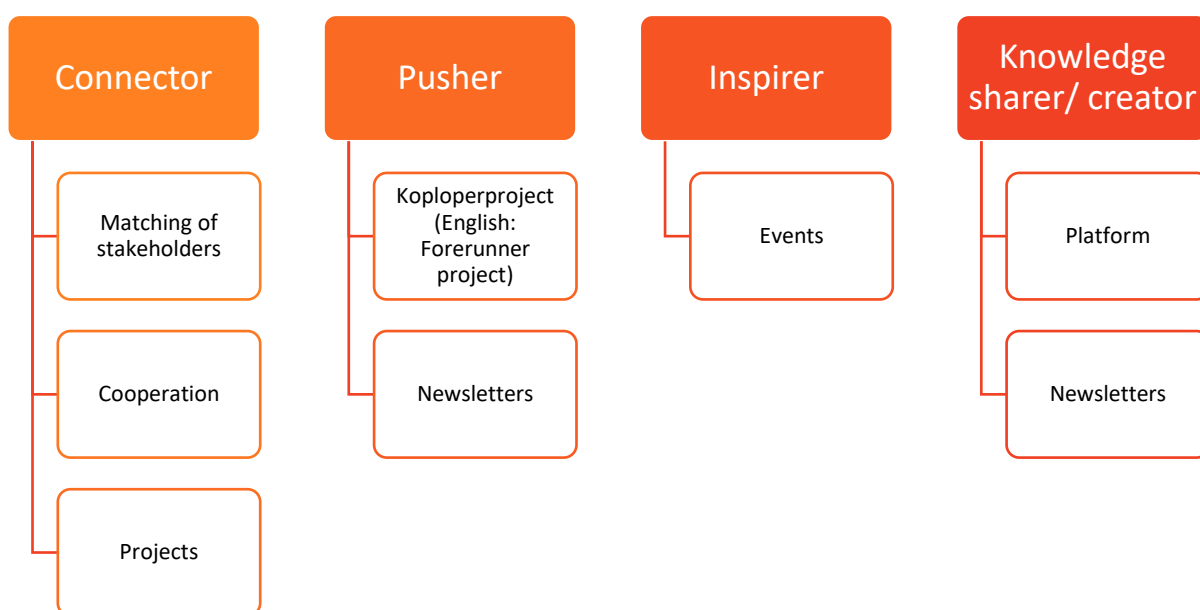


Figure 5- Roles for Cleantech Regio according the association of Cleantech Regio. The white boxes below show the recommendations: actions Cleantech Regio can take to maintain a circular economy.



## 6.2. RECOMMENDATIONS

A helpful tool is found in literature: The 5 Levers for Change (Unilever, 2011). This tool is analysed in chapter 5 Analysis of Results by all outcomes from interviews and literature. When combining 5 levers, a **main recommendation** can be drawn: founding an association.

One outcome of the model is the importance to bond people to Cleantech Regio. Founding an association in the Foundation of Cleantech Regio might be the solution. It agrees many points which have been given by respondents. Figure 5 of previous section gives an overview of all outcomes.

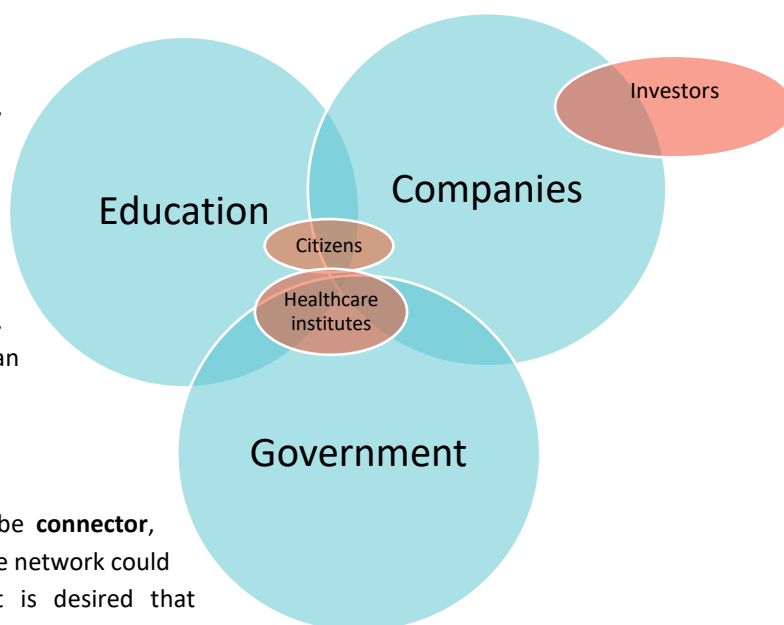
Below, all recommendations are listed below in an overview of instruments for Cleantech Regio. All instruments together belong to the main recommendation of an association. The instruments are:

- Network (which parties belong to the association)
- Connection & Cooperation (Matching of stakeholders, Cooperation, Projects)
- Events
- Koploperproject (English: Forerunner project)
- Communication (Newsletters)
- Platform

### NETWORK

This study revealed that the network of this association could consist of all kinds of organizations. In addition, citizens could participate as well. An illustration of the network is shown as Figure 6. Companies would not only be represented by VNO-NCW like they are now, they can be member themselves. The communication level could raise and be more effective since it is more direct.

Figure 6- The Triple Helix network included investors, healthcare institutes, and citizens.



According to opinions of respondents, educational institutes must be connected to this network as well. Cooperation with students is possible and easier.

It is desirable to connect healthcare institutes and investors to the network. Because it is an open network, everybody can have a membership.

### CONNECTION AND COOPERATION

The main role of Cleantech Regio would be **connector**, according the outcomes of this research. The network could be used to connect different parties. It is desired that Cleantech Regio organizes cooperation sessions with related parties, perhaps with students or investors. Also, when legislation or governmental problems appear, or governmental support is desired, the government could be connected to the stakeholders as well. These cooperation sessions enable the possibility of pilot-projects and sustainable solutions. Start-up of new projects could be an initiative from the network or Cleantech Regio.

## EVENTS

Although connector is one possible role, Cleantech Regio could organize events to agree the desired role of an **inspirer** and connector. Some respondents do desire events with workshops. These workshops can include among others information about financing projects or circular supply. These events with educative workshops could maintain the circular knowledge of members and visitors. In addition, hiring a speaker **inspirer** and **convinces** people.

These events do also serve as network events. People can find each other and cooperation could get started.

## KOPILOPERPROJECT (FORERUNNER PROJECT)

The association is a network which operates for the entire society. When focussing at one specific company, it might help to organize Koploperprojects. As well as respondents as literature does agree, these projects are very inspiring and **driving** for starting the transition intern individual organizations. Cleantech Regio could facilitate these projects by hiring specialists.

## COMMUNICATION

Communication within the interviewed associations is often by weekly newsletters. These are sent weekly. The purpose of these letters is among others to share knowledge, keep members up-to-date, and reach parties directly. The letters have a **driving- Pusher role**. Because people are getting aware every week by the letters and get inspired by the successful stories contained in these letters.

## PLATFORM

Many respondents asked for a platform. The platform could be a website, which could be an open network for all members. It contains a database with all circular projects and services, like libraries have. The knowledge of educational institutes can also be shared in this database. Besides that, the newsletters can be shared in this platform as well as the successful stories. The role Cleantech Regio will have according to this platform is the **knowledge creator/ sharer**. This platform could achieve the acceleration of demand for circular products and services since they could be shared and published. Parties can find each other faster and in that way, demand for products or services is easier found.

## 7. DISCUSSION

This chapter consists the discussion of the entire research.

### 7.1. DISCUSSION OF RESEARCH DESIGN

First, the research design will be discussed. Some parts of the method have been changed during the research. These changes are discussed in this section.

#### COMPANY INTERVIEWS

The aim was to interview 8 companies with 3 persons each. This should have been reached by the 'snowball effect'. The reality is that only 5 companies are interviewed, 6 people in total. This is less than expected. Nevertheless, it was decided to continue the research since the researcher noted that all companies gave plenty (new) information. It was considered either there was a satisfaction of knowledge or not. The satisfaction was noted by an increasing amount of repeated answers of respondents. At this point, more knowledge could have been collected which results in less validity of this research.

#### SIMILAR ORGANIZATIONS INTERVIEWS

The aim of interviewing 5 similar organizations with 3 persons each, was also not achieved. Although this aim was almost reached, it might have been interesting to interview more than 4 organizations. The usage of 'snowball effect' was useful since some respondents came with an increasing number of similar organizations. Again, it was considered either there was a satisfaction of knowledge or not. In this case, it was considered as enough knowledge since respondents came with plenty and repeated information. But it could have led to less validity.

One of the respondents did not have time to participate an interview, so this respondent sent a Frequently Asked Questions document. This document was assumed as interview since questions and answers are given in that kind of documents. Not all related interview questions were considered in the document, so it might result in less validity of this research.

Because not too many organizations were found, one municipality was considered as organization to interview for this research. This municipality did a lot in sustain the region, and did met the research conditions. This respondent was also participating in a similar organization which was a foundation. The researcher was not familiar with this foundation. The respondent came with many information about the foundation so it was considered unnecessary to plan a separated interview with the foundation. Since the respondent was from a municipality instead of organization, it might have influenced the outcomes.

#### FAMILIARITY CLEANTECH REGIO

Some respondents were not familiar with Cleantech Regio. Some questions, related to the desires might have been influenced. The researcher explained the aim of Cleantech Regio and Triple Helix principles, until the respondent became more familiar. Almost all respondents who did not know Cleantech Regio, were familiar with the Triple Helix principles or similar organizations so it was easy to explain them how Cleantech Regio operates. Although these respondents became familiar, it might have influenced outcomes.

## 7.2. DISCUSSION OF RESULTS

In this section, some remarkable results are discussed. Also, further research is discussed.

### DIFFERENT OPINIONS OF RESPONDENTS

Remarkable is that some respondents do assent and some respondents do not assent about the same point. Perhaps these respondents did not talk about the same. For example, the question: what is efficient when it comes to support of companies? Some respondents did assent that supporting one individual organization is more efficient than the entire region. Other respondents did assent that focussing at the entire region is more efficient than just one individual organization. The researcher included both findings in results. During analysis, the solution is found to add the Koploperproject (English: Forerunner project), so both are possible.

### FINANCE

Finance is always a hard part and the different opinions did not make it easy to find solutions and/ or findings. Some respondents think that finance is not a problem when there is enough willingness to change. Some others think that Cleantech Regio must fund some projects. Others think that investors must do these investments. In contrast, when the business model is right, funding is not always needed. And not all similar organizations do invest in their members. In their opinion, companies must find the solution for finance. To contrast, they would be grateful to invest if they have enough money. Because all findings were so different, it was too hard to draw a conclusion. In this way, some further research might be necessary.

The transition must be profitable, and many researches have shown that a circular economy is profitable but these facts are not enough to convince companies. This part might work when successful stories and knowledge is shared. This research highlights that many financial problems can be solved by convincing people first.

Awareness and convincing is very important. When people are convinced, like the interviewed companies are, the willingness to change overrules the obstacles and serves the perseverance.

### COVERING ALL OBSTACLES

As mentioned in the research aim, the best role might be reached when the obstacles are considered. Although these obstacles are interwoven in interview questions, the obstacles are a bit rejected due to the code three which is used in the programme Kwalitan. This have led to different topics in showing the results.

Finance is, as mentioned before, rejected since it has a relation to awareness and convincing. The education and government are, as part of the network, still involved in the recommendations. Although the desires to education and government are as much as possible mentioned in the recommendations, not all points could be included.

The main recommendation which is given concerning education is the involvement of students. It covers awareness and by involving students in projects, cooperation can start, which indirectly results in more attention for circularity in education.

The main recommendation for government was harder to explain. Like finance, the opinions of what government should do are very different. The cooperation with government is very long-winded in opinion of many respondents. It delays many circular initiatives. When government is incorporated in the network, the cooperation might improve by Cleantech Regio. During the sessions which are recommended to organize for cooperation, Cleantech Regio can involve government. In this way, it might increase the efficiency since the cooperation is only started when necessary. It might be even better when cooperation with government is rejected as much as possible, and government can have a main facilitating role. Cleantech Regio decides either the government must be involved, or not.

Other obstacles were the lack of cooperation within and between organizations and the perseverance in companies. These two are mainly considered in this research. The outcomes do totally link with these obstacles.

### CIRCULAR BUSINESS

Although not expected, this research gives much information about circular business. Since the research question of this study is not related to this information, this information is not mentioned in the conclusion. These essentials are included in Chapter 5.1 Data analysis: Similar outcomes of Circular business. However, not all essentials are included in the conclusion nor recommendations. When applying the recommendations, or when the reader is interested in these essentials, it is recommended to read this chapter.

### FURTHER RESEARCH

As mentioned before, it might be good when business models are developed. These kinds of models must be tested in a reliable surrounding. It might be good when some places in The Netherlands can serve as pilot for the circular economy. These places should have everything but linear principles, to agree with the circularity. The chain of waste must be closed, when willing to change the entire society. The test locations enable the sharing of reliable knowledge and successful stories. These sharing of successful stories improve the outcomes of this research.

Since some respondents prefer the Carbon-taxes, it might be good to do some research to the implementation of this law.

Different respondents desire more research to circular materials which can apply in the construction field. When these materials become more common, construction companies can apply those materials more often. The demand for these products will also results in a better price. It will improve the outcomes of this research.

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## APPENDIX I - INFORMATION OF COMPLETION 'THE NETHERLANDS CIRCULAR IN 2050'

It is proven that our earth's climate is changing. Not only by natural effect, but also by human activities. These human activities produce greenhouse gases. The IPCC investigates the effects of these greenhouse gases. The IPCC is the Intergovernmental Panel on Climate Change. The changing climate has many problems, the main problem is the temperature that will increase:

*"Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks."* (Change I. P., Headline statements from the Summary for Policymakers, 2014)

The IPCC is assessing the climate change and provide this information as a scientific basis for governments and their environmental policies. These assessments serve also as basis for the negotiations of the UN Climate Conference – the United Nations Framework Convention on Climate Change (UNFCCC) (Change I. P., IPCC factsheet: What is the IPCC?, 2014).

The United Nations Framework Convention on Climate Change (UNFCCC) is founded in 1994. Nowadays, 197 countries have signed the convention of Paris and are called parties of the convention. The aim of the UNFCCC is to prevent *"dangerous" human interference with the climate system*" (Change U. N., 2014) .

These kind of agreements, force the Dutch government to change their environmental policy. As a result, the Dutch government agreed with the last version of the UNFCCC convention of Paris. The aim of this convention is to limit the global warming and well below the 2 Celsius degrees with a clear view on the 1,5 Celsius degrees (Netherlands, Klimaatbeleid, sd).



## APPENDIX II – ORGANIGRAM OF CLEANTECH REGIO

This organigram shows the organization structure of Cleantech Regio. The 'Strategische Board Stedendriehoek' on top, which is represented by the Triple Helix principle (entrepreneurs, education, and government), and represented by the municipalities. Together, they work towards a 'cleantech' region by all kind of projects. The tables are tables for discussion about each own topic and the CTRD (Cleantech Regio Development) is the executive part of Cleantech Regio who implement the ideas of the tables. Next to that, 3 flywheel projects 'Cities and villages', 'Mobility', and 'Icon A1' are developed (Regio, Omgevingsagenda 2.0).

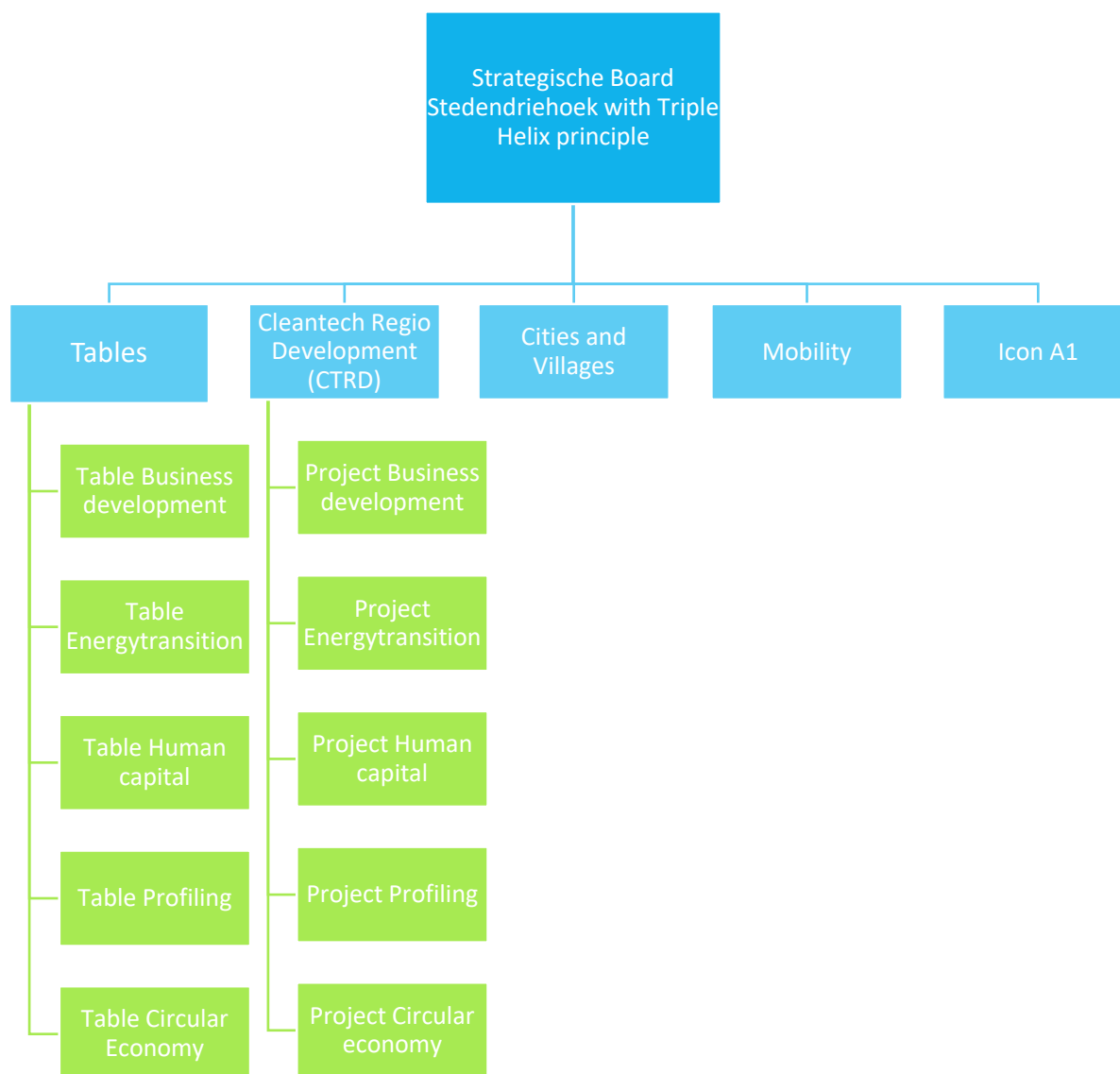


Figure 7- Organigram of Cleantech Regio

Source: (Regio, Omgevingsagenda 2.0) and drawn by Irene Robberegt

## APPENDIX III – INTERVIEW QUESTIONS COMPANIES (DUTCH)

Dit interview zal gaan over de circulaire bedrijfsvoering: wat heeft u hier tot nu toe mee gedaan?

Wat zijn de resultaten tot nu toe?

Wat ging er goed?

Bent u ook al tegen knelpunten aangelopen hierbij? Welke?

Wat is het belangrijkste probleem waar u tegenaan loopt?

### **1. Samenwerking:**

Werkt u samen met andere bedrijven? Zo ja: op wat voor manier?

Wat zijn uw ervaringen hiermee?

Zou deze samenwerking ook verbeterd kunnen worden? Hoe?

Hoe ziet u de meest efficiënte samenwerking voor zich?

Hoe verloopt de samenwerking binnen uw bedrijf (intern), om een circulaire bedrijfsvoering te realiseren? Zou dit op een manier efficiënter kunnen worden?

### **2. Overheid en wetgeving:**

Wat zijn uw ervaringen met overheid en wetgeving?

Werkt de wetgeving mee bij de overweging/ verandering naar circulaire bedrijfsvoering?

Werkt de wetgeving ook tegen bij de transitie? Om welke wetgeving gaat het dan?

Wat zijn uw wensen vanuit de overheid (gemeentes, provincies, rijk) om dit te verbeteren?

### **3. Onderwijs:**

Kan het onderwijs in uw ogen hulp bieden? Zo ja: op welk gebied?

Hoe zou de rol van het onderwijs dan ingevuld kunnen worden?

### **4. Financiën:**

Waren er financiële uitdagingen bij de overweging naar een circulaire bedrijfsvoering? Zo ja: welke? Zo nee: als een bedrijf dit wel zou ervaren, op welk gebied zou dit dan zijn?

Zijn hier ook oplossingen voor te bedenken? Zo ja: welke? Komen die vanuit het bedrijf of Cleantech Regio?

### **5. Doorzettingsvermogen:**

Is doorzettingsvermogen bij uw bedrijf een uitdaging, in de verandering naar circulaire bedrijfsvoering? Zo ja: op welk gebied?

Wat zou Cleantech Regio hierin kunnen doen?

**6. Algemeen:**

Heeft u algemene ideeën betreft de rol die een organisatie als Cleantech Regio in zou kunnen nemen?

Wat zou u zien als meest effectieve (succesfactoren)?

Wat zou een faalfactor zijn, als het komt tot support van bedrijven?

Heeft u verder nog toevoegingen of opmerkingen?

## APPENDIX III – INTERVIEW QUESTIONS COMPANIES (ENGLISH)

This interview will be about circular business management: what have you been doing concern this topic till now?

What are the results?

What did go well?

Did you meet barriers by doing this? Which?

What is the most important obstacle which you meet?

### **1. Cooperation:**

Do you cooperate with other companies? If so, in what way?

What are your experiences?

Could this cooperation be improved? How?

What would be the most efficient cooperation in your eyes?

How is the internal cooperation going to achieve a circular business? Could this be more efficient in a way?

### **2. Government and legislation**

What are your experiences with government and legislation?

Does the legislation contribute well to the consideration / change to circular business management?

Does the legislation counteract to the transition? Which?

What do you desire from the government (municipalities, provinces, empire) to improve their role?

### **3. Education**

Could education offer help? In what way?

How could the role of education be completed?

### **4. Finance**

Did you meet financial challenges by consideration towards a circular business? Which? If not, when a company does experience this, in what way would it be?

Are there solutions for these challenges? Which? Do they come up by the company or Cleantech Regio

### **5. Perseverance**

Is perseverance a challenge for your company? In what way?

What could Cleantech Regio do to cover this?

### **6. General**

Do you have general ideas about the role an organization like Cleantech Regio could have?

What do you take as most effective role (factor for success)?

What would be a failure factor, when supporting companies?

Do you have additions or comments?

## APPENDIX IV – INTERVIEW QUESTIONS SIMILAR ORGANIZATIONS (DUTCH)

Dit interview zal gaan over support van bedrijven, wanneer zij de transitie naar een circulaire bedrijfsvoering aan willen gaan. Wat is uw rol op dit moment t.o.v. de bedrijven?

Wat is de stand van zaken (resultaat)?

Wat zijn de ervaringen van de bedrijven, als reactie op uw rol?

Wat is uw belangrijkste instrument om een circulaire bedrijfsvoering te realiseren bij bedrijven?

### **1. Stimuleren van bedrijven**

Hoe stimuleert u bedrijven om mee te doen aan de transitie?

En hoe zorgt u ervoor dat deelnemende bedrijven gestimuleerd blijven?

Hoe gaat u te werk op gebied van samenwerking, binnen een bedrijf (intern)?

Wat zijn de ervaringen van de bedrijven?

### **2. Samenwerking:**

Doet u iets met samenwerking tussen de bedrijven?

Hoe gaat u te werk op gebied van samenwerking tussen de bedrijven?

Leidt dit instrument tot succes?

Wat zijn de ervaringen van de bedrijven?

### **3. Onderwijs:**

Werkt u ook samen met onderwijsinstellingen, om uw doelen te behalen?

Heeft u een instrument die ervoor zorgt dat het onderwijs ook een rol speelt in de ontwikkeling naar een circulaire economie en de bedrijfsvoering? Zo ja: welke?

Leidt dit instrument tot succes?

Wat zijn de ervaringen van de bedrijven?

### **4. Financiën:**

Wat zijn de ervaringen van de bedrijven wanneer het aankomt op financiële problemen tijdens de transitie?

Hoe zou u eventuele problemen oplossen?

Leidt dit instrument tot succes?

Wat zijn de ervaringen van bedrijven?

### **5. Overheid en wetgeving:**

Heeft u een instrument gevonden om de wetgeving geen openthoud te laten veroorzaken?

Wat doet u met de rol van de overheid?

Wat zijn uw ervaringen hiermee? En de ervaringen van de bedrijven?

#### **6. Doorzettingsvermogen:**

Wat is uw instrument als het aan komt op het doorzettingsvermogen van de bedrijven zelf?

Wat is uw ervaring hiermee? En de ervaringen van de bedrijven?

#### **7. Algemeen**

Wat is uw meest succesvolle instrument waardoor bedrijven meedoen aan de transitie naar een circulaire economie?

Heeft u verder nog ideeën hoe dit effectiever en efficiënter zou kunnen?

Wat is een faalfactor wanneer het aankomt op support van bedrijven?

## APPENDIX IV – INTERVIEW QUESTIONS SIMILAR ORGANIZATIONS (ENGLISH)

This interview is about support of companies, when they are making the transition towards a circular business.  
What is your role at the moment pertaining to companies?

What are the results till now?

What are the experiences of companies in relation to your role?

What is your most important instrument to achieve a circular business in companies?

### **1. Incentives of companies**

How do you stimulate the companies to participate the transition?

How do you take care all participating companies stay connected?

How do you organize a cooperation intern organization?

What are the experiences of companies?

### **2. Cooperation**

Do you cooperate between companies?

How do you operate in relation to cooperation between companies?

Does this instrument lead to success?

What are the experiences of companies?

### **3. Education**

Do you also cooperate with educational institutions to achieve your goals?

Do you have an instrument that plays a role in the development of a circular economy and business? If so, which one?

Does this instrument lead to success?

What are the experiences of companies?

### **4. Finance:**

What are the experiences of companies when it comes to financial problems during the transition?

How would you solve problems?

Does this instrument lead to success?

What are the experiences of companies?

### **5. Government and legislation:**

Have you found an instrument to prevent legislation problems?



What do you do with the role of government?

What are your experiences with this? And the experiences of the companies?

**6. Perseverance:**

What is your instrument when it comes to the perseverance of the companies themselves?

What is your experience with this? And the experiences of the companies?

**7. General**

What is your most successful instrument which helps companies participate in the transition towards a circular economy?

Do you have any ideas to how this might be more effective and efficient?

What is a failure factor when it comes to support of companies?

## APPENDIX V – BUTTERFLY DIAGRAM ELLEN MACARTHUR FOUNDATION

Figure 8 shows the butterfly diagram of the Ellen MacArthur Foundation. It includes the principles of a circular economy: maintain, reuse, remanufacture, and recycle products. It is not preferable to recover energy by incineration, or to landfill waste because these purposes are not circular.

**CIRCULAR ECONOMY - an industrial system that is restorative by design**

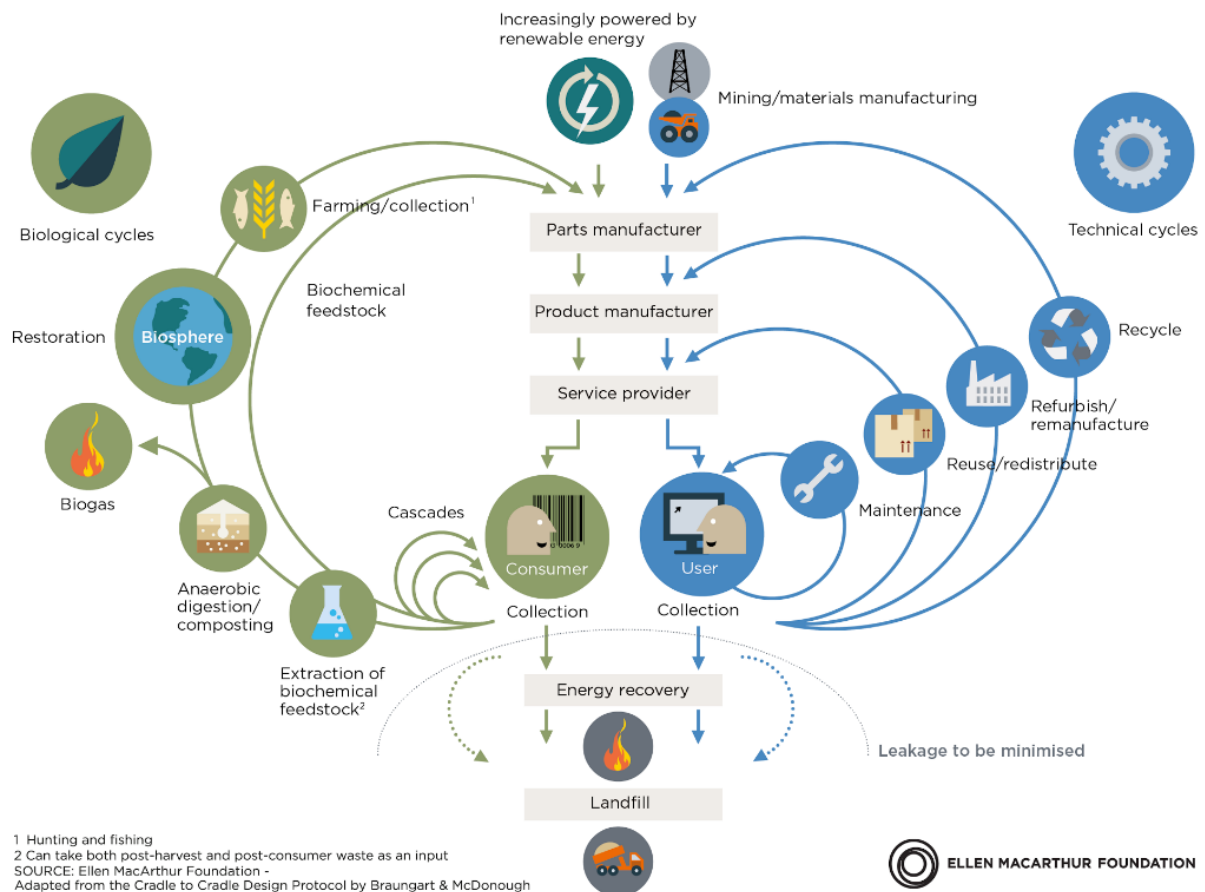


Figure 8- The Butterfly diagram of Ellen MacArthur Foundation (Foundation E. M.).