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Shared value creation through partnerships and social impact

A case study on incorporating social impact analysis for a groundbreaking waste to chemicals plant in Rotterdam, The Netherlands.

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Management summary

In this explorative case study, performed under assignment of AkzoNobel, the UN Sustainable Development Goals (SDG's) have been chosen to investigate the practical use for social impact measurement of a new innovative Waste to Chemicals (WTC) partnership in Rotterdam, The Netherlands. The new disruptive technology used by the WTC partnership changes the recycling and chemical industry by converting waste into valuable chemicals. For AkzoNobel, this thesis is part of a worldwide investigation on how to measure social impact.

This thesis, made for the major of strategic management, shows that the addition of value creation through social impact, the value proposition which is currently envisioned by the WTC partnership will be improved. Shared value will be created through partnerships and social impact measurement and will create a bold new societal business model where business and sustainability are entwined.

To derive to the conclusion of this thesis, experts within the area of social impact and partnerships have been interviewed as well as managers within the WTC partnership. Next to this, an extensive literature review has been done to generate an elaborate understanding in business management, sustainability, partnerships, strategic management and social impact.

For the WTC partnership, three areas of added social value are selected to create a competitive societal business model which enhances positive impact and reduces negative impact. The three areas are aligned to SDG's, the core business of the WTC partnership, the strategy of the individual partners and the local necessities of the community in Rotterdam. Various recommendations are made for each of the three areas: 1) Improving well-being of the community and employees; 2) Creating an innovative and knowledge driven organization; 3) Mitigation of negative aspects.

The SDG's have been chosen as goals and indicators within these areas because of their institutional nature. The Social Capital Protocol provided the valuation techniques to measure the chosen social impact. Monetization has been selected to make communication of the results possible towards a bigger public as this also has institutional value. Social impact tools and partnership management skills are needed to identify the goals and guide the partnership towards them without using too many resources. The partnership is a critical element in the creation of shared value. Without the alignment of the partnership and the specific resources available within the individual partners, the SDG's that are selected are too far from core business. To achieve this, the partnership should overcome identified barriers that have been divided into four main topics: interdependency, communication, the individual perspective and conflicting interests. Charles Darwin would probably have agreed as he stated:

'It is the long history of humankind (and animal kind, too) that those who learned to collaborate and improvise most effectively have prevailed.'

Acknowledgement

Before having started the Master of Business Administration, I have always felt that the impact that engineers and scientist made in the exact sciences were most profound of all sciences. New technology breakthroughs have changed the way we live in a positive and in a negative way. As an engineer I have also made positive changes using technology. When I ride my bicycle to work, I am satisfied to see that my innovative solution makes a positive difference for people driving by, the environment but also for the company that has had a good return of investment.

During several classes at the Erasmus University I began to realize that business management has a profound impact on society. It can change the way we live on a global scale by changing the social constructs of our own making.

With the realization that social reality can be changed, I began on this journey to discover the possibilities within business management and sustainability within AkzoNobel. I truly believe that the way we work and live on this planet can be improved and that the current well-being can be dramatically increased. For me, the key aspect to achieve this is to combine business management, sustainability and technology into added shared value.

This is the end of my journey becoming a Master in Business Administration. Special thanks are in place for the following people:

Prof. Rob van Tulder who said during my last class; ‘Don’t you want to make a difference during your thesis?’ To André Veneman and Caterina Camerani for allowing me to dive deeper into the sustainability strategy of AkzoNobel and Caroline Van der Werf who took the time to check my grammar. Thanks are also in place for the people within the WTC partnership for being open and taking the time to be interviewed. Good luck with this great initiative, I am confident that you can and will create shared value.

Last but not least, the impact this study had on my family was significant. Thanks my dear Linda, Rosa and Boaz for the time and support. You make me happy!

1. Introduction

'Corporate Social Responsibility gives the wrong message; sustainability is business and business is sustainability.' 'Business is done best when simultaneously generating economic, environmental and social impact' (André Veneman, Corporate Director Sustainability of AkzoNobel). This quote says a lot about the strategic intent of AkzoNobel.

In this explorative case study, performed under assignment of AkzoNobel, the Sustainable Development Goals (SDG's)[1] are chosen to investigate the practical use for social impact measurement of a new innovative waste to chemicals (WTC) partnership project in Rotterdam, The Netherlands. The new disruptive technology used by the WTC partnership changes the recycling and chemical industry by converting waste, which is normally incinerated, into valuable chemicals. Hereby trapping CO_2 and closing the carbon cycle as waste will replace the normally used fossil feed stream.

Figure 1: Presentation of waste to chemicals initiative and partners (Source: White paper V2.2, waste to chemical partnership, received on January 2017).

[1] https://sustainabledevelopment.un.org, consulted on 4 February, 2017

As can be seen in Figure 1, the WTC partnership is composed of several partners from the government and business. Partnerships like these are, according to many scientists and experts, the missing link to create a necessary transformation of the current economy. The central aim of many cross-sector partnerships is to solve economic, social and environmental problems through collaboration (Crane, 1998). For none of the companies or government departments the WTC partnership is core business yet together, when properly aligned, they can make a difference by combining their resources and create a sustainable advantage. As Teece (2007) notes in his article about dynamic capabilities; improving quality, controlling costs, lowering inventories and adopting best practices will no longer be sufficient for sustainable competitive success. The open economy with rapid innovation and globally dispersed sources of invention, and manufacturing capability needs dynamic capabilities to sense, and shape opportunities and treats. Company success demands the creation of new products and processes or the implementation of new organizational forms and business models which are driven by entrepreneurial managers. The way this partnership has been created is an example on how business managers and government leaders seize the opportunity to create new business. Multi-stakeholder partnerships that link the public, private and civil society sectors are one of the key methods to contribute to the SDG's (United Nations, 2015).

Changes in the way we do business are necessary to create a transformation of the current economy. A European Union think tank expects that the coming 20 years will be disruptive as power will shift from the West to the East and will be more diffuse. This on background of an ageing society in Europe, changing climate, a world population increase and technological revolutions that will create new patterns of society (Reflection group on the future of the EU 2030, 2010). A transformation is needed in the way we consume energy and materials but also how we live and work with our surroundings (Den Ouden, 2012). During this research it became apparent that the people on the frontline of scientific research and the WTC partnership are well aware of the transformation that will both bring challenges and opportunities.

AkzoNobel believes that when it will contribute to the SDG's, the current business model will be strengthened. With innovation as driver for new products and business models, AkzoNobel can tap into new revenues, lower environmental footprint and add value to society. Companies as AkzoNobel however face serious managerial and strategic difficulties in 'making it work' in practice (Van Tulder et al, 2014). Whereas the company's economics and environmental impact are measurable and benchmarking is possible, social impact is still in its infancy. Social impact is a critical sustainability pillar according to Elkington's triple bottom line (1998, 2004). The balance between economic, environmental and social goals will not only improve the long term economic performance of a company and its supply chains but also foresee in sustaining the well-being of the people and the planet. The challenge is to simultaneously add value to these three pillars when doing business so that stakeholder value maximization will be achieved. The stakeholder in this sentence has a broad definition and bigger impact as it entails the world and world population including shareholders.

This explorative case study for AkzoNobel will investigate how social impact measurements for the WTC partnership can be used to create shared value in a mature market. Case studies are empirical by nature and allow researchers to investigate certain phenomena in a real life setting (Yin, 1981). The WTC partnership is operating in a live setting and therefore a case study is most appropriate as it will give an elaborate insight in how business can adopt social impact measurements. Social impact measurements and partner research are also new in the field of research. The questions still lie in the area of how or why it should be done. This is another reason why a case study according to Yin (2003) is most appropriate for this thesis. This thesis will answer the following research question:

How can the measurement and use of social impact strengthen the core activities of the WTC partnership?

First various aspects of relevant literature are examined in chapter 5 to give the latest insights in sustainability, partnerships, strategic management and social impact. This is done to understand the reason why these topics should be of interest of AkzoNobel. Secondly the WTC partnership and strategic goals are explained in chapter 6. This makes a comparison possible with the strategic goals of the individual partners and the necessities of the local community. The necessities are described in chapter 7 and 8. Chapter 9 will show which and how relevant SDG's are chosen. In this chapter the PEM framework from Van Tulder et al. (2016) is used to show how individual performance, organizational performance, partnership performance and society effects can be analyzed and corrected during the partnership project using four impact loops. Finally, a value proposition analysis following the value framework from Den Ouden (2012) is made in chapter 10 by comparing the value proposition with and without the selected SDG's. The value proposition analysis creates an understanding of which value is currently foreseen within the WTC partnership and what the suggestions will add using the examples presented in this thesis.

The combination of the generated perspectives has given a holistic perspective that has enriched the outcomes of this case study research and will not only guide AkzoNobel into the integration of social impact measurements and the fulfillment of the latent business model within the WTC partnership, but it will also add scientific value by describing the route to implementation of this new phenomenon on a company level, in practice.

2. Background

It is generally accepted that modern economics started with the book 'An Inquiry into the Nature and Causes of the Wealth of Nations', in short referred by The Wealth of Nations published in 1776 by Adam Smith. At that time, just at the brink of the industrial revolution, it reformed the economic view and basically stated that the individual efforts of man will automatically and unintended have public benefits (A. Smith, 1776). It, amongst others, opened our individual society as we now know and gave people the freedom to rise above their upbringing. It stated that the only way to become rich was to 'simply' manage and keep incomes higher than the expenses one made. He stated that the economic system, when unintended and free, is able to regulate itself. The famous invisible hand would guide humanity towards a prosperous future.

Ecologist Garret Hardin published his article 'The Tragedy of the Commons' in 1968 (G. Hardin, 1998). Hardin started out with Adam Smith's 'Wealth of Nations' as a model but reconsidered after some time when he analyzed William Forster Lloyd's conclusions in the Oxford lecture of 1833. In his analysis he took Lloyd's hypothesis and portrayed this on shared pastures for cattle (the commons) which are left unintended. He argued that given the continuing population increase, the world's resources will be destroyed when the individualistic competitiveness of man would be left uncontrolled (G. Hardin, 1968). During this time, society saw the impact of the rising population and industry. Governments began to understand that it had to be controlled. After the first United Nations (UN) conference on the human environment in 1972 Stockholm Sweden, the reach of sustainable development governance has expanded considerably at local, national, regional and international levels especially after the publication of the report 'Our Common Future' by the Brundtland Commission in 1987. Perhaps, the increased attention was fueled by environmental disasters such as Bhopal (India, 1984) and Seveso in Italy (1976) which amongst other measures prompted the European Union (EU) to protect people and the environment against industrial accidents by creating the Seveso guideline. The popular concept of Corporate Social Responsibility (CSR) has been developed from a moral standpoint with the idea that business enterprises should also take some responsibilities to society beyond making profit for shareholders (Carrol, 2010). Economist and Nobel Prize winner Friedman (1962) was the biggest opponent of this idea by arguing that social issues were not the concern of business people but that maximizing profits were the sole responsibility of managers. The free market system should resolve any social issues and if these were out of reach, government and legislation should address the matter.

Now 45 years later after the first UN conference about the environment, continuous development has created seventeen Sustainable Development Goals (SDG's) which have superseded the eight Millennium Development goals (MDG's) which were established in 2000. The United Nations (UN) has drafted the SDG's in paragraph 54 of UN resolution (A/RES/66/288) together with the 193 member states. The SDG's give clear goals (to be achieved in 2030) to countries and businesses in developed and under-developed countries. These goals have been created with contributions from a great variety of people and organizations (Rianne van Asperen, Max Havelaar Lecture booklet, 2015). The SDG's have been adopted by the UN General Assembly on the 25th of

September and contains 17 goals with 169 targets covering a broad range of sustainable development issues. CSR is now gradually disappearing as a concept and is being added to standard business management.

AkzoNobel is one of the multinationals actively pursuing several of these SDG's by several projects as the 'Human City Initiative' and the 'Community Programs'[2]. These projects work through the efforts of AkzoNobel employees and help communities and cities around the world. Another way that AkzoNobel is contributing to the SDG's is by using its research capabilities in making new sustainable products that address local social and environmental needs. Products such as water based paint that has no solvents at the same time keeping the same quality as traditional paint. The water based paint is increasingly being used in the world due to the negative effects of the solvent based paints on humans and the environment. Another successful product line is 'Intersleek', a new biocide-free fouling control coating that offers fuel and CO2 savings of up to 6 percent (Annual Report 2016). These two examples show that innovation can deliver products that add economic, environmental and social value. It can be seen that AkzoNobel has sustainable goals aligned with their core business as shown below in a quote from the annual report (2016).

'In 2016, revenue from eco-premium products and services with downstream benefits totaled €2.9 billion, or 20 percent of total revenue. This means that we have reached our 2020 target for eco-premium solutions with downstream benefits ahead of schedule. This is a level that we plan to maintain as we continue to proactively drive the development of innovative sustainable solutions ahead of the mainstream in the market. In total, 11 percent relates to eco-premium solutions[3] with social benefits: health and well-being, risks and toxicity. Revenue from all eco-premium solutions totaled €3.4 billion, or 24 percent of total revenue.'

AkzoNobel strategic targets are aligned with sustainability but will this alignment have benefits compared with their competitors? Is it a good business strategy of AkzoNobel to be involved in sustainability? According to Porter and Kramer (Porter & Kramer, 2011) creating value for society by addressing its needs and challenges next to creating economic value is not philanthropy, social responsibility or even sustainability but a new way to achieve economic success. They call it 'shared value' because they can innovate through using new technologies, operating methods and management approaches to address societal problems and as a result, increase their productivity and expand their markets. The World Business Council for Sustainable Development published a field guide resulting from its 'Sustainable Livelihoods Project' (WBCSD, 2004). The description of almost 20 cases served to underline the fact that 'doing business with the poor' could help multinational companies (MNCs) to reach a largely untapped market of four billion potential customers (Kolk & van Tulder, 2006). This way of working is not philanthropy, but a corporate

[2] www.akzonobel.com/about-us, 2017
[3] Eco-premium solutions are products that are clearly more sustainable than the most common alternatives on the market. They are assessed in seven different categories: energy efficiency; use of natural resources/raw materials; land use; emissions and waste; risks (e.g. accidents); toxicity; health and well-being.

strategy that also makes economic sense and can give companies a competitive edge says Prahalad & Hart (2002) in their article; ‘The fortune at the bottom of the Pyramid. These days, renowned names in strategic management explain the strategic importance in achieving not only economic profit but also environmental and social profit. Also governments are convinced that the world has to take the next step and redesign the way we create wealth and well-being.

A big step has been taken and 193 member states agreed on the SDG’s but how are they able to meet the targets? Logically they can do this by reducing their footprint, by drafting new legislation, using more sustainable products and by demanding higher standards from their suppliers. The same goes for other multinationals as they too are looking for ways on how they can sustainably improve their value chain.

3. Problem description and research questions

Measuring the economic performance of a company is not sufficient to control a company as can be seen by environmental incidents and social and economic incidents that occurred because of naïve and or amoral behavior. Companies are an important part of our world and can have a positive, negative and neutral impact on its inhabitants. It is often said that 'What gets measured gets managed' and the three pillars (economic, social and environmental) are currently measured by AkzoNobel. However they have a different way of measurement and are different in their level of development.

3.1. Three metrics compared

Economic metrics are abundant and are measured and presented in the annual reports of multinationals for decades. The statement of income and balance sheet give elaborate and valuable information for stakeholders and investors about the status and prosperity of a company. All is summarized by economists in key figures which for example state the revenue, EBITDA, operating income, ROI and the earnings per share for a quick overview of the financial health and the effectiveness of the efforts. These metrics have been made during more than a hundred years of economic research by great names such as Marx, Smith and Coase and Ostrom and are still being refined and altered as the world is changing towards a global economy and governance is more important than ever. To report these metrics across companies and present them in the same transparent, accountable and efficient way, the majority of the world uses the International Financial Reporting Standards (www.IFRS.org). The figures are often shared every quarter and benchmarked by financial traders and shown in the various stock exchanges such as Amsterdam, New York and London.

Environmental metrics have started to be annually reported by the majority of companies from the 1990s and are basically made by using data from consumption and output figures which are documented by engineers. These figures are then converted to the companies carbon footprint expressed in equivalents of CO_2 (e) but also impacts as acidification, global warming and ozone depletion are calculated (Ditz and Ranganathan, 1997). However, various ways exist in how to measure the impact of companies on the environment and people. The most accepted way is by performing a Life Cycle Analysis. Coca Cola was one of the first multinationals that performed an elaborate study on the environmental effects of their packaging by performing a (LCA) in 1969. The way how to perform this analysis is prescribed in two ISO standards (ISO14040/14044) and a majority of software systems are in use to aid in the complicated calculations, assumptions and outcomes concerned with LCA. Next to commonly used CO_2 Equivalents also Tons of Oil Equivalent (TOE) is used for example by The European Chemical Industry Council (CEFIC.org). The ISO standard 14001 is used to voluntary track environmental performance and this is done by numerous companies instead of sustainable development (Ibid, 1997). From this short description on environmental metrics it can be seen that it is less known, less standardized and more scattered than the economic metrics. However, they are used with standards and are being benchmarked

through several institutions such as the DJSI for companies and the Environmental Performance Index (EPI) for a State's environmental performance which is developed and released by Yale University and Columbia University every year at the World Economic forum.

Social metrics are currently being measured by a lot of companies but there are currently no widely (institutional) agreed standards for measuring ethical performance (Azapagic & Perdan, 2000). AkzoNobel discloses inputs regarding Human Cities and Community Programs projects (e.g. number of employees involved, liters of paints used, people reached, etc.), the total reportable rate of injuries and a percentage for the number of female executives and high growth markets executives as well as the engagement score of their employees (annual report AkzoNobel, 2016). But the social impact of products, e.g. the marine coating, the water based paint, as a whole is not measured yet, due to lack of data available or standard methodologies. AkzoNobel has influence on the well-being of the world and its population and wants to measure it more precisely to determine the focus point of the strategic efforts that they are making. Azapagic & Perdan (2000), gave an example of social impact measurements in their generic framework for indicators of sustainable development. They propose that ethical indicators can be qualitatively stated in a statement to indicate the code of conduct and intergenerational equity, welfare indicators in the form an income distribution which is expressed in terms of income in the top 10% of employees compared to the bottom 10%. According to them, work satisfaction can be measured by the number of sick days and the number of happy people.

Compared to the economic and environmental measurements and metrics, social impact measurements are still in a developing phase. Implementing the use of social metrics is strategically important for AkzoNobel. By using social impact, AkzoNobel can sustain their competitive advantage and help to reserve and improve the way we work and live on this planet.

3.2. Research question

Before measuring social impact, this thesis focusses on 1) what goals to measure, 2) why to measure it, 3) how to measure it and 4) how to use the measurements. The WTC partnership project in Rotterdam serves as the basis of the case study to present a practical yet sound social impact methodology next to using social impact to see where the business model of the WTC partnership can be strengthened.

The research question therefore is:

How can the measurement and use of social impact strengthen the core activities of the WTC partnership?

1. **What is value?**
   Various perspectives and level of value are discussed to see what shared value is
2. **What is the strategic relevance of measuring social impact for AkzoNobel?**
   Why would AkzoNobel measure and use social impact?
3. **What is social impact?**
   Before we start to use social impact measurements it must be known what it exactly is.
4. **Which social metrics are currently measured by AkzoNobel and the partners within the WTC partnership?**
   Social data is measured but to what extend and are the WTC partners also measuring?
5. **What are the barriers within the WTC partnership?**
   Because the partnership, more opinions and strategic goals will need alignment to design the right set of metrics and goals. Getting alignment within the WTC partnership is critical to achieve new goals.
6. **Which social impact is needed for the location of the new WTC plant?**
   Social impact has a local perspective and not all available social impact measurements are needed. The Netherlands for example does not have a shortage of water but what do the people in The Netherlands need?
7. **Which SDG's fit the activities of the new WTC plant of the consortium and AkzoNobel?**
   The 17 SDG's have an elaborate scope and no company can add value to all of them, focus and fit with core business will ensure that resources and efforts undertaken with respect to social impact are implemented with focus and dedication.
8. **Which social impact method is suitable to be used?**
   Various methods are in use but which method fits the ambitions and characteristics for the WTC partnership and AkzoNobel?

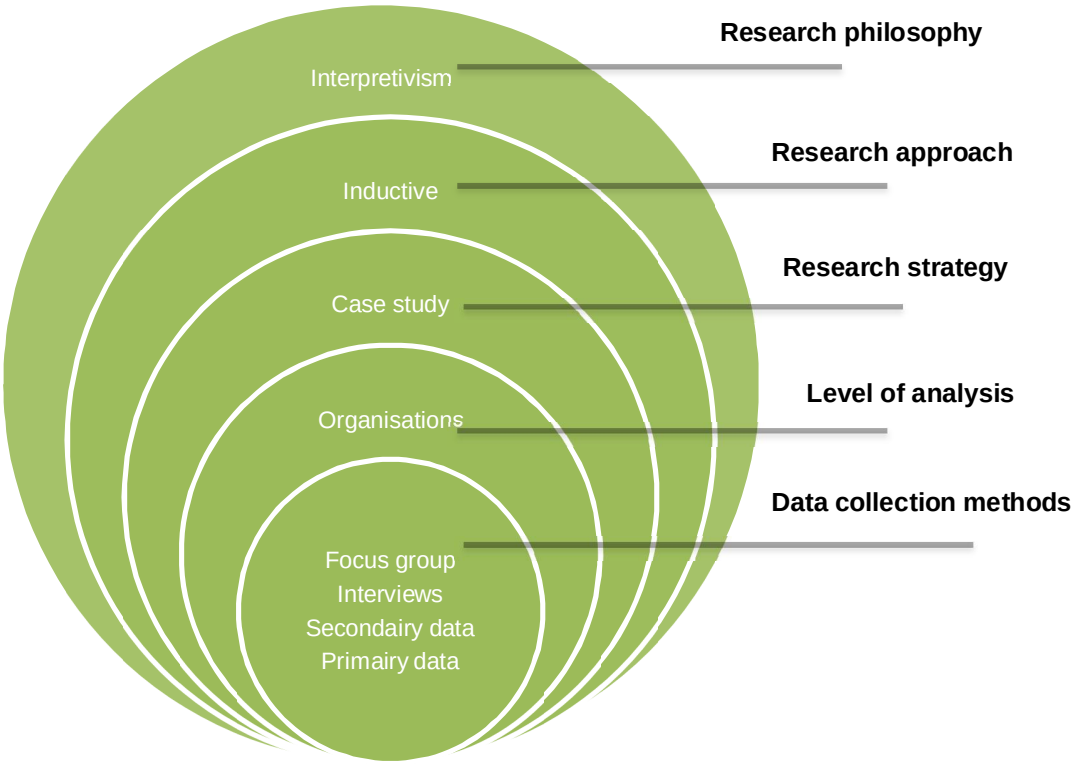
4. Methodology

This chapter describes the used methodology and research design that is used to effectively gain knowledge about partnerships and social impact metrics. Several concepts, philosophies and approaches determined the structure of this research.

Paradigm and research design

People are not autonomous but are formed, amongst others, through the unconsciousness, language and emotions. This way of thinking follows from the philosophy of interpretivism. The research approach is inductive as I want to leave room to create insight into the significance of social metrics for AkzoNobel, collect quantitative and qualitative data and use a flexible structure to allow changes in research scope during the study. This research strategy follows the principles of the case study and its elements, which offers us a holistic understanding of the situation. AkzoNobel, the partnership of the WTC project and in specific its social impact and the way the governments, NGO's and other companies can measure it social impact is the unit of analysis on which the investigation is conducted. In Figure 2, the 'research onion' of Saunders, Lewis and Thornhill (2013) shows a core display of the methodology.

Figure 2: Free interpretation of the 'research onion' of Saunders, Lewis and Thornhill (2013)



Research barriers

This research has had four major barriers: Firstly, because a qualitative approach is used for one part of the data, a small sample has been taken to gather research data. Secondly, even though social and environmental scholars often have an understanding on what social impact entails, the majority of interviewees were professionals from government and private parties and did not have an elaborate understanding of this topic. A large part of the interview was used to explain this novel concept and misinterpretation could have occurred during the interview. As described by Cohen and Levinthal (1990) people need to have basic knowledge of a topic before they can assimilate and understand it in detail. The third barrier was the availability of partnership companies and the available time to interview. One company was based in Canada. A skype meeting was held and for another company, the research was not allowed because of difficult and sensitive negotiations. Second hand information was obtained with respect to this last company. The fourth barrier is that I am an employee of AkzoNobel, possibly this could lead to less open conversations and interviews as not all information could be shared by the other parties. This thesis however, will give a broad understanding of the practical integration of social impact measurements within a multinational company and in the complex partnership in the Netherlands.

Research process

The preliminary research request on social impact measurements was made by the Corporate Director Sustainability of AkzoNobel and a team was formed within AkzoNobel to facilitate and guide the research so that available knowledge within AkzoNobel could be used. The well documented WTC project was selected as this would narrow the research scope but would still give good insights in how social impact measurement could be implemented and what added value it would give to the WTC partnership.

The case study was chosen as the best way to research this specific subject as it will give in depth knowledge of the studied organization and particular phenomenon (Van Tulder, 2013). The WTC partnership and the search for a method on social impact for AkzoNobel have not been researched extensively before. Therefore, this researched is governed by how social impact measurements within a partnership could work. Case studies are empirical by nature and allow researchers to investigate certain phenomena in a real life setting (Yin, 1981). According to Yin (2003), a case study allows the researcher to explore individuals or organizations, simple through complex interventions, relationships, communities, or programs. A case study design should be considered when: (a) the focus of the study is to answer ‘How’ and ‘why’ questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context. Because all of these criteria are met, it is an appropriate methodology to use in this research. The disadvantage of the case study is the loss of external validity of the results and the difficulty of reproduction (Van Tulder, 2013). Even though the research was done through a case study also a lot of quantitative data was used and this should be able to be reproduced.

The research started by examining literature to obtain a better understanding of the investigated topics and provided sufficient knowledge to discuss the research goals with specialists such as Ruut Veenhoven (Emeritus-Professor of social conditions for human happiness) working for the Erasmus Happiness Economics Research Organization (EHERO) who specialized in the subjective quality of life and with Professor Rob van Tulder, who is the academic director of The Partnerships Resource Centre and amongst others, specializes in public private partnerships (International Business-Society Management). A focus meeting was held with Professor Rob van Tulder, an Erasmus University researcher, the Corporate Director Sustainability of AkzoNobel, the Social Impact Manager of AkzoNobel and the Director of Planet Possible of AkzoNobel. Discussed themes were social impact, partnerships and the WTC project.

After this, more literature and secondary data such as annual reports and internet pages have been consulted to get an elaborate understanding of the involved companies of the WTC partnership and their strategic goals. As the partnership is established with government departments and private parties, the complexity of the first research question about social impact rose significantly to establish a specific set of social impact indicators. Partnership literature from the Erasmus University (Partnership Resource Centre) and partnership management tools used by the research team of Professor Rob van Tulder provided the majority of knowledge needed to oversee the details and difficulties concerning partnerships.

The WTC project leader introduced the other partnership project leaders to this research and provided all the (confidential) WTC project information about the partnership such as structure, agreements, organization diagrams, strategic targets, BID book and a white paper.

Because of the importance of local circumstances for social impact measurement, various global databases and government internet sites on social factors concerning countries and areas were investigated. Furthermore, several social impact methods and organizations were consulted to get a detailed understanding of the current state of social impact measurement. The managing director of a consultancy and software provider called Sinzer have been interviewed who specializes in social return of investment (SROI) and a company called Pre-sustainability who created a handbook on product social impact assessment. AkzoNobel social impact (sustainability) researchers were frequently contacted to get a more in depth understanding of the current state of social impact science next to Dr. Steen from The University of Göteborg. He was consulted to acquire more information about quantitative research on social impact monetization.

After the first three semi-structured interviews with the project leaders of the WTC partners the semi-structured research questions were made less detailed. This was done due the missing needed specific knowledge of the interviewees on social impact. Also, the interviews were changed in time as research progressed and created more detailed and focused questions. The latter interviews focused more on company or governmental goals with respect to social impact and barriers in the partnership collaboration.

After getting a general understanding of the topic, the literature research, research from secondary data, project member interviews, expert opinions and knowledge on the current state of social impact measurement, a fit was made linking all the information. This created a detailed understanding on social impact measurements in partnerships.

Retrieving and crafting data

Several ways of collecting and crafting data were used during this research. Each of these methods will have certain advantages and disadvantages.

Literature reviewing has firstly been done to gain a general understanding of recent social impact measurement, strategic relevance and on sustainability in general. The Erasmus University Library, Erasmus research database (RePub), Web of science and the happiness database (Veenhoven, R., World Database of Happiness, Erasmus University Rotterdam, The Netherlands Assessed on (June 18, 2017) at: http://worlddatabaseofhappiness.eur.nl) were used by using the following search words: social impact, value creation, social sustainability, partnerships and social measurement. Snowballing was done several times after interesting articles were found. Also, suggestions were followed from consulted experts on not to be overlooked literature such as books or important authors in this specific topic.

At the start of the research a *Focus group* was organized to retrieve data around the thesis and to create a general outline of the research subject. The focus group meeting was held on a semi-structured way to guide the conversation so that the right topic could be discussed but without removing the space needed to get the participants to express their views and respond to the ideas of those around them. It has been taken into account that social pressure can influence the response and people might not be willing to air their views publicly or are shy to do so (Easterby-Smith et al, 2015).

Textual data has been retrieved from annual reports, the internet and retrieved from the project team. The (confidential) data provided by the project team gave valuable insight in the set-up, goals and structure of the WTC project. The annual reports and internet pages of the WTC partners were an easy way to retrieve an abundance of information. However, the annual report is primarily made for the stakeholders and may not show the complete picture about a company. Also internet creates a distorted view on what a company has to offer and cannot be mistaken to tell the whole truth. To get a good idea about local circumstances open data sources were used on the Netherlands, Province of South of Holland and Rotterdam were used.

Interviews were held on a non-directive or semi structured manner. The first interviews were more structured than the latter as a better insight was obtained and more flexibility was needed to get the most out of the remaining interviews. Effort has been taken not to steer the interview too much as tailoring of uncovered interesting areas could be missed. Some meetings were followed by second meetings within the company to get more information after the research progressed or to interview another employee with more detailed knowledge. The meetings with Port of Rotterdam, City of

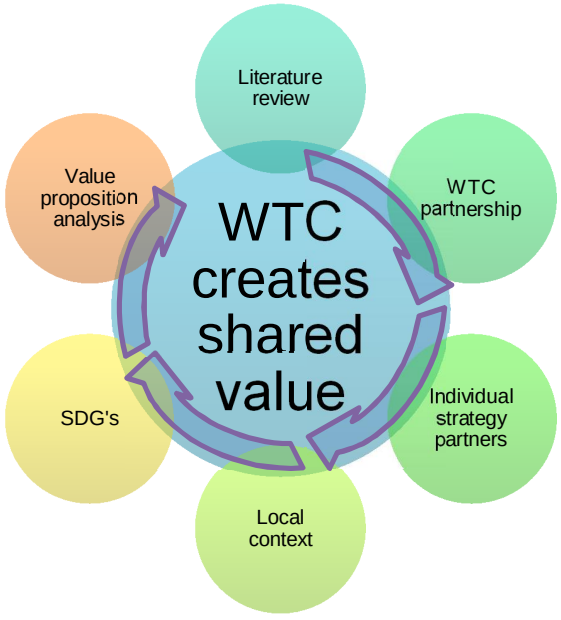
Rotterdam (2 persons), AkzoNobel (6 persons multiple times), Province of South Holland (3 persons), Innovation Quarter (1 person), Renewi (1 person), Sinzer (1 person), Professor Rob van Tulder (Erasmus University) and Professor Ruut Veenhoven (Erasmus University) were all face to face. One interview was held by telephone for Enerkem (1 person). The interviews with the project members and the focus group meeting lasted for 60 minutes to 90 minutes, were transcribed and can be seen in appendix C.

Combining data to obtain holistic perspective

The literature has given direction and understanding of the concepts, positives and negatives around the topics of research. A broad investigation as not only value but also partnerships, social impact and social impact measurements had to be understood.

The interviews and data obtained from the WTC project has given a more detailed and specific understanding of the individual partners and the WTC project as a whole. The strategy of the partners and the WTC project are an important part to get buy in from each partner when selecting social goals. Using the strategy and by investigating the local circumstances near the WTC plant in The Netherlands, relevant and acceptable social impact goals could be selected using the SDG's as basis. The selected SDG's should also add value to the value proposition of the WTC project as this will complete the business model. Three selected SDG's indicators are used to show which social impact valuation method is suitable for the WTC partnership and AkzoNobel. A strength and weakness overview has also been given per valuation method to show potential pitfalls of the method. Finally, a value proposition analysis is made by comparing the value proposition with and without the selected SDG's. The combination of these perspectives has given a holistic perspective that has enriched the outcomes of this research. Hereunder in Figure 3 the followed holistic model.

Figure 3: Holistic model of this thesis.



5. Literature review

In this chapter, various aspects of relevant literature are chosen to give insights in the thinking behind this thesis. Not only the latest sustainability focused research but also recent knowledge obtained from general business administration research is used to frame this case study. Social impact measurement is part of a bigger perspective within sustainability. The context has to be understood before the details of the subject of this thesis can be understood properly.
In chapter 3.1 the concept of value is entwined to show various forms on how the WTC project can add value or deduct value from its operations. Knowing how value is perceived and what kinds of value exist is essential to establish an understanding on which value is created by the WTC project and which value is missing. In chapter 5.2 the business case of sustainability is investigated to determine what the benefits are of creating a sustainable company. Important here is to also get an understanding of the known challenges for a company endeavoring to become more sustainable. Chapter 5.3 describes the foundation of social impact as this is the topic of interest. What is social impact, why do we want or have to measure it? This is an important step before actually measuring social impact which is described in chapter 5.4. Various complicated and less complicated methods are being used in the world but what is useful for AkzoNobel and the WTC project? The WTC project is made out of a partnership and is therefore more complicated than a single company to manage. However a partnership also has more potential to cover the array of sustainability. Chapter 5.5 describes both the complicated nature and potential of partnerships after which chapter 5.6 covers both partnerships and social impact to close the perspective needed in this thesis about social impact measurement in the WTC partnership.

5.1. Creating shared value

The WTC concept is about creating value through innovation and this thesis is researching social impact to create shared value. But wat is meant with shared value? Value in the British dictionary[4] is as superficial as the amount of money that can be received for something.
Creating shared value becomes difficult when the definition of value has not been clearly understood yet. Literature has various explanations for value and often research uses the term value from the context of the researched subject and the discipline that describes it. For example, research on culture will look at value artistically and look how paintings create value for the beholder or how values are different in other cultures. Otherwise, research on economics will primarily look at the value created by companies and will express it in a currency. Business on the other hand will typically see value as an offering of a product and a long term business model that foresees in the longevity of the company. When sustainable and a balanced society is the end goal of our efforts, a dramatic transformation of the current paradigm is needed. Partial solutions are not radical enough to solve the serious societal problems of climate change, over population and the depletion of natural resources in our world. This sounds quite dramatic but it will also create opportunities if various levels of value and value perspectives are understood. This way, a

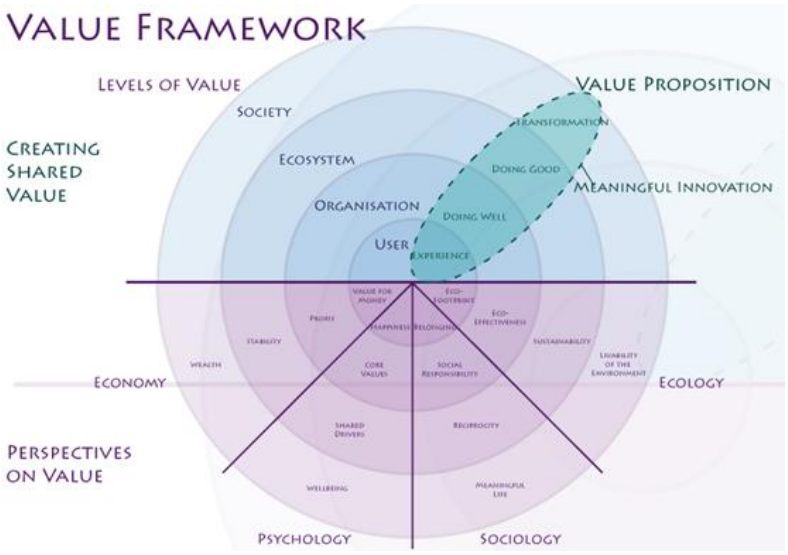
[4] http://dictionary.cambridge.org/dictionary/english/value, accessed July 2017

meaningful value proposition can be created that will help transform our current society (Den Ouden, 2012).

The book 'Innovation Design' by Den Ouden is focused on how innovations can foresee in the necessary transformation by determining the different levels of value which the new innovation is addressing. Economic value means profit in an organization and stability for an ecosystem (partnership) but for psychology these are core values for organizations and shared drivers for an ecosystem. The book gives an elaborate review on value from an economic, psychological, sociological and ecological perspective. The different levels and perspectives together create a holistic view which is useful to look at innovations on how they create value and on what level of society it is focused. A short explanation of the framework value perspectives: For a user value is provided by economic value through value for money; psychological value for happiness; sociological value through a sense of belonging; and ecological value by reducing the user's footprint (Ibid). A meaningful innovation in an ecosystem (similar to partnership and network) would propose the creation of ecosystems that can adapt to inherent changes and dynamics over a longer period of time and keep providing value for all stakeholders. The summit of shared value creation is to create a so called meaningful innovation that adds shared value to all levels in all 16 segments of the value framework. They aim to simultaneously address economic, psychological, and ecological value. The shared value creation will improve quality of life for society and care for people and planet, create lasting value for stakeholders, provide an opportunity for sustainable value for organizations and create a pleasurable behavior changing experience for individuals.

In chapter 10.1 the elaborate understanding of value which is portrayed in the value framework in Figure 1 will be used to analyze the value created by the WTC project and also indicate where value is missing but that could be added.

Figure 1: Value framework from Den Ouden (2012).



5.2. Business case of sustainability

The book 'Managing the transition to a sustainable enterprise' from Van Tulder et al. (2014) is used as a guideline to establish a better understanding on what the strategic value is to steer towards a sustainable business model. In their book the mayor management disciplines of business are used to show the added-value of a sustainable business model.

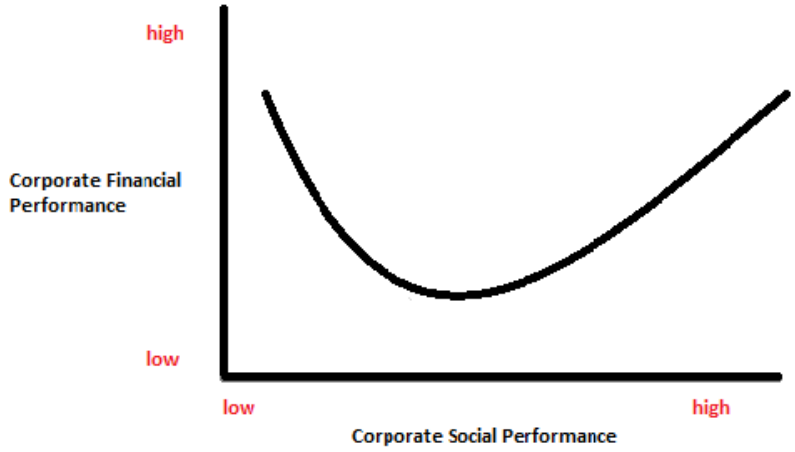
Four basic starting points can be used to simply sort out differences in the sustainability business case (Van Tulder and Van der Zwart, 2006):

1. The classic business case: where doing more with less provides a direct financial profit and investments are following standard financial returns;
2. The defensive business case: where sustainability is used to mitigate future risks caused by changing consumers or stricter legislation;
3. The strategic business case: where a long term global vision on change is used to steer the company towards a more sustainable future to ensure a competitive position and survival.
4. The societal business case: where new sustainable value creation and innovation is introducing new business models to foresee in the needs of the world by forming partnerships and system transitions.

Kurucz et al. (2008) categorizes the business case of CSR in four similar arguments: reducing costs and risks, strengthening legitimacy and reputation, building competitive advantage and creating win-win situations through synergistic value creation.
Extensive research has found a positive relationship between financial performance and sustainability performance (Margolis and Walsh, 2003; Orlitzky et al., 2003; Hull and Rothenberg, 2008; Russo and Fouts, 1997). Some others argue the results obtained with methodological flaws are nonlinear and others question the causality of financial performance (Peloza, 2009). Are companies who are profitable engaging in sustainability or are sustainable companies more profitable? The relationship between financial and sustainable performance is obstructed by an innumerable of contextual factors such as firm size, industry, economic conditions and regulatory environment (Peloza, 2009). As Margolish and Walsh (2003) say in the concluding part of their paper that personal values and commitments will no doubt orient the theories we prefer and the questions we ask.

So it seems, the direct business perspective is somewhat ambiguous but Van Tulder et al. (2014) shows, that when looked a level deeper, methodological barriers are gone, and ecological and financial performance can be correlated. Companies have to move through a transition phase to acquire the financial benefits from their sustainable efforts. Van Tulder et al. (2014) argues that this U-shape (Figure 4) could be caused because the investments in sustainability are not paying off or that this is a phase of the transition.

Figure 4: The U-shaped correlation between financial and societal performance (adapted from Van Tulder et al. 2014).



This U-shape curve also closely resembles the proverbial 'stuck in the middle' from Porter (1980) where differentiation and cost leadership are two successful generic strategies that are both beneficial if followed to the fullest. Using both strategies tends to paralyze the business as no clear guideline can be seen by employees or customers and stakeholders. A firm which gets 'stuck in the middle' is the consequence of the unwillingness to make choices about how to compete (Ibid) Sustainability in the broadest sense can differentiate business but the company's sustainable business concept has to be aligned to create a competitive advantage. Now more than 3 decades later Porter (2011) has coined the term shared value which could generate economic value by creating societal value by reconceiving customer needs, products and markets, redefining productivity in the value chain and enable local cluster development.

Germany's TeamBank is a good example how a has become a profitable role model for fair dealing by building fairness into the entire business model (Loch et al. 2012). The Teambank transformed from a conventional bank (Norisbank) and made its strategy work by embedding fairness into their entire value system such as in processes, innovation and the culture of the organization. In 2012, TeamBank was challenging the leading cash loan provider in Germany (Banco Santander) and in a flat market, had a growth of 17% (2011) without offering the lowest interest rates.

Also Van Tulder et al. (2014) indicates that a well-structured (and sometimes a bold sustainable strategy) that reaches every part of the organization next to external stakeholders is key to achieve alignment and be resilient in times of crisis. Amongst others; purchasing, HRM, Finance, R&D, supply chain management, portfolio design, business models, leadership and alliance management can all be shaped towards a sustainability strategy by also using business research. Supply chain research done by Carter and Rogers (2008) argue that doing good by undertaking efforts to

improve environment and social goals without a clear and explicit recognition of the economic and strategic goals of the firm is socially irresponsible. The framework is based on Elkington's triple bottom line (1998, 2004) which simultaneously considers and balances economic, environmental and social goals from a microeconomic standpoint and is complimented by perspective aspects of risk management, transparency, strategy and culture. The framework argues that operating within the intersections of economics, environment and society will improve the long term economic performance of an individual company and its supply chains. But getting there from having a 'conventional' economic strategy or business model could be a drain of resources and could also damage the firm, if managed improperly.

Strategic management research from Goshal and Bartelet (1996) showed that companies in transition tried to change too much and failed. Companies who took a phased approach to a transition, changed people's attitudes, assumptions and behaviors and created organizational clarity were successful in strategic renewal. Volberda et al. (2001) pointed out four fundamentally different journeys to foresee in the environmental change of the market and state of the organization and has close resemblance with the transition that Van Tulder et al. (Ibid) describes. Depending on the assumption that managers have the power to change the environment or not, transformational renewal is needed for changing industry rules or emergent renewal to follow industry rules. The configuration school known from Mintzberg (2009) and Miller (1999) builds a constellation of organizational elements that unitedly work together and form a powerful harmonious entity. In short steps, (1) make a bold move towards the direction of the company and (2) make sure the resources, means, market and cultural support strengthen the organizational effort in harmony. Looking at the titanic research done in the last five decades and the complexity of business management it is not strange to see no unquestionable correlation can be found between sustainability and financial performance. To make sustainability work an alignment is needed with the core capabilities and has to be integrated throughout the organization (Yuan et al., 2011). To move from a conventional financial business to a sustainable business in all its aspects, the transformation concerns all aspects known within business. This daunting task could be accelerated by standing on the shoulders of our predecessors in various business disciplines and by working together to combine business knowledge with company expertise. The next parts of this thesis will be used to look deeper in the field of social impact as Wood (2006) also strongly suggest. He states that not the way sustainability affects the firm must be examined but focus is needed on how firms affect stakeholders and society.

5.3. Social impact

According to Aristotle (384 B.C.) humans are naturally equipped to live in communities because this form of living will grant them the necessary and sufficient conditions to achieve happiness and a good human life. When humans would deprive themselves from social contact, he argues that they would not be humans but an animal or god. The reason is that humans have the capability of 'logos', rationality in thought and language. Humans are therefore capable of expressing themselves in language to give judgement about benefits or loss, about what is just or what is wrong. The human capacity to do this makes him perfectly equipped to live in communities, because the mere existence of this form of society depends on this very capability (Aristotle, by Hupperts & Poortman, 2015). After Aristotle, thousands of years passed by but this simple of human nature by Aristotle perfectly explains the essence of humanity and social life. We are capable of expressing and judging of what is wrong or good in our community and need social life to prosper and make our lives enjoyable. In present times, the international association of impact assessment (IAIA) has an elaborate definition of social impact assessment:

'Social impact assessment includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions' (Vanclay, 2003).

This definition of social impact assessment not only addresses social impact assessment but also underlines the possibility of measuring and managing social impact by predicting the outcome of a certain planned intervention.

It is important to note that social impact is not based on activities and output of organizations but on the actual effects on society as a result of efforts or activities undertaken by organizations (Maas, 2009). The WTC partnership will be used as an example to explain this further and explain that social performance is closely entwined with environmental and financial performance. The WTC partnership in Rotterdam will have a positive social impact as it will bring prosperity as a source of employment. It is expected that around 50 direct and 150 indirect jobs are created and the way the employers are treated can create positive or negative social impact (Source: WTC white paper V2.2). Pushing employees to work long hours, for unfair wages, in work circumstances that are unhealthy could still give some short term positive financial impact. This is however shadowed by a negative impact as their general well-being will be lowered that will in turn lower the productivity.

The power of the triple bottom line concept from Elkington (1998) should create value across the three dimensions of sustainability and not just on a social or environmental level. Balancing the dimensions is the challenge of the organization. Looking outside the company, the WTC plant will have social impact on its surroundings as it will use important resources such as air and water to conduct its business. Chemical processes are also a possible source of risk as incidents with

chemicals at this scale can cause a severe negative environmental, social and financial impact. Incidents that caused human life and changed the way we work with the production of chemicals such as Bhopal and recently with the substance of Gen-X of Chemours in Dordrecht (The Netherlands) show that taking substantial precautions are necessary to ensure a healthy and safe environment for the people working and living near a chemical plant. These precautions take away company resources in manpower and finance and from a firms perspective may seem bothersome. Klassen and McLaughlin (1996) however found that environmental performance was rewarded in the marketplace and devaluation was seen when companies came into environmental crisis. In another study Klassen found significant improved manufacturing performance when environmental technology was used to prevent pollution (Klassen and Whybark, 1999). Next to doing good for society this indicates that it is also an efficient, risk mitigating, business strategy.

It is a wicked problem as the chemical industry is on one hand creating a positive impact by making products that prolong and improve the quality of life, but on the other hand the production and disposal of chemical products can cause harm and a lower quality of life because of emissions to the environment. Events like these will in affect also harm economics and therefore it can be stated that a direct relationship exist between the three pillars of social impact, environmental impact and economic impact.

Current global paradigm in measuring national and global welfare

Before getting into measuring social impact it is important to understand the current macro-economic way we are measuring progress or welfare as this also has a big social impact. The definition of welfare according to the British dictionary is: health, happiness, prosperity, and well-being in general. Even though knowledge is rapidly increasing on environmental and social impact, the dominating KPI (key performance indicator) to indicate welfare or economic growth of a country, is still the GNP (Gross National Product) or NI (National Income). The GNP or NI was devised in the thirties when the environmental impact of production was not seen due to the low production quantities and seemingly limitless supply of natural resources (Hueting, 1980). In Hueting's book (1980) 'new scarcity and economic growth' he stipulates the relationship between economic growth and the costs for environmental impact (social impact included).

'The paradigm, through this indicator, obstructs hidden economic costs and is making humanity steer the wrong way towards environmental destruction' (J. Tinbergen and R. Hueting, 1991).

The problem statement of this thesis is therefore not a social or environmental problem but an economic problem that has tried to be solved by adding a new paradigm; sustainability. Humans are dependent on the environment if we agree or not. Besides this, the world economy is still focusing that the NI or GNP must increase without looking at the environmental costs. This is simply theoretically incorrect as economy growth is based on an increase in welfare and this not only depends on goods and services made by man but also on environmental goods as clean air, healthy forests and water, even though they are not man-made. Hueting (1980) explains this through the simplest economic fact that when goods are scarce, more of one means less of another.

When air is taken as an example this can be translated into the use of air as sink for chemical emissions from factories and the air needed to breathe. The air is used more frequently because of production growth and population growth and will eventually become scarcer.

Looking back at his theory and current affairs in China it can be seen that this theory is correct. The air pollution in China has risen dramatically amongst others because of the production increase over the last decade and the pollution that came with it. Canadian air from the Rocky Mountains is now being sold per bottle for 100 yuan (10 euro). The bottled air is 50 times as expensive as water[5]. This vicious circle could even raise the GNP as measures as gasmasks are being produced to prevent health effects. Friedman (2009) states that when the earth and its resources has transformed into a flat crowded and very hot place this will have highly negative economic, health and national security implications. The markets will have failed in underpricing goods and services by excluding the price of their externalities.

Hueting (1980) argued that environmental damage because of growth should be taken into account when looking at welfare as shadowed costs. He therefore developed an alternative for NI, the environmentally Sustainable National Income (eSNI). 40 years after his first book (1974, in Dutch) this has not yet been used by governments. There have been attempts to correct the flaws of GNP with a number of alternative indices. ISEW (Index of Sustainable Economic Welfare), NEW (Net Economic Welfare) and GPI (Genuine Progress Indicator) have been developed but are not practically being used to date (Azapagic & Perdan, 2000).

[5] www.telegraph.co.uk/news/worldnews/asia/china/12051354/Chinese-buy-up-bottles-of-fresh-air-from-Canada.html

5.4. Measuring social impact

The social impact measurement of well-being

When social impact is studied from a higher perspective, the ultimate social impact measurement is the measurement of happiness or well-being. Generally, well-being interprets the quality of life in society and happiness is the state of life of a single person. It is however often mixed and used both. For ease of argument happiness will be used to discuss this topic further. Aristotle reasoned that happiness is the ultimate goal of humanity as there is no other goal greater than happiness. People want to be rich to become happy, but people do not want to be happy to achieve something else. No other personal goal logically stands above the pursuit of happiness (Aristotle, by Hupperts & Poortman, 2015). Emeritus Professor Ruut Veenhoven has studied and measured the subjective well-being of people and has built a database[6] with evidence based research on happiness.

Happiness or well-being is measurable and scholars throughout the world are performing research to see what affects well-being and how it can be improved (Veenhoven[7]).

According to Veenhoven (2000), happiness including the length of one's life is the best summary indicator to measure the four different qualities of life; livability of the environment, life-ability of the person, utility of life for the environment and appreciation of life by the person. Happiness is easier to achieve in countries with economic freedom, good education, tolerance towards minorities and wealth. It is more difficult to achieve in corrupt countries, with unequal income distributions and lacking gender equality (Veenhoven, 1993). Countries such as France through Prime Minister Sarkozy and England through Prime Minister Cameron have recently started to measure happiness and put it on the political agenda[8].

Research that can be found in the database has proved various correlations of external circumstances that have an effect on well-being such as subjective well-being of air pollution and the relation between subjective well-being and employment/unemployment. Ferreira et al. (2013) studied the effect of life satisfaction and air quality in Europe and found a negative and significant relationship between air pollution (SO_2) and individual self-reported life satisfaction. An increase in SO_2 concentration of 1 ug/m^3 is associated with a reduction in life satisfaction of between 0,016 and 0,030 points on an 11-point life satisfaction scale. Unemployment is one of the most destructive life experiences (Stavrova et al. 2011). Not only does it affect one's subjective evaluation of life (Gerdtham &Johannesson, 1997; Gerlach & Stephan, 1996; Kassenboehmer & Haisken-DeNew, 2009; Marks & Flemming, 1999 from Stavrova et al. 2011), it is also associated with physical and mental health problems (argyle, 1989; Axelsson & Ejlertsson, 2002; Gallo et al.,

6 Veenhoven, R., World Database of Happiness, Erasmus University Rotterdam, The Netherlands Assessed on (June 18, 2017) at: http://worlddatabaseofhappiness.eur.nl.
7 Interviewed at the Erasmus Happiness Economics Research Organization (EHERO) on March 27, 2017.
8 www.vpro.nl/programmas/tegenlicht/rendementvangeluk.html.

2006; Goldsmith, Veum, & Darrity, 1996; Gordo, 2006; Korpi, 1997; Noh, 2009. from Stavrova et al. 2011)

There are limitations to the research of well-being as the context around what affects well-being is difficult to grasp. Within the company well-being can be measured with some provisions on externalities but outside the company or to measure the effects of a product, there are too many externalities that influence the measurement. Furthermore, the effects of certain factors are personal and cannot be taken as a general assumption even though there are some general basic necessities for well-being such as health and social contact (R. Veenhoven[5]). The direct effect of the WTC plant therefore cannot be easily measured on its surroundings but can be done for measuring the well-being of the WTC personnel.

At the moment, the majority of happiness measurements are being performed in healthcare and this is all new. In a nursing home you can measure how bad or how good the people are doing and compare between elderly homes how they do it. The nursing homes are currently evaluated on a few quality issues, but that is the number of m^2 and complaints of family or family surveys, it becomes clearer to managers that isn't all there is, you have to look at grandma's happiness and how long she lives? First look at the result of happiness, and then look at the m^2 and number of complaints to see if the circumstances can be improved (Veenhoven[9]).

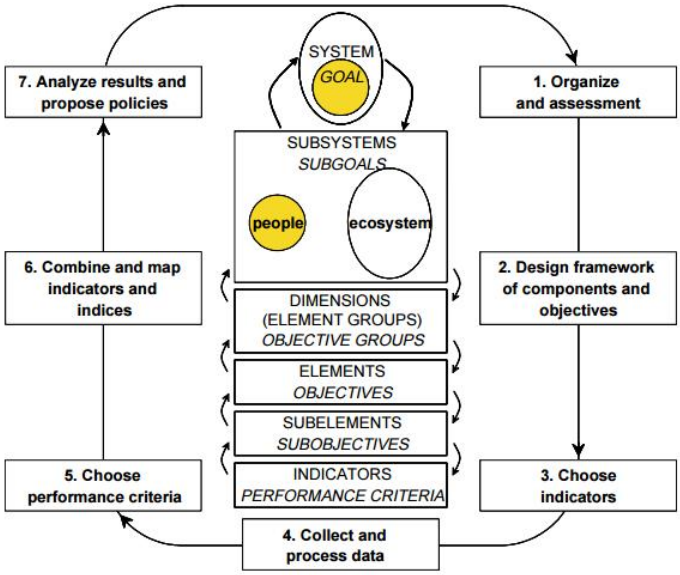
Methodology paradigms and social impact methods

The work being carried out on sustainability indicators (including social indicators) has become an industry of its own according to King et al. (2000). The literature on sustainability indicators is separated into two methodological paradigms. The first is expert-led and top down and the second is community based and bottom-up. Expert-led and top down has its epistemological roots in positivism and uses qualitative indicators and is used in biology and economy whereas bottom-up has its roots from constructionism and uses conversations and narratives to understand local context to set goals and establish priorities. This method follows from the social sciences (Bell and Morse, 2001). While these approaches are fundamentally different, there is an increasing awareness and academic debate on the need to develop innovative hybrid methodologies to capture both ways of gathering information (Batterbury et al., 1997; Nygren, 1999; Thomas and Twyman, 2004. From Reed et al., 2006).

Top down approaches have advantages because they provide a more global assessment of problems. This is increasingly important in the light of climate change models that suggest the poorest most remote communities are more vulnerable to external treats that lie outside community understanding (IPPC, 2001 from Reed et al., 2006). In contrast, the bottom-up approach provides a more contextualized understanding of local issues and places the investigated community in its relevant regional or global context (Reed et al., 2006).

9 Interviewed at the Erasmus Happiness Economics Research Organization (EHERO) on March 27, 2017.

Figure 5: Outline of the 'Well-being Assessment' used to engage communities in forestry planning in Western Canada. Adapted from (Prescott-Allen, 2001), from Fraser et al. (2006)[10].



An embedded case study from Fraser et al. (2006) dived deeper in the hybrid methodology and one of the three cases was based on forest management in Coastal British Columbia, Canada. It involved a process of engaging stakeholders to identify sustainability indicators after an extended period of conflict over perceived mismanagement of local resources. The process of selecting indicators was designed to create a baseline of information so that the impact of new and improved forest management practices could be monitored. The 'Well-being Assessment' methodology, created by Prescott-Allen (2001) was used to provide a rating of community, regional or national well-being. It combines ten categories of social and environmental indicators (five of each) into a single matrix (Figure 5).

To conduct this well-being assessment, an information team established a process that brought together scientific experts and community members (25 meetings) to agree on what data to collect and how data should be interpreted. Representatives from native Indians, other local communities, government, and forestry companies were involved to decide on relevant variables that would be inputted into the various categories that make up human and environmental well-being. The selected indicators were reviewed to determine what specific indicators represented environmental and human well-being in their regions. By comparing each of these indicators against the provincial, national, and international averages, the technical committees were able to assign

[10] Steps 1-7 (listed on the outside of the figure) identify the steps in the community consultation process. The figure inside the diagram outlines how indicators are aggregated into a final overall assessment.

scores for each indicator, categorizing each from excellent (given a score of 100%) to poor (0%). Overall, the role of public participation in this exercise was a mixed success. The involved process of community consultation proved extremely time-consuming and expensive and this, combined with immense data tables and twisted results meant that by the time work on the assessment was complete, the utility of this tool was diminished. The tool itself was perhaps too elaborate and will need a lot of resources but the method itself proved to be valuable as it gave a voice to the normally unheard native residents of the area and provided a forum through which to engage policy makers. To adequately set goals and determining indicators both scientific and participatory methods are necessary to sufficiently address global and local social issues (Fraser et al., 2006; Reed at al., 2006).

Measuring social impact can be done in various ways. Maas (2009) built a classification scheme with characteristics of social impact methods based on the framework developed by Schaltegger et al. (2000) and the categorization from Clark et al. (2004). Maas (2009) divided social impact measurements into three pillars; new value creation, value integration and value redistribution.

New value creation is obtained when products or services are made that did not exist or when it replaces an existing technology for a similar but more efficient technology. At the WTC plant new value is primarily created by R&D according to this vision. Measuring new value is difficult especially when it involves a technology that is too different from the one it is replacing. Also new products can have other effects than expected and a longer timeframe of analysis is needed to measure the eventual social impact as society often needs time to adapt and change to the new possibilities (Maas, 2009).

Value integration is all about stakeholders and participatory decision processes and is therefore most relevant for offices and sites and this thesis. At the WTC plant, value integration can be measured in how the personnel and public perceives the WTC contribution to its surroundings. The social impact created by the WTC project cannot be measured by the WTC consortium alone but it has to come from the several stakeholders. Companies that intend to operate sustainably must be prepared to commit to stakeholders to create social value (Van Tulder et al., 2014).

Value redistribution includes the effort of a firm to change the distribution of impact over the system actors (Maas, 2009). Redistributing value throughout the business is done to prevent the misuse of power in the supply chain. Especially in developing countries, the WTC consortium, with powerful partners, has the power to obtain products at the lowest price without for example looking at labor conditions or financial impact.

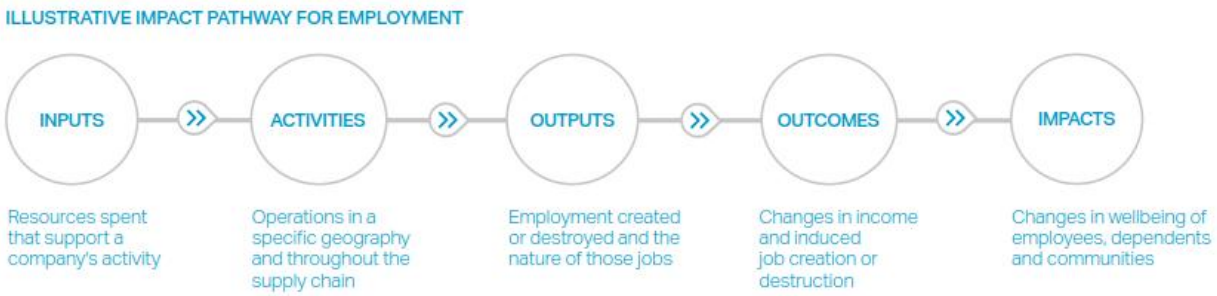
Social impact measurements can also raise conflict between different perspectives. As an example, human capital indicators (which are also used as economic indicators) have to be interpreted carefully. From a macroeconomic perspective the government would like as many jobs as possible but from a commercial microeconomic perspective having a lot of employees does not create an efficient process. Also, in developed countries, the employment rate could be high but the people

are not payed as much as in developed countries next to the fact that working conditions could be far from humane. One way to reduce employees is to install machines but they also need environmental resources (gasoline, electricity, air) and in this case a lower employment rate is associated with higher environmental burdens (Azapagic & Perdan, 2000). Not all the trade-offs can be omitted but these bottlenecks can sometimes be prevented by adding compensating indicators that focus on the weak points of the governing context.

A more recent and practical method to create social impact for business is the Social Capital Protocol (SCP). The SCP is a new initiative from the World Business Council for Sustainable Development (WBSCD) that aims to mainstream the measurement of social impact for business It shifts the consideration of social performance from an optional extra to a core part of business decision-making (WBCSD, April 2017). It works with four iterative stages which frame, scope, measure, apply and integrate social capital. These four stages are divided in twelve steps that act as an elaborate guide for business leaders and social impact professionals. The method of measurement and selecting the relevant valuation technique of the chosen social impact indicator for the WTC project will be explained and applied for the WTC project in chapter 5.8. The biggest difference with the SGP and this thesis is that the SGP focusses on how social capital can be of value for the business where this thesis works with an inverse materiality and triangulation by investigating; 1) the local social needs and linking this with the strategic intent of 2) the company and 3) partnership.

The SCP uses a so-called impact pathway (Figure 6 shows an example for employment) to trace back valuable inputs and resources back from the intended goals. For several reasons this is important as it will ensure that companies are not wasting time and resources but also can detect unintended and undesirable consequences. It can also be used to demonstrate links between a business activity and downstream impacts. For example, to prove to the government that have granted subsidies that the efforts of the company are making a contribution to the intended and agreed upon societal goals. A partnership will complicate this pathway further as multiple companies will spend resources have influence in achieving the goal. Chapter 9 will elaborate on this further.

Figure 6: Elements of an impact pathway. (Source: WBCSD, April 2017)



Institutional theory and SDG's

Numerous indicators and methods have been developed but none are globally accepted and used today. None of the literature on social impact has been found during this research, which stipulates the necessity of institutional value. How can social impact measurements be used throughout the world to compare and evolve when they do not obtain institutional value and is seen as an institutional fact? Institutional facts are that I'm Dutch, the euro is a piece of paper and can be used to purchase something and that mass is measured in kg. Social impact methods are based on subjective meaning and human beliefs and are not reality as described in physics or chemistry which have an objective ontology (modified to fit subject from Searle, 2005).

Social impact has a subjective ontology, like economics, as it simply needs to be experienced in order to exist. According to Searle (2005) an institutional fact needs collective intentionality, the assignment of function and a status function. This means that this specific research topic of social metrics relies on a collective intentionality and acceptance of the broader community to give a status function to their use.

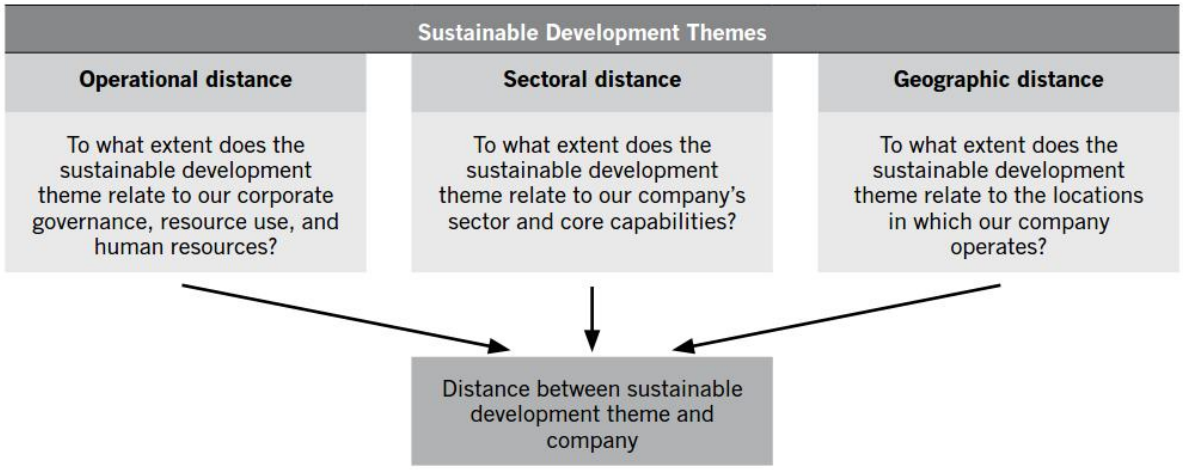
Without the recognition and acceptance of the chosen social metrics from the community formed by governments, companies and civil population they will not have a functional status and will not be useful.

In the Max Havelaar lecture, Van Zanten (2015) argues that the Sustainable Development Goals (SDG's) and their underlying targets should be seen as an institution that can help companies conceive relevant corporate social responsibility (CSR) policies. (The Max Havelaar lecture is organized as a cooperative effort between three institutes[11]. Although the SDG's received some criticism, the inclusive approach during the formulation process by having opinions of over one million people during the formulation process (UNDG, 2013) and the fact that numerous companies and many NGO's participated in creating the SDG's (Palmer, 2015) is overcoming a top-down approach. (Van Zanten, 2015). The fact that 193 countries gratified the SDG's ensures a wide consensus which other sustainability targets have never reached. The SDG's can be used for internal strategy of companies to align their corporate governance or for benchmarking with peers.

The 17 SDG's and 169 targets are elaborate and not all goals and all targets may fit the core business of AkzoNobel or the WTC project. Also global operating companies may have different local circumstances and business units which make one goal more relevant than the other. Van Zanten (2015) has created a framework (Figure 7) to determine the best fit between business and SDG's by sorting on; operational distance, sectoral distance and geographical distance.

[11] The Max Havelaar Foundation (www.maxhavelaar.nl), Rotterdam School of Management, Erasmus University (in particular the department of Business-Society Management; www.rsm.nl/research/departments/business-society-management) and the Partnerships Resource Centre (www.rsm.nl/prc)).

Figure 7: A framework to identify sustainable development priorities for CSR. (Source Van Zanten, 2015)



Operational distance measures the degree to which a sustainable development theme relates to operational aspects of a firm, such as its corporate governance and its human resources management. These sustainable development themes are relevant for the WTC project. Examples include combatting corruption and bribery, accountable and transparent governance, ensuring absence of workplace violence and harassment, providing equal pay and opportunities for men and women, ensuring good working environments for employees and occupational health and safety, offering training and educations programs, energy efficiency, sourcing sustainability, sustainable waste management, and the use of renewable resources (Van Zanten, 2015).

Sectoral distance measures the relationships between a sustainable development theme and the specific industrial sectors in which the firm is active. Certain themes have a stronger or weaker relation to specific industrial sectors, resulting in lower or higher sectoral distance (Van Zanten, 2015). Sustainable food production for example, will have a larger sectoral distance to the WTC project compared to recycling.

Geographic distance measures the relationships between a sustainable development theme and the geographic locations in which the firm operates. Naturally, some themes of sustainable development are more relevant in certain regions and countries than in others (Van Zanten, 2015). For example, in the Netherlands child labor, sanitation or access to primary health are no issue and have a large distance from the WTC project. The institutional cost as described by Coase (1960) will also be reduced as the SDG's would have direct control over a sustainable development theme (low operational distance), the capabilities to contribute to it (low sectoral distance), and a presence in the environment in which the theme is most pressing (low geographic distance). Next to this, being accused of greenwashing, when a policy is taken or used far from core business, is prevented (Van Zanten, 2015).

5.5. Strategic partnerships

SDG 17 is all about partnerships and was developed in 2015. However, creating alliances and partnerships is not new and earlier (business) research can be useful to create more insights in the dynamics of partnering.

Cooperating at economic activities is as old as civilization, when hunters started to work with each other to hunt bigger pray that they could successfully hunt themselves. The Dutch VOC was one of the first multinational organizations which had to be formed out of alliances to be able and withstand competition from larger and more powerful countries. Partnerships are defined as purposive strategic relationships between independent firms who share compatible goals, strive for mutual benefit, and acknowledge a high level of mutual interdependence (Powell, 1990).

Partnerships can afford a firm access to new technologies or markets; the availability to provide a wider range of products/services; economies of scale in joint research and/or production; access to knowledge beyond the firms boundaries; sharing of risks; and access to complementary skills (Powell, 1987). Norman and Ramirez (1993) even state that the decline of dominance of the traditional value chain towards value constellations is necessary to fit the current knowledge and transformation economy. The term ‘value added partnership’ has been coined by Russel Johnson and Paul Lawrence back in 1988 (Johnson and Paul, 1988). Back then it was foreseen that computer (internet) linked small companies could start to head on the big companies because of the ease of networking but in all cases Johnson and Paul state that they largely depend on the attitudes and practices of the participating managers. Gulati (1998) has studied the social network perspective of strategic alliances and has shown that alliances are often formed from a social network. Firms entering alliances face considerable moral hazard concerns because of the unpredictability of the behavior of partners and the likely cost to a firm from opportunistic behavior by a partner, if it occurs. Social network are a valuable conduit that provide opportunities but also constraints how often and with whom alliances are formed. Firms are influenced in their ability to enter new partnerships by the social network of their past alliances. The status of an organization in the network affects its reputation and visibility in the system. The greater this reputation, the wider the organizations access to a variety of sources of knowledge and the richer the collaborative experience, which makes it an attractive partner. Therefore, a firm’s portfolio of alliances and its network position in an industry can have a profound influence on its overall performance (Ibid).

Partnerships create value by working in alliances and networks. Value in these ecosystems is created by a hard to imitate competitive advantage because knowledge on how to sustainably control these partnerships cannot be copied or substituted by competing companies (adopted from Barney, 1991). Dyer et al. (2001) have found after an in- depth study of 200 corporation and their 1572 alliances that after each announcement the stock market price raised with roughly 1% which translated into an increase in market value of $54 million per alliance. They also state that certain companies performed significantly better than others by building a dedicated strategic alliance

function. The dedicated alliance function creates value by improving management efforts, increase external visibility, improves internal coordination and facilitates intervention and accountability. The latter one is interesting as an earlier survey from 1999 (Accenture) found that only 51% of the companies who formed alliances had any kind of formal metric to asses alliance performance. 20% of these companies believed that the metrics were of any use. Dyer et al. (ibid) show similar results were 70% of dedicated alliance function used metrics against 30% without the dedicated function. Metrics are needed to asses control alliances and intervene when things go wrong.

Rademakers (1998) wrote an article about 'the power of competition by partnering and intermediate organizations as binding force between companies. Rademakers (1998) describes the partnerships within the successful Dutch potato industry and the complexity because of the number of partners. Communication will get increasing coordination problems because of the addition of more partners (formula: $n*(n-1)/2 = r$, of which n is number of companies and r the number of relations). He suggests an intermediate organization which has the following advantages: Lower uncertainties by the development and execution of formal agreements and by representing common interests with governments and arbitrate between differences between partnering companies. Lower risks by initiating common activities, initiate and coordinate actions in case of crisis. Cohesion in industry by creating a positive group dynamic and fine-tune visions.

The popularity of partnerships has risen even further to and has got a good grip in the area of sustainability. Cross-sector partnerships are one of the most exciting and dynamic areas of research and practice within business and society relations. Partnerships that bridge different sectors (public, private and nonprofit) are thriving around the world (Tulder et al. 2016). The central aim of many cross-sector partnerships is to solve economic, social and environmental problems through collaboration (Crane, 1998). Partnerships generally address the social responsibilities of participating organizations, either in response to external pressures, in anticipation of potential social issues that may arise in the future or as part of the process of interaction by adapting to emerging issues (Seitanidi 2008; Van Tulder et al. 2014 from Van Tulder et al., 2016).

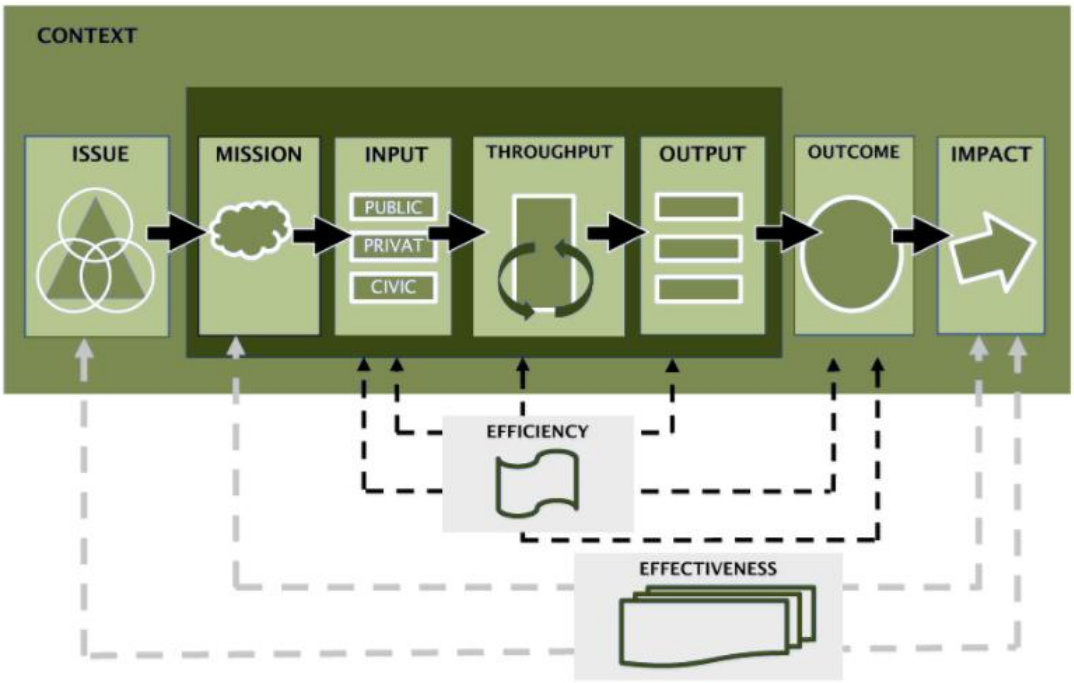
But what makes partnerships successful? Drost and Pfisterer, (2013) have done research on 294 actors involved in cross-sector partnerships, from state, market and civic sectors, in a diversity of job positions, including project manager, director and technical advisor and from different regions, originating from 32 countries. Five critical success factors were found to be most important according to the involved actors. (1) Clarity of roles, responsibilities and ground rules, (2) Clear understanding of mutual benefits, (3) Clear vision of objectives, (4) Clear communication, shared planning and decision making, (5) Good leadership. Mohr and Spekman (1994) suggest that trust, the willingness to coordinate activities, and the ability to convey a sense of commitment to the relationship are important. Critical to partnership success is the communication strategy used by the partners and the management approach towards working with other firms so that mutual goals can be achieved. The partner's ability to take the other perspective and attempt to resolve differences improves the relationship and the problem solving skills.

5.6. Strategic partnerships and social impact measurement

Quite some research has been done on partnerships and on social impact but the combination is rarely investigated. Many of the impact measures developed in one sector are not suitable for the more complex organizational forms of cross-sector partnerships. Here multiple actors from different sectors interact and co-create impact (Van Tulder et al., 2016). Partnerships represent a wide variety of organizational forms, interests and expectations which makes it much more difficult to define success than evaluating a single organization (Provan and Wilward, 2001 from Van Tulder, 2016). The Partnering Monitoring and Evaluation framework in Figure 8 (Van Tulder and Maas, 2012) is made to facilitate the impact value chain of the partnership and to assess the actual contribution or impact of the partnership and contains two dimensions:

- A descriptive part that follows the partnership from its start-up phase towards its output and outcome phase and;
- An analytical part that covers the four most relevant aspects of partnering: context, efficiency, effectiveness and impact.

Figure 8: PEM (Source Van Tulder and Maas 2012)



In short the PEM offers a stage gate approach of partnership management and starts with (1) a problem/opportunity statement after which the partnership addresses a short or (2) long term mission, (3) determines the resources, organizations and capabilities needed, (4) determines the necessary actions, (5) analyses the outputs or deliverables of the actions, (6) measures the actual

benefits for individuals or organizations influenced by the partnership, (7) and analyses intended and unintended, direct or indirect, the long or short term impact of the partnership. The efficiency dimension analyses the internal value-added of the partnership and which specific costs can be attributed to it (input à output) and tactical performance which indicates the efficiency of the input compared with the actual outcome. The effectiveness dimension will show the value-added of the partnership compared to individual activities of the other partners. This will all be relative to the context the partnership is operating in.

Using this model, individual performance, organizational performance, partnership performance and society effects can be analyzed and corrected during the partnership project using four impact loops (Van Tulder et al. 2016).

1. The first impact loop measures the added value of the input (money, staff, time) and throughput. The individuals and the partnership organization next to the structure are the units of analysis. How is the partnership operating and are the people in the partnership having a good time doing it (internal analysis of the partnership). Good teamwork and atmosphere are important circumstances to get good results. Is everybody happy?
2. The second impact loop examines the effects of the value added in the partnership (project performance). Basically it takes the first loop and adds the actual output in the analysis (outputs are the tangible deliverables and not the outcome). In typical project management the Ghantt chart and the S-curve are used to create an understanding of projects progress and efficiency. The project of the creation of the WTC plant is the unit of analysis in this loop.
3. The third impact loop measures the output of the added value of the partnership and relates this to the mission of the partnership to see if the actions and resources have the desired effect. For the WTC project this is the processed waste and the created Methanol as an example. Is the investment proving to be worth the effort?
4. The fourth impact loop finally includes all stages and measures if the inputs needed to make the mission statement work actually have effect on solving the issue. Taxes, profit and saved CO_2 are examples to be measured for the WTC project.

Counterfactual analysis from peers or other partnerships is necessary to establish an understanding of what would have happened anyway without the intervention of the partnership (Van Tulder et al. 2016).

6. WTC partnership

To understand where value can be added in the WTC partnership, a detailed understanding of the project and partnership is necessary. In chapter 6.1 the WTC project is explained in general after which an in depth description of the WTC strategic goals are presented in chapter 6.2.

6.1. The WTC project

In this chapter the WTC initiative is explained after which the consortium partners are presented and the main findings of the interviews are shared. An investigation paper made by the consortium partners, a white paper and the BID book are used as a source of information next to several interviews with primary stakeholders within the WTC project.

The WTC concept in Rotterdam
The waste to chemicals consortium aims to establish the first European large-scale demonstration of an innovative chemical recycling plant. The plant produces methanol at a commercial scale from mixed municipal solid waste, but also from residual biomass and other non-homogenous, carbon-rich waste feedstocks. Compared to fossil based methanol the mixed waste feedstock for methanol results in a net CO_2 emission reduction[12]. Methanol is used in acidic acid (for fibers and adhesives), dimethyl ether (clean propellant gases), thickening agents, biofuels and other chemical derivatives. In addition, this project is a catalyst for comparable future replication initiatives across Europe, the transition towards a circular economy and a unique opportunity for creating a bio-based syngas network, providing this syngas as a multi-functional building block for downstream chemical and energy industries.

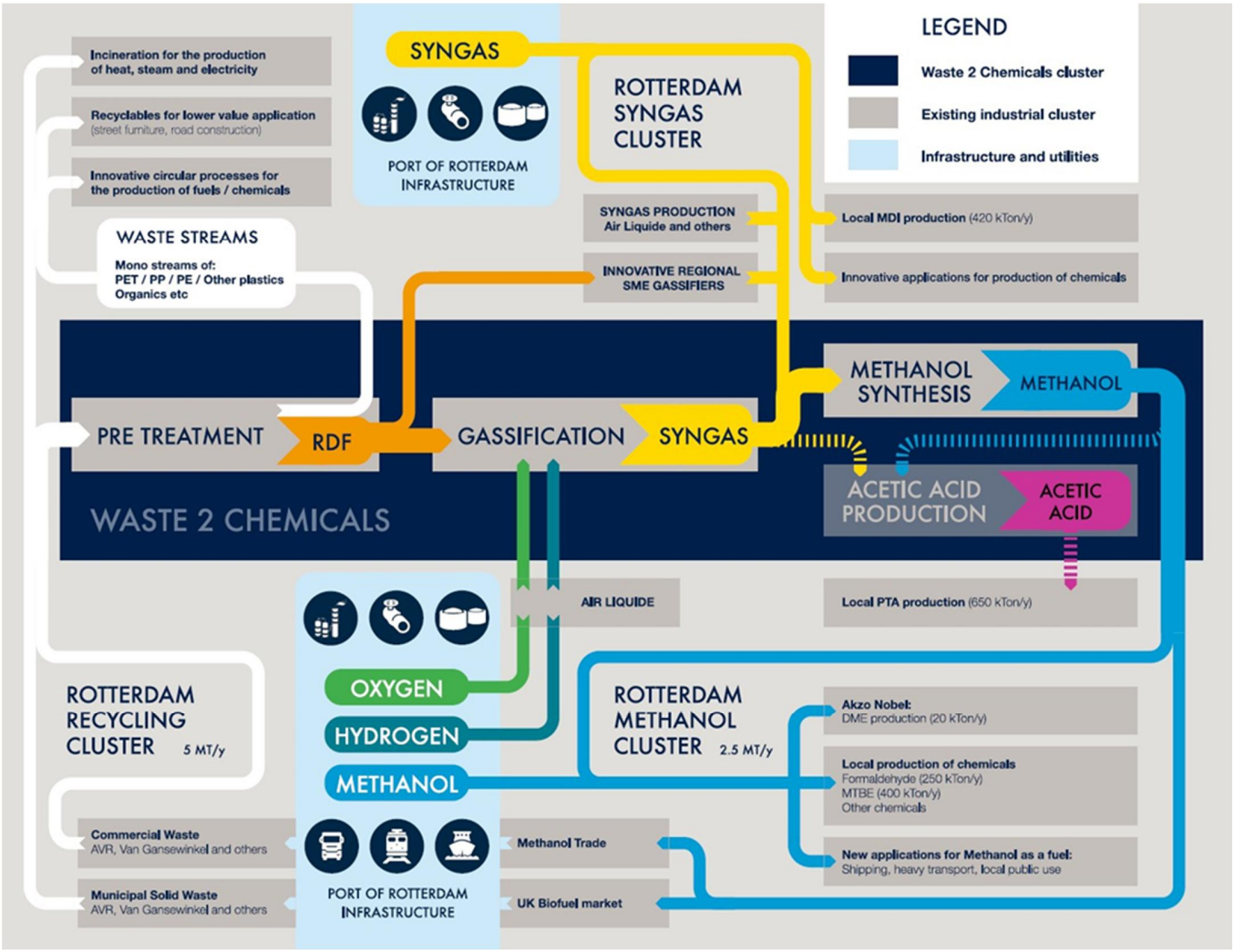
Key figures (Source: white paper WTC V2.2):
- ± € 180 million capital investment;
- Start-up in 2019/2020;
- 360 kton[13] waste per year processed;
- 135 kton CO_2 per year reduced;
- 220 kton methanol per year produced;
- Large CO_2 savings;
- 50 direct + 150 indirect jobs.

The concept of the WTC project should contribute in various ways with the goal to create a port-industrial complex of Rotterdam which is future-proof. The technology enables valorization of (household) waste through chemical recycling into chemical molecule blocks. The large-scale implementation of the Enerkem's technology should strengthen the respective chemical clusters

[12] CO2 (carbon dioxide) acts as a greenhouse gas which has been proven to create climate change which slowly heats-up the earth and has several negative side effects such as rising of sea level, dramatic weather effects and social impact because of this (IPPC).
[13] kton = 1000.000 kilogram.

and its infrastructures, providing potential for new synergies in the port-industrial complex of Rotterdam. The development of the first WTC plant in Rotterdam should generate valuable local knowledge and experience that can be leveraged to develop spin-off firms. These spin-offs could build upon the syngas-route created by the WTC project but they can also be spin-offs that focus on different methods of waste pre-treatment or waste recycling. The WTC project could support the creation of new R&D infrastructure by enabling and funding bio-technological knowhow in the region.

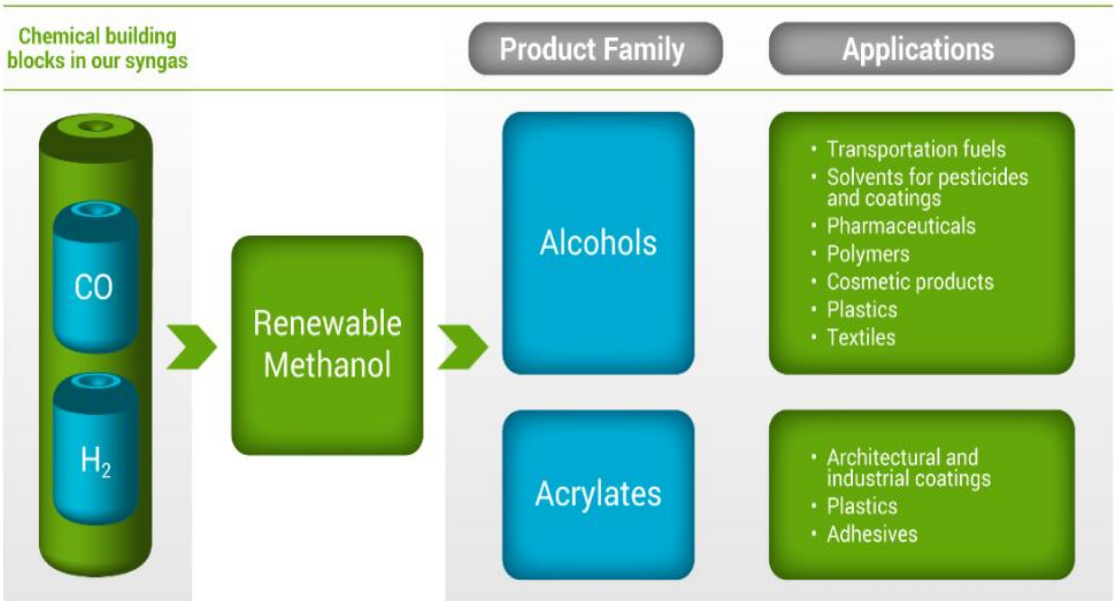
Figure 9: A visualization of the intended chemical cluster using existing infrastructure and expanding with WTC project (Source: Rotterdam cluster development around WTC Enerkem 2020-2050 received from project team, May, 2017)



This should come from new partnerships in existing and new production chains. The WTC plant in Rotterdam will have the capacity to convert 360 kiloton of residual waste per year. In Europe around 2600 million tons per year of waste is created through economic activities and households and in the Province of South Holland around 5 million tons[14]. Figure 9 shows a detailed outline of the WTC (sometimes called W2C) concept and potential for the industrial area of Rotterdam.
Plans exist to create a pre-treatment unit to separate the waste in a better way and create a more efficient recycling process. The RDF waste is normally incinerated or landfilled but with the Enerkem technology it can be chemically recycled which is seen as more sustainable.

Methanol is used as biofuel, as building block for acetic acid and formaldehyde which in turn are used to create everyday materials and are used as building materials in households and cars. The European Union is currently in shortage of methanol production capacity (around 2500 kiloton/annual). Being a commodity market, it is shipped into Europe in large quantities (4500 kiloton/annual). Currently, methanol is made out of fossil fuels and is one of the challenges for this new technology. The price of methanol is directly linked to the oil price. A higher oil price is therefore better for the WTC project as it will increase the methanol price and increase revenues. Below in Figure 10 a visualization of the possibilities of Methanol and the end products (source: R&D information obtained by partnership[15]).

Figure 10: WTC product overview (Source: Received from WTC project team, May 2017)



[14] www.ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics#Waste_treatment.
[15] **Rotterdam cluster development around W2C Enerkem**: *An investigation into some strategically important clusters for W2C and their potential (2020-2050) to enable W2C developing into a lasting, successful niche in the chemical market in Rotterdam.*

Location

The WTC plant will be situated in the Botlek area in the Port of Rotterdam (The Netherlands) near the municipal waste facility of AVR where it has direct access to the feedstock of household waste. As can be seen in Figure 11, the WTC plant will be in close proximity to the village of Rozenburg (district of The City of Rotterdam) and village of Maassluis (not part of The City of Rotterdam). The Botlek area is designated for industrial activities and has all the infrastructure and resources needed to operate the plant.

Figure 11: Photo of location and proximity of villages Rozenburg and Maassluis (Source: Google).

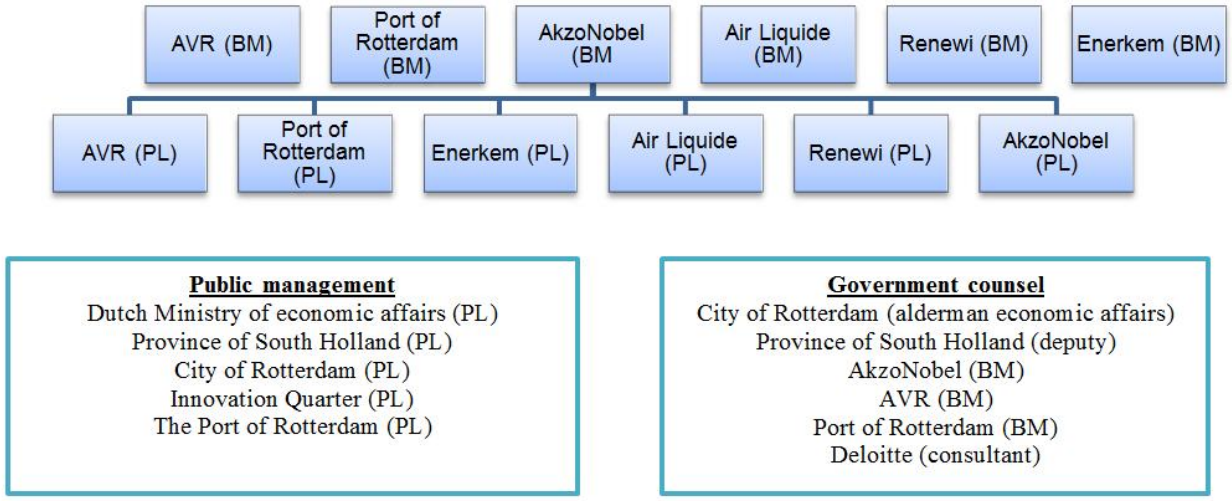
Project team

The WTC project has been started by Enerkem and AkzoNobel and followed the initiation phase where the partners were selected and gathered. After these first steps, they started to learn each other's intentions and also determined the area of operation. The partners first created a bid procedure where interested areas in The Netherlands could present themselves. The Province and City of Groningen and the Province of South Holland and The City of Rotterdam were interested. The City of Rotterdam won the bid because of the favorable infrastructure and location close to universities and highly educated labor forces.

The partnership has been formed and negotiations are being held to divide investment, tasks and profits from the new plant. The following parties are currently involved in the partnership: AkzoNobel, Enerkem, Air Liquide, AVR, Renewi, The Province of South Holland, The City of Rotterdam, The Port of Rotterdam, Rotterdam partners, Innovation Quarter and Clean Tech Delta.

The project is structured with a project management team lead by project leaders (PL) who steer different disciplines in finance, engineering, purchasing and funding and a steering committee led by business managers (BM) and two separate frequent meetings for interaction and government affairs (see Figure 12). The total WTC team composes of around 50 people who frequently work on the project. The different partners have divided the work to, amongst others; further develop the business case and determine project requirements, investments costs and legal requirements.

Figure 12: Organization of WTC project (Source: Received from project team, May 2017)



Project phase

At the time of this thesis, the WTC project has had a BID procedure where two locations in The Netherlands were asked to describe their region and optimum fit for the WTC project. Rotterdam was chosen in favor of Delfzijl (Groningen). Currently the project is in the initiation phase and the 5 commercial partners (AkzoNobel, Renewi, Air Liquide, Enerkem and AVR) have signed a Project Development Agreement (PDA) for the Initial Development Phase. In this phase they have divided the work according to their core business and specific resources to amongst others:

- Validate the technical and commercial viability of developing, operating and maintaining the Plant;
- Validate the technical and commercial viability of developing ancillary plants that support the development, operation and maintenance of the Project, including Waste pre-treatment and industrial gas supply facilities;
- Create a basic design for the project which means a block-flow diagram, mass balance and energy balance for a specific site, which leads to an accuracy in economics of +/- 30%.
- Initiate the environmental impact study procedure;
- Enter into discussions with the relevant site parties and secure a site option;

- Perform market studies as deemed necessary;
- Apply for and secure grants and subsidies from local, national or EU authorities;
- Determine the required financial budget for the Development Phase and the Pre-Execution Phase.

The partners basically perform the tasks in the project which are closest to their core business. The work within the partnership is divided by using the most appropriate companies to perform the necessary tasks. The tasks have been plotted in a Gantt chart to control the time spend and foresee in achieving the intended timeline.

The Port of Rotterdam has an interesting role as they act as an intermediate between private companies and government (Figure 12). Furthermore they act as a mediator in the negotiations between the private partners. AkzoNobel major role is in communications and government funding and they ensure the output for the end products. AVR primarily participates in the design development of the plant with respect to utility connections and any infrastructure relating to waste delivery and pre-treatment next to provide terms to operate and maintain the process sections of the plant. Together with Renewi they procure terms for the most cost effective thermal treatment and disposal of all solid plant residues. Enerkem is primarily working on designing the new plant. Renewi is primarily occupied by the waste separation philosophy and waste collection methods. Air Liquide is guiding the connections with the syngas network and outputs for the intermediate product and possible addition of other gasses to enable a higher process yield. Furthermore, they participate in the design development of the Plant and providing a proposal regarding the sharing of synergies that are identified and may be realized. Rotterdam and the Province of South Holland and adjacent parties like Innovation Quarter have a smaller but equally important task to realize funding and correct spending of taxes but also acting as a chain director foreseeing in contacts which can aid in the development.

Funding of this initiation phase has been done equally by each partner and large investments are not yet made. Project management guidelines followed by the partnership ensure an elaborate understanding of the risks and necessary actions and budget before actual spending of capital. So called front end loading gradually increases knowledge at low investment, is reviewed by project managers from other projects and is presented to the steerco before continuation of the project. This project management method adds paperwork and work but mitigates financial risks for the WTC project and partners. After the initiation phase a new entity will be created and the stakes will rise for each partner but details are not known at the time of writing.

6.2. Strategic goals of the WTC partnership

The goal of many cross-sector partnerships is to solve economic, social and environmental problems through collaboration (Crane, 1998). The WTC project is a very good example as it creates an innovative and better way to deal with waste and has the potential to add shared value across the three sustainable pillars. A well-documented effort on establishing the various strategic goals from governments and private parties has been made by the project team. It can be seen that the project focusses on several of these problems. The WTC project is in the initiation phase and not all goals are fully pursued at this moment. Realizing the creation of the new plant is the first and most important step within the project team. After this, the realization of other activities are foreseen to operate the plant and create extra added value. This will in the long run create the envisioned concept of a waste and chemical cluster. In Table 1 the strategic goals divided by the three pillars of sustainability including the strategic perspective and rough timeline are shown.

Table 1: WTC simplified strategic goals, divided in three pillars of sustainability and timeline

Goals WTC	Economic	Environmental	Social
Short term	Get sufficient funding from governments and private parties to design, construct and operate WTC plant	Establishing environmental impact and necessary mitigating actions to comply to environmental regulations	Aligning the WTC partnership towards the next phase
Midterm	Create a profit through operation of the plant and raise tax revenue	Create an positive environmental impact trough recycling (circular product) and by reducing CO_2 in the atmosphere	Create sustainable jobs and increase of knowledge and knowhow in region
Long term	Increase profits through waste, chemical and knowledge cluster of WTC related technologies	Act as a catalyst to create circular cluster and move from fossil based economy to a non-fossil based economy and so relieve pressure on the environment	Take part in creating a sustainable society for Europe

The WTC partnership describes the impact of the WTC project using three areas; environmental impact, economic impact and catalyzing the circular economy. Social impact is not mentioned specifically but in intertwined within these areas. For the ease of reading, the areas will be divided into the three pillars of sustainability according to Elkington's triple bottom line (1998, 2004).

Environmental goals: the current initiation phase, the goals are to get more details on the technology with respect to local environmental regulations. The regulations are stricter than the regulations in Canada (especially on particle matter, PM_{10}). In the future, the new plant will enable the recycling of mixed waste streams which would normally be incinerated. The chemical recycling captures the normally emitted CO_2 and creates it into methanol. It also prevents the import from methanol which reduces created CO_2 because of necessary transportation. When properly fostered, this technology will on the long term act as a catalyst and create spin-offs and technologies to further develop a positive environmental impact from waste.

Economic goals: Next to a direct effect of direct and indirect employment and tax revenues, a cluster development program should ensure a spin-off on a new waste, chemical and knowledge cluster. When this is achieved, the Rotterdam harbor will be strengthened with sustainable employment for people in the region. This creates a long lasting competitive advantage for this important part of the Dutch economy. The circular economy will help in this respect by lowering import dependency of the base chemical methanol.

Social goals: The WTC project has not specified the social aspects in great detail rather than increasing direct and indirect jobs during construction and operation of the new plant. Currently the social focus is on the alignment of the partnership towards the common goal of creating an acceptable business case. Eventually a knowledge cluster with R&D facility is envisioned where researchers and scientist create additional sustainable innovations directly related to waste or chemicals with universities and regional institutes. The majority of social impact is taken in the economic and environmental goals by ensuring sufficient jobs and so creating a sustainable economy. As the development manager from City of Rotterdam said:

'*Our biggest social value is to create a sound and sustainable new economy which can profit the next generations'.*

The WTC project is seen by the partners as a first and potentially significant major stepping stone in accomplishment of the transition agenda fueled by the government of The Netherlands and executed by (i.e. Port of Rotterdam, municipality of Rotterdam and province of Zuid-Holland).

7. Individual strategy partners

The WTC project has clear strategic goals and a value proposition but the individual partners also have strategies and goals. This chapter describes the degree of alignment between the partners from a higher strategic perspective. Next to the reason why a partner joined the WTC partnership, also the individual partners' social metrics are described to see which social metrics are close to the core business or strategic agenda. This will be used to select shared social metrics for the WTC project which have the commitment of the individual partners. The summary of this chapter can be seen in Table 2.The proximity to their existing operation will reduce transaction cost, and from an ethical perspective, increase the normative imperative to contribute to the theme (Van Zanten, 2015). The interviews also served to see if there were any barriers within the partnership. Chapter 7.1 will elaborate on the identified barriers.

During the interviews it became quite clear that the concept of social impact measurement is still in its infancy for all partners. The selected social metrics therefore show the current state and do not contain preferred or preferences of social impact measurements from the interviewees.

Table 2: Summary of WTC individual strategic goals and aligned social metrics

Partner	Strategic goals	Why in WTC?	Selected social metrics from current business
AkzoNobel	CO_2 reduction, organic growth, create a competitive business model which is fit for the future by adding value in economics, sustainability and society	Bio methanol, CO_2 reduction, eco-premium solutions. Fits strategic vision.	Social metrics as in the 3D P&L (human capital development, jobs, salaries & bonuses, post retirement costs, other social charges, third Party labors, injuries)
Enerkem	Grow and spread WTC technology across the world through partnerships	WTC technology provider, core business. Fits strategic vision.	Jobs, tax, increased recycling, underprivileged jobs, education
Port of Rotterdam	Transform harbor, diversify, join forces to innovate, CO_2 reduction	Aid transformation economy and create new diverse harbor. Fits strategic vision.	Knowledge transfer on recycling and sustainability
Municipality of Rotterdam	CO_2 reduction, jobs, tax, transform harbor and industry to sustainable economy	Jobs, transition, CO_2 reduction. Fits strategic vision.	District monitor ('Wijk monitor') social metrics & education for children and higher education workforce (%)
Province of South Holland	CO_2 reduction, clean and future resistant energy. A growing, sustainable and innovative economy	Aid sustainable development, circular economy, innovation cluster and bringing highly educated people to province. Fits strategic vision.	Percentage in annual growth of the income of the priority clusters. Noise and NO_2
Renewi	Making valuable products from waste, margin expansion	Use less CO2, waste to new products, core business. Fits strategic vision.	Knowledge transfer on recycling and sustainability

AkzoNobel in WTC

The specialty chemicals business[16] (see attachment B for more details) of AkzoNobel is involved in the WTC project as they already make use of the intended end product, Methanol. Because of the targets set by AkzoNobel, the R&D team has been investigating several possibilities to create a more sustainable business. Focusing on methanol as this has a big footprint in the raw material cycle, AkzoNobel went out to investigate possible technologies and came into contact with Enerkem.

Corporate director sustainability: This whole partnership is established for AkzoNobel because, in the end of the day, we want to source bio-methanol instead of fossil fuel methanol. AkzoNobel Project leader for the WTC: Methanol was identified as one of the raw materials used by AkzoNobel which has the potential to be won from alternative sources. Our goals are to create eco premium solutions and to lower our carbon footprint. We are continuously researching how to 'green' our business. This project is a very nice way to achieve this with more or less the same costs, should we use conventional Methanol.

From a macroeconomic level AkzoNobel has discussions with European organizations such as CEFIC[17] about the transitions in the world. Europe does not have an abundance of primary resources and needs to keep materials in a closed loop and use molecules twice instead of once. The WTC project in Rotterdam could be a springboard for the rest of Europe and add new jobs and innovation. The WTC project is just one of 12 identified technologies in green chemistry, circular economy and renewable energy which could add to the circular transition of the European society.

Corporate director sustainability: New thinking, social cohesion and confidence in Europe, understanding that Europe does not need to be depressed; we can grow and acquire new industries. Yes we will lose many jobs in finance, in banking, in insurance, because robotization and what not but if we transform to a new economy we will have so many jobs opportunities in Europe, the chance to educate people and to work together.

AkzoNobel's strategic goals

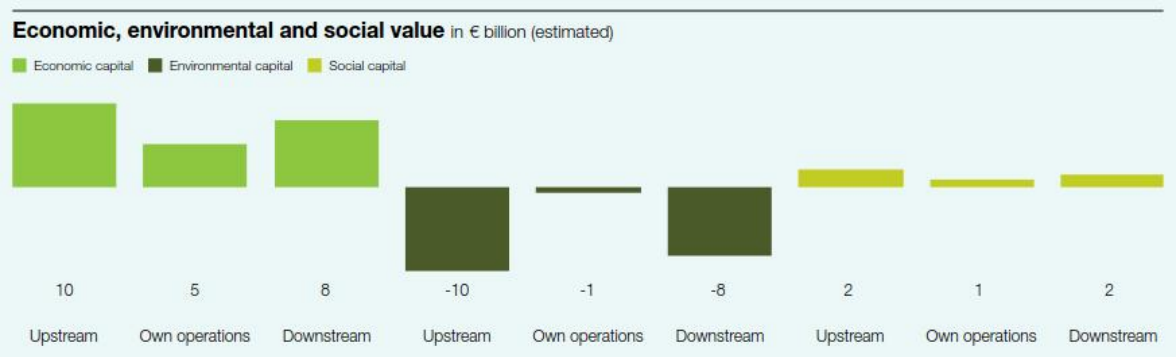
This thesis is made on behalf of AkzoNobel and the introduction explains the majority of the strategy. The strategy of AkzoNobel is to align their core business with sustainability, and this way, outperform competitors which have a more conventional business model.

[16] Six data sources are used to profile AkzoNobel, a recently made factsheet for the specialty chemicals business (www.akzonobel.com/about-us/how-we-are-organized/specialty-chemicals, April 2017), the AkzoNobel annual report from 2016, the AkzoNobel website (www.akzonobel.com, May 2017), an interview with the Project Leader from AkzoNobel for the WTC project, an interview with the Social Impact Manager, the Director Planet Possible and with the Corporate Director Sustainability.
[17] The European Chemical Industry Council

AkzoNobel and social metrics

In the annual report of AkzoNobel[18] a chapter is dedicated to sustainability. The sustainability statements show data and explain which projects have been undertaken and which progress is made. AkzoNobel also started a 3D profit and loss measurement where the impact is monetized on the economy (employees, suppliers, customers, communities in which it operates, governments and investors) the environment (environment and natural resources) and society (value chain). Hereunder in Figure 13 the results are shown.

Figure 13: 3D P&L outcome (Source: AkzoNobel, Annual report 2016, Sustainability Statements)



Numerous metrics in the annual report (Figure 14) show how value is created through economics, environmental and in lesser extent, social value. The main financials were also stated in the factsheet where social figures are mainly reported on inputs level. On an impact level, social parameters like Health & safety incidents, Skills and Capabilities are reported[19].

Figure 14: Social indicators (Source: Annual report AkzoNobel Sustainability Statements (2016).

Key performance indicators – social

	2013	2014	2015	2016	Ambition 2020
Employee engagement score (0-5 scale)	3.88	3.97	4.03	4.17	>4.20
High potential turnover (%)	–	–	6	4	<5
Female executives (%)	16	17	19	19	25
Executive vacancies filled internally (%)	75	68	58	61	70
Total reportable injury rate employees/supervised contractors (per million hours)	2.3	1.8	1.6	1.4	<1.0
Loss of primary containment (Level 1)	–	–	–	16	–
Priority substances with management plan (%)	62	82	100	33[1]	100[1]
Cumulative Community Program involvement (number of projects)	2,108	2,260	2,385	2,531	–

[1] Phase 2 started in 2016

[18] www.report.akzonobel.com/2016/ar/, May 2017
[19] http://report.akzonobel.com/2016/ar/sustainability/creating-shared-value-across-three-dimensions.html, May 2017
https://www.akzonobel.com/about-us/what-we-do/sustainability/our-approach/our-report/further-performance-data, May 2017

Enerkem in WTC

As Enerkem[20] is technology supplier and has one operational factory in Canada. This is the business model of Enerkem. The WTC project in Rotterdam would establish a first foothold in Europe. The regulations are stricter in Europe as well as the bureaucracy according to the interviewee but for Enerkem this is an very important step in expanding their business.

Enerkem's strategic goals

Enerkem actively search for partnerships to establish new facilities over the world. Partnerships are currently being made in China, the USA and Europe (with AkzoNobel).

Enerkem and social metrics

Enerkem states that each facility (through an independent study by Doyletech Corporation on their facility in Edmonton, Canada) creates 610 direct and indirect jobs and generates a net economic impact across Canada of $200 million dollars during construction. During operation, each facility creates 150 direct and indirect permanent jobs and increases the local annual net economic spending by $65 million dollars. Enerkem is, other than safety and other typical metrics not measuring social impact but has used ways in reaching the public through various ways of communication. Open house to invite local resident but also local governments and businesses were contacted to establish an idea about possible future interference of other stakeholders.

Director Government affairs: As a small company this done before we invest a large part of our resources and also this is regulated by the government, we have to consult and inform the public.

The municipality also provides the social aspects by starting an interesting project to involve the less fortunate in the area. The facility in Edmonton collects waste which needs to be sorted before entering the process of conversion. The municipality operates the waste collection and has brought in a project to help underprivileged and physically challenged people with a job.

Director Government affairs: Even though you could say that the job isn't very nice because they are handling waste, they get transport from their home, a decent wage and good secondary conditions. This way the underprivileged have a chance in participating in society.

Furthermore, the municipality gives guided tours across the factory to grade 3 and grade 6 children to show them how to recycle and where our garbage goes. For this, they have built a safe and clean walk path which is shielded with safety windows from the facility so the children can walk around and see everything without danger.

Director Government affairs: We do not have anything to do with it as the waste is provided by the municipality and they take care of everything. They hope to educate the children so they will start

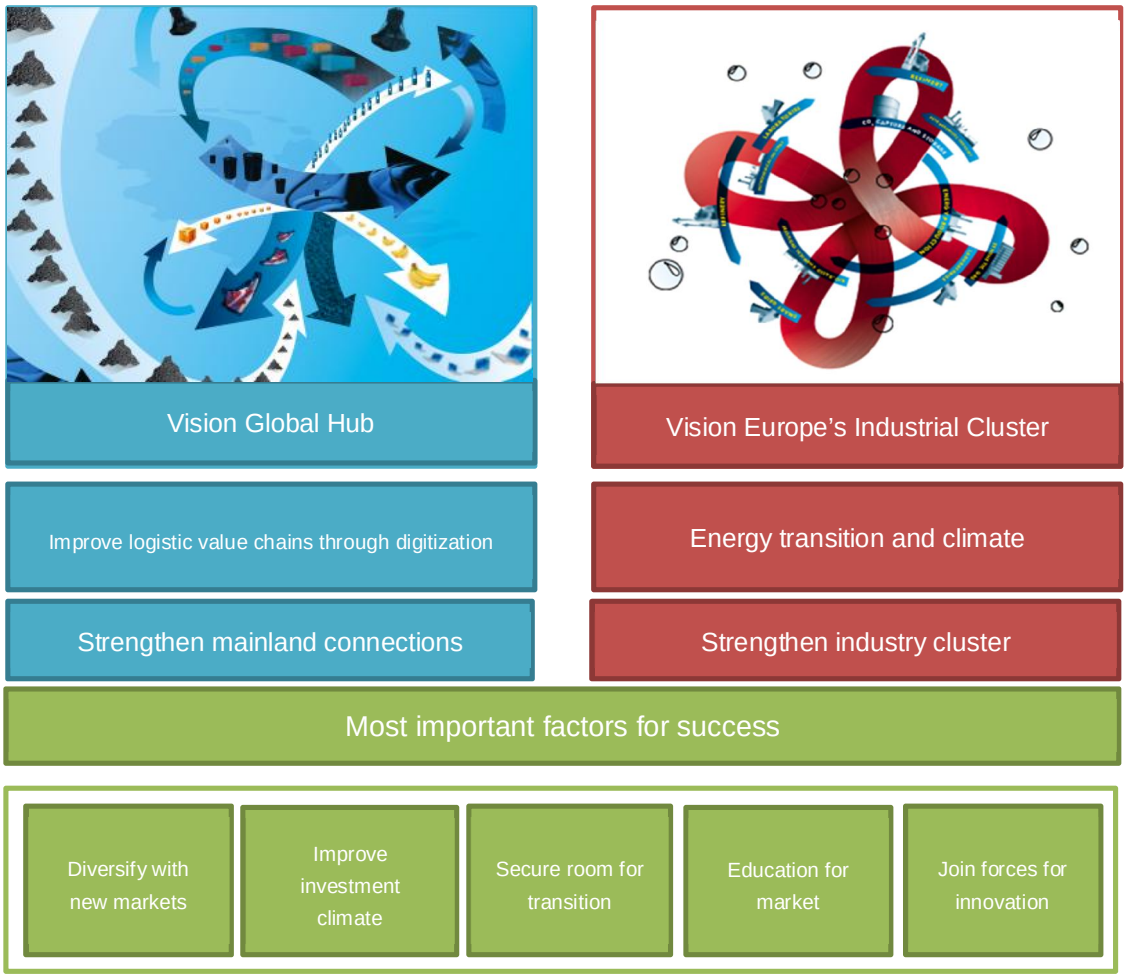
[20] Two data sources are used to profile Enerkem. Enerkem is not listed on the stock exchange and information cannot be readily obtained from an annual report so use is made of their website and an interview with the director government affairs of Enerkem.

recycling and also confront their parents about recycling so they will start too. We could not afford to do this because we need all the staff and resources for our technology to grow our company and keep it healthy.

Port of Rotterdam in WTC

The Port of Rotterdam[21] is in the WTC project to show that they are not just standing on the sideline looking at the shift of commodities and changes which are happening in the world.

Figure 15: Harbor vision towards 2030[22]



[21] Three data sources are used to profile the Port of Rotterdam, a strategic progress report from 2016, the Port of Rotterdam website (www.portofrotterdam.nl, May 2017) and an interview with a business manager of the Port of Rotterdam.

[22] (translated from Dutch, source: https://www.portofrotterdam.com/nl/de-haven/havenvisie-2030, consulted in May 2017)

Business manager: We looked at the leverages we could use to strengthen the harbor and stimulate new initiatives. We could lower the prices of our harbor fees of lower the lease of land but that won't have a large impact on the business case. From the chemical cluster we've identified several 'molecules' such as Syngas, Glucose and fructose and started to look for products which aligned with the intention to join forces and make a difference. If we get into a project, we can raise the bankability and justify this to the government as it contributes to form a new industrial cluster. The classic business model is not providing us with the same profits as before. The existing cluster has been made around 1960 and beginning of 1990 and no big new projects are foreseen. Societal challenges such as climate, digitalization, scale gas and the low raw material prices in the rest of the world are challenging our port. How can the Port of Rotterdam keep this cluster vital and so keep their license to operate?

The Port of Rotterdam's strategic goals

The strategic progress report from 2016 shows the main priorities of the harbor towards 2030. As can be seen in Figure 15, it has two largest focus areas, improve logistics and ensure an energy and climate transition. Two other interesting aspects with regard to WTC can be seen in the success factors: Education to market and join forces for innovation. The port is actively searching for technologies, markets and social developments to reduce the output of CO_2 and satisfy the Paris accord (2015). Competition from Asia and the Middle East is challenging the chemical cluster in Rotterdam and so the industrial cluster has set the goal to strengthen the current cluster and rapidly evolve the bio-based and circular economy.

Port of Rotterdam and social metrics

Social impact is not being measured at this moment other than safety.

Business manager: We have just begun measuring our environmental impact by measuring our CO_2 footprint, but I can't say that we are controlling the outcomes yet. When a project does not meet CO_2 footprint goals we will not, because of this, cancel the project.

Even though the Port also has a public task, no metrics are being measured to see if there contribution is also paying the desired effect. On the site it can be seen that the port is active in reducing odor complaints together with port environmental authority DCMR (The DCMR is the environmental protection agency of local and regional authorities in the region around Rotterdam called Rijnmond region).

City of Rotterdam in WTC

The environment is changing. From a micro economic level, Rotterdam[23] had the biggest port and created a big pull for companies but now Rotterdam is the 3rd biggest in the world and investments

[23] Four data sources are used to profile the city of Rotterdam, a strategic report of Rotterdam (www.resilientrotterdam.nl/wp-content/uploads/2016/05/strategy-resilient-rotterdam.pdf), a strategic report of the metropole Rotterdam-The Hague (www.mrdh.nl/sites/mrdh.nl/files/files/The-Third-Industrial-Revolution-Final-Report-RNE.pdf) and interviews with the project leader of WTC and with the Development manager clean technology, City of Rotterdam.

are not done here anymore but primarily in Asia. Rotterdam needs to create a transition towards a new economic system. Furthermore, the city sees the need for change and is aiding innovative companies to establish themselves in Rotterdam. The idea is that this will also act as a magnet for others and create a snowball effect which in turn speeds up the transition. The city is changing the way it is operating by facilitating and framing the road for new initiatives as a chain director connecting public and private companies if they meet certain conditions: scalability, demonstrable sustainable aspects, lead to employment and can be enrolled within a short timeframe.

From a bigger perspective, the Government in the Netherlands is quite small compared to other rich countries and they cannot spend too many resources on all kinds of projects. Therefore, if the city wants to transform and innovate the economy, they need partners from private companies. Companies like AkzoNobel, Enerkem and Renewi who can deal with the technology, the city aids in extra funding and getting a good network. For the municipality this project is very interesting because companies who normally work alone are now combining forces. And the interesting part is that all these interests and ideas somehow need to come together to make it work. For none of the partners this technology is core business. The partners are all out of their comfort zone and this needs guidance. How can you steer the project in such a way that you get the most out of the resources. The normal tools you use in a project to steer the outcomes are not useful because of the complex nature of partnerships.

Development manager clean technology, City of Rotterdam: The new network economy which is needed needs new people, new way of working and management (in partnerships) all because of the global trends as globalization and digitalization but also you see an interesting shift toward a more local focus.

The WTC project adds on several goals of the municipality by contributing to the circular economy, creating a new method for carbon capture as the waste will be reused in new products and more importantly create one of the first stepping stones for the economic transition of the harbor and industry. Jobs are highly needed as around 10% of the people in Rotterdam are without a job.

Development manager clean technology, City of Rotterdam: We want the people in Rotterdam to work, live safe and have a high state of well-being. Primarily this can be done by providing sufficient jobs and keep people out of poverty. We are losing jobs because of the fact that business is shifting to Asia and America and we need to compensate this with new ones which also have a sustainable lifetime. Our biggest social value is to create a sound and sustainable new economy which can profit the next generations.

Because the business case is not complete yet and The City of Rotterdam is searching for extra funds from Europe and The Netherlands, the focus is on getting the plant operational. The first

priority of the city is to successfully start the complicated new partnership project from which none of the participants has this business as core business. Second priority, after creation of the WTC plant, is to establish an open innovation center where small and large companies can do research on creating more with methanol and syngas and create a new chemical cluster in the harbor. The idea is to work with the universities and schools in the South of Holland on applied science and get most out of the technologies. Biotechnology, or biochemical, biofuel and circular economy have to be developed further and it needs highly educated people to make the transition possible.

Development manager clean technology, City of Rotterdam: This project has a certain order of things and we will eventually, after the plant has been build off course try and establish this but for now the primary focus is to get the project up and running for a longer time and so secure jobs and the start of a new economy.

City of Rotterdam's strategic goals

The City of Rotterdam has laid down seven goals described in their resilient cities to be able to cope with the changes coming from climate, social and technological advances. Hereunder the goals are based on the 100 resilient cities program from the Rockefeller foundation which was established in honor of the Rockefeller's 100th anniversary. (AkzoNobel is also one of the partners).

1. Rotterdam: A balanced society;
2. World port city built on clean and reliable energy;
3. Rotterdam Cyber Port City;
4. Climate resilient Rotterdam to the next level;
5. Infrastructure ready for the 21st century;
6. Rotterdam Networkcity – truly our city;
7. Anchoring resilience in the city.

The goals are further developed into programs and consist of 5 programs which are ongoing, 19 that are being initiated and 44 that are completely new. Because of the sheer volume of these ambitious goals and programs not all will be covered in this thesis and goals 1A, 1D, 2F and 7T have been selected to show potential synergy with the WTC project and social goals. These selected goals are not exhaustive and there good be other synergies after further investigation by the WTC project team.

1A Program for 21st century skills and young leadership

Because society is changing rapidly, this goal and its related actions will teach young people new skills such as flexibility, collaboration, personal leadership and IT skills which are needed so they can play a role in their community. Under 1A, 4 programs will be started to create a new physical hub for innovative learning and collaboration with business, schools, government and private stakeholders.

1D Strong shoulders
The aim is to increase the proportion of highly educated residents in the City in the coming years. Important is to know what drives people to live in Rotterdam or to migrate to Rotterdam. 2 programs are started which will document good practices, remove existing barriers, develop new projects following the needs from the community and provide communication and promotion.

2F Reinforcing Rotterdam Moerdijk industry cluster
Because of the strong integration with oil refining and utility and energy suppliers the cluster should be remained intact as it is of vital importance of the region and of The Netherlands. The cluster is expected to play an important role in the transition from a linear, fossil economy to a circular, bio based economy.

7Q Roadmap to the next economy
The metropolitan region of Rotterdam- The Hague is working on the development of the area which requires investment projects in the region. The developments are needed as economic and technological transitions are changing the major economic clusters in the South of Holland, Green port and Port of Rotterdam. The roadmap focusses on 5 areas which are or should reshape the metropolitan region: Smart digital delta, smart energy delta, circular economy, entrepreneurial region and next society. For the WTC project, the circular economy is most interesting as the WTC process directly adds to this goal. The circular economy only uses renewable resources: energy, organic and technical materials, water, earth and air and therefore will make use of recycling and minimize harmful substances to the environment. The metropole wants to be the first fully circular region in the world and therefore has pinpointed three specific needs which should facilitate this transition from a fossil fuel based economy. Change in attitude by education and infrastructure, the knowledge and the people to take the step by creating new ways of collecting and processing and an analysis of our own use of resources and materials. Secondly the entrepreneurial region is interesting as the region has difficulties in establishing innovative research facilities. The region has a lot of large global companies but none of these companies have created an R&D lab here even though it is surrounded by world class universities as the Erasmus University, the Technical University Delft, University of Agriculture Wageningen and University of Leiden. Also talent and new companies are not fulfilling their potential at this moment and this has to change would the transition be a success. The specific needs according to the metropole are to create an entrepreneurial culture with tolerance for risk and creativity connecting people with initiatives. Create an entrepreneurial structure with intense networks between various sectors and the practice to make it happen by creating financing opportunities and regulations which stimulate enterprise.

The City of Rotterdam and social metrics
The city launched a district profile monitoring instrument in 2014 to support a focused approach per district and is used to compare districts with each other and is updated every two years with objective and subjective scores from government registrations and surveys. It can be seen in chapter 8.3.

The Province of South Holland in WTC

The Province is in the WTC project as it contributes to their strategic goals and tasks. Project leader WTC: *Our economic policy is not all focused on companies. Big projects and frontrunners are sought to create a system change and we want to help them through this. The rest of the companies, if you do not adjust, don't look at the value added for society, we will not support you*.

The WTC project is an important project for the transition for the harbor as it helps to create a transition of chemicals and industry. The plant in Rotterdam will be 4 times bigger than the first Enerkem plant in Canada. This new and innovative technology will come with certain risks and besides this, multiple different companies are participating and for none of them, this process is core business. Furthermore the province believes that there can be a big spin off for the region in three themes: Waste, development in waste roundabout, diversifying of value of waste trough R&D and from output through methanol conversion to other high valuable products which could also have a big CO_2 storage capacity. This links with their ambition on CO_2 reduction from energy.

Project leader WTC: We could also have a technology and knowledge and innovation side just like the center in Edmonton (Canada) which Enerkem has built together with government and neighboring Universities. If we could have this open for public and create an open innovation this would be very valuable for the region as it make it more interesting for companies to come have business here.

The Province of South Holland's strategic goals

The strategic goals of the province are well detailed and transparent. The (multi-annual) budget of the province of Zuid-Holland (according to external regulations) has a four year look-ahead. In addition, the province presents a long-term view of including the (multi- annual) budget for 15 years. The reason for this is that some of the province's major expenses are beyond the scope of the multi-annual budget, but are relevant to the long-term financial position of the province.

Project leader Green Circles: From the highest level, as the government we take care of 3,6 million Dutch people in the most densely populated area in Europe. We need to ensure that they have dry feet, that they can ride a bike, have a job in the neighborhood, have a house and have easy transport to their work.

The strategy is translated in programs where the goals, tasks and budget to achieve the strategic targets are executed. There are five programs for 2017 which are basically the same as of 2014 and these are divided in sub goals which are presented below. Three interesting goals with regard to the WTC project will be described more thoroughly.

1.6 A (more) healthy and safe(r) living environment.

The province wants to achieve that people will be less exposed to polluted air, noise and risks because of hazardous activities or transport of hazardous materials. This is part of the ambition of an attractive climate to work and live in The Province of South Holland and the challenge lies in to

improve the environment as well as strengthen the economy. Towards 2040 it is expected that the population in the 'Randstad' (area around Rotterdam, Utrecht, Den Haag and Amsterdam) will grow and this could create more noise, lesser air quality and more safety risks. Also production is expected to grow near the harbor of Rotterdam which also could lead to increased pressure on the environment.

3.1 A growing, sustainable and innovative economy

To remain attractive and competitive, the province together with partners, are providing resources to exploit the economic power of the area around Rotterdam and The Hague. An investment program has been created to renew and to make the area more sustainable and composes of 150 projects which are applied by municipalities, the province, knowledge institutions and companies. The goal should strengthen the regional economy by growth by using sustainable and innovative technologies. Also the province wants to distinguish itself by creating a flexible and innovative economy with knowledge intensive sectors by exploiting existing knowledge and innovation in the South of Holland. The South of Holland, as most densely populated area, low location to the sea and the presence of energy intensive industry is vulnerable for the growing scarcity of raw materials, rising energy prices and climate change. Therefore, a transition towards a sustainable economy is urgent. However, according to the province, the conditions for the transition are not there because of two weaknesses: Low collaboration between governments, knowledge institutions and companies as well as a low amount of knowledge intensive mid-size companies which succeed to grow further.

3.2 Clean and future resistant energy

The Dutch government wants to reduce the energy demand and speed-up the transition towards clean and smart energy. Over 200 municipalities, knowledge institutions and companies, societal organizations and governments have contributed to an energy agenda which shows ambitions and actions for a sustainable society. The goals should amongst others contribute to the Paris agreements, promote energy savings in industry, facilitate sustainable energy production and exploit chances for innovation and economy.

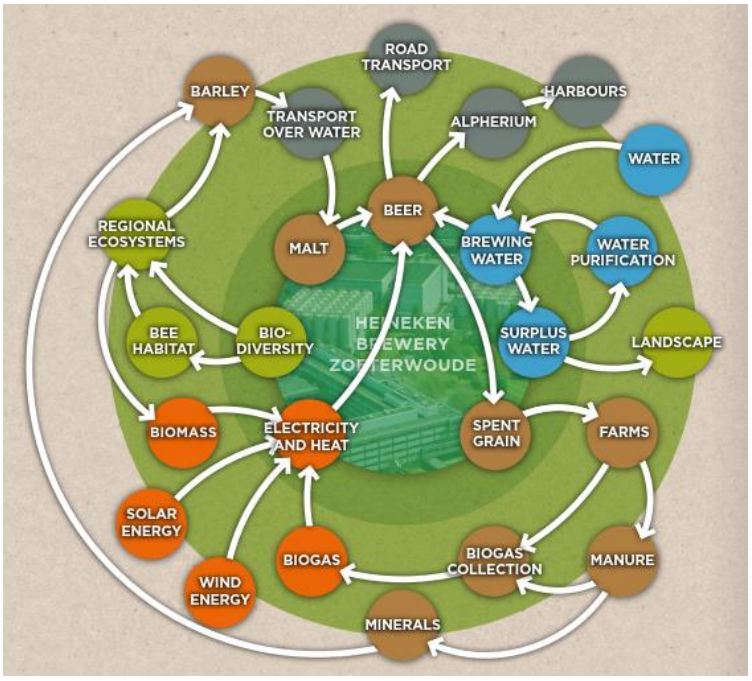
The province of South Holland and social metrics

The three goals are described with regard to the WTC project and the province has also specified outcome indicators for the goals.

1. 1.6 A (more) healthy and safe(r) living environment:
    (a) Number of exposed people to hazardous activities;
    (b) Number of responsible exposed people to hazardous activities as percentage of 1.6a;
    (c) Number of exposed above limit value nitrogen dioxide (NO_2);
    (d) Number of people which have noise nuisance along the provincial roads above 55 dB (decibel).
2. 3.1 A growing, sustainable and innovative economy:
    (a) Percentage in annual growth of the income of the priority clusters.
3. 3.2 Clean and future resistant energy:

(a) Stock sustainable energy in province of South Holland (%);
(b) Supplied sustainable energy in province of South Holland (PJ);
(c) Avoided CO_2 emissions by sustainable energy in province of South Holland (Mton);
(d) Absolute energy savings from 1990 (PJ);
(e) Avoided CO_2 emissions by energy savings and transition from 1990 (Mton).

Figure 16: Schematic representation of projects within the Green circles program (Source, Green Circles, World Class Sustainability, May 2017).



An interesting program which came out of this strategy is Green circles[24] seen in Figure 16. This program has the aim to create a climate neutral Heineken brewery, a sustainable economy, and a pleasant living environment in the Zoeterwoude (Leiden region). It is an initiative of Heineken Netherlands, the Provincial Government of South Holland, and Alterra Wageningen University. The idea is to implement programs around five themes (energy, water, raw materials, mobility and the living environment) with the natural environment as starting point and to connect diverse parties to the initiative. Some short and long term goals for the living environment are:

- More bee habitats in de region, in 2016.
- 75% of all land owners in the bee habitat actually participate in land management and design.

[24] (www.greencircles.nl, May 2017).

- 50% of all dairy farmers take measures which contribute towards a more beautiful landscape and added biodiversity.
- The green-blue infrastructure of the landscape will have increased by 20% in 2020 the value of the landscape is improved in terms of usage and perception for inhabitants and visitors.

Project leader Green circles: during our network day for the Green circles it was a frequently given compliment that the diversity of people attending the day was tremendous. From the deputy general and Heineken director to a bee keeper and farmer, Siemens, citizens, Eneco, other companies and the Dutch water boards they were all mingling and talking about their problems in the area. Something to really cherish as it delivers a lot of value because of the perspectives and insights from several stakeholders.

A good example, where the green circle project combined forces, is a waste water project. Heineken has almost clean but warm waste water which is emitted to the Old Rhine. The Dutch water boards do not like this and together with the University of Wageningen (agriculture) and the Dutch water boards they invented a purification swamp on the terrain of Heineken which can clean the water and remove the heat before putting it in the Rhine. A better and environmentally sound solution and they could have stopped there. However, they looked at the area and saw the potential to open it for the public. People can now fish here on a little fish jetty and leisure and enjoy nature, and people can use it for a Sunday walk or ride a bike.

Project leader Green circles: Together we made this possible and that because we have ambition, we trust each other and we see and talk to each other more often. We are going to experiment further and try new ways of purification together with the University. We need economic strong clusters and economics are affected by nature, recreation, chemical clusters and multinationals. Everything overlaps each other and there is where we help.

Renewi in WTC

Chemical recycling which is done at the WTC plant and for Renewi this fits their vision. Looked at the hierarchy of waste disposal, landfill adds the lowest value, burning with energy recovery like AVR has higher added value but then you destroy all the carbon. Renewi finds the re-use of carbon interesting because the CO2 isn't emitted in the air but a new material is made out of it. That is our vision and mission at Renewi, use less CO2, waste to new products. Big volumes of waste which are useless for recycling and have to be burned normally can now be used again.

Project leader: 'We believe in waste no more. It's not only waste does not exist but more a state of mind. If you see waste, do not destroy it but use it. If there are technologies which can turn it into new products and not into energy or heat we should try the new technologies to get the most added value out of waste. Also CO_2 tax is possibly coming and this would really be interesting for the WTC partnership. Waste burning will then have a tax on its output. Our customers will be interested because they would not have to pay these taxes in the future and this will give us a

competitive advantage. Actually, if this industry works, the fossil industry will completely change. When we 'cut' the carbon molecules from waste into C atoms, the chemical industry could find a way to turn it in the product of their choosing. Everything could be created with synthesis similar as playing with Lego. That would give a big impact for the chemical industry in Europe'.

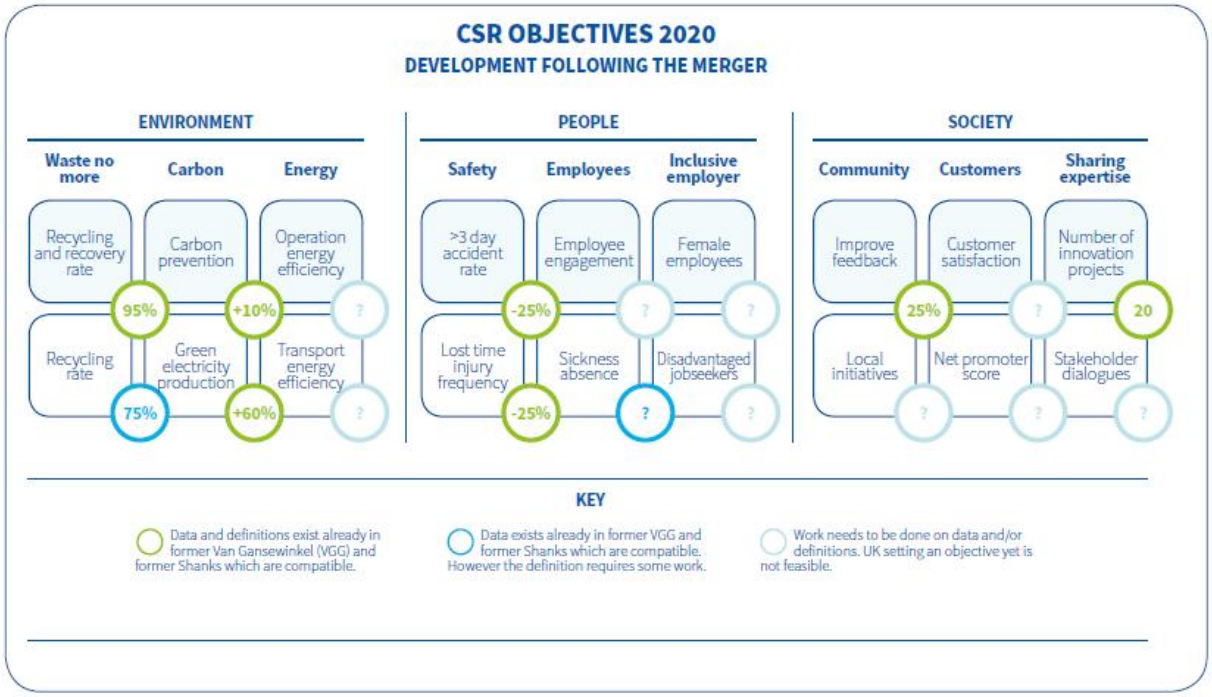
Renewi's strategic goals

Renewi has the strategic focus to deliver the benefits of the merger and next to this have the drive for growth. In their vision statement a longer term strategy can be seen. Renewi want to be seen as the leading waste-to-product company and they focus on making valuable products from waste, rather than on its disposal through mass burn incineration or landfill. In their CSR report the focus is on three areas; Environment, people and society. In short the strategy is to reduce the footprint, improve safety performance and create a good relationship with local stakeholders in the communities where Renewi is active.

Renewi and social metrics

Renewi is measuring the safety performance, equality and engagement. As can be seen in Figure 17 below, the start to investigate possible social indicators is on the agenda.

Figure 17: CSR objectives 2020 (Source: CSR report 2016)



7.1. WTC partnership barriers

This chapter describes the various observations collected from the interviews which have to do with the complicated nature of the partnership process. The observations have been divided in four main topics: Interdependency, communication, the individual perspective and conflicting interests.

Interdependent
The partners in the WTC project are interdependent and this is needed to realize this innovation but it also creates difficulties. The term interdependence in this thesis indicates that the partners are not dependent or independent from each other. The individual businesses of the partners can operate without the WTC project and their short term survival is not dependent of the WTC project. However, within the project, the WTC project only functions effectively when all actors are healthy and performing according to the goals (short and long term). Interdependency creates the opportunity to move past the core business of a company but it also means that the WTC strategy and operation needs a lot of bargaining before decisions are made. During the interviews interdependency became an apparent theme when AkzoNobel was under siege by PPG in a hostile takeover but also when Van Ganzewinkel joined Shanks and formed Renewi. The company's resources were drawn towards the core business either to keep the WTC project running or to aid colleagues in the complicated and time consuming task of integrating two companies. The individual extra effort of the project leaders was needed to ensure the progress of the WTC project during this time. Because of the interdependence the relationships in the partnership need to be managed more elaborate than a conventional supplier customer relationship. Rademakers (1998) suggests forming an intermediate organization as soon as possible in order to shield a large part of the individual partners' organizational challenges.

Communication
Communication and trust are key aspects mentioned during the interviews. One project leader stated that the addition of an extra partner would even complicate the matter further and therefore caution should be taken not to involve too many parties. With the current eight partners 28[25] relations are needed to communicate within the partnership. The addition of one extra partner will make 36 needed relations and is indeed a sincere concern and barrier of the partnership. Each organization in a network attempts to manage its individual relationships based on limited knowledge and a subjective view over the network.

Hakansson et al. (2002) describes:
A company in a network as an actor whose identity is defined by others in the network and who is living a life within individual relationships and within numbers of connected relationships. This life is both interesting and complicated as it places the actor in a number of intricate paradoxes.

[25] Formula from Rademakers, 1998, (n*(n-1)/2 = relations)

Hakansson et al. (2002) states that no partner has a complete overview needed to know how the network will operate and react. Knowledge is incomplete and therefore the only way to be successful is to learn by doing and to establish a deeper understanding of the different perspectives and needs.

Individual perspective

The individual role of the project leaders within the partnership is another observation during this research which has close relation to communication. Working for a large company brings in difficulties as not all information and details of programs and projects are known. Take AkzoNobel and The City of Rotterdam as an example.

AkzoNobel has over forty-five thousand employees which all (for argument sake) are contributing to the progress of the company. Several initiatives are being unfolded in countries and business units which cannot take place all at once as resources are often limited and the task of enrolling detailed programs. The persons in the partnership project cannot possibly know all even though the information within the company could be of important value for the partnership. Same thing goes for The City of Rotterdam. Eleven thousand employees, from different areas, work together on creating a more livable city. Social programs, economic projects, all work simultaneously and cannot be known when focusing on a challenging new concept. From the other side, information from the partnership is hard to get across to the own organization as well.

These information barriers could possibly hinder opportunities of improvement in the partnership which could have been applied because of mutual interests and knowledge. Cohen and Levinthal (1990) researched the absorptive capacity of individuals and organization and confirm the barrier of communication and knowledge transfer. The absorptive capacity is the capacity to obtain new valuable knowledge, assimilate it and apply it to create new innovative capabilities. Basic elements in prior knowledge are a shared language and values but also the knowledge of the latest technological developments. Communication between external and internal business is an important aspect in this theory. The theory is quite useful when looking at a partnership as the same characteristics can be applied. The project leaders in the WTC project are what Cohen and Leventhal call gatekeepers of information to and from their organization.

The gatekeeper is important part of the information chain and his or her individual absorptive capacity is only part of the absorptive capacity of his organization. The level of organizational absorptive capacity is not only a function of the gatekeeper's capabilities but also of the expertise of those individuals the information is shared with. According to Cohen and Levinthal (Ibid) the absorptive capacity depends on the individuals who stand at the interface of the organization and the external environment or at the interface between subunits within the organization. Taking care of the right project leaders with a large knowledge base and good communication skills is an important feature of a partnership. This way they can fully absorb knowledge to and from the partnership to and from their own organizations. The installed steerco does help to oversee the larger picture and aid in seeing what is going on in the individual organizations but they cannot

reach the detailed working level of the project. They will still have to rely on the information presented by the project leaders.

Conflicting interests

Also the roles and incentives from the other parties are sometimes difficult as the WTC innovation disrupts current businesses and established contracts. The City of Rotterdam for example has a long term contract with AVR to incinerate the waste from the city until 2030. This prevents waste from Rotterdam to be used for the WTC project. The waste will be imported from other parts of The Netherlands, Belgium and even England or from neighboring cities if that is possible. With this conflicting interest in place, there is less practical incentive remaining for Rotterdam to contribute to the partnership other than the bold vision of transforming the harbor towards a sustainable economy, the added jobs and taxes. AVR the counterpart in this relationship benefits from the long term contract and will see a part of their business shift towards the preferred chemical recycling. For AVR the WTC project is an unavoidable but disruptive innovation which will have influence on their current business model and possible future earnings.

Another conflict is the goal to minimize environmental impact and the need for sufficient waste to run the process. The waste which is needed has to come from as far as England and will create more environmental impact than when it is collected from nearby the WTC plant. Renewi and partners realizes this and are looking for other waste streams from adjacent municipalities and villages.

8. Local context

To create a good perspective about the issues which are material for the area research has been done using existing databases. How does the Netherlands relate to the SDG's as a wealthy and striving country, can they improve? What are items which can be improved and which items need extra attention?

The Organization for Economic Co-operation and Development (OECD), the SDG Index and Dashboards Global Report and the District monitor ('Wijkmonitor') are used to eventually align global goals, local goals and the social impact of the new WTC plant. Before use, an examination of the metadata has been done to determine the usefulness and accuracy.

The data sources indicate several areas of attention but not all are suitable to add value to from the WTC project. From the used sources; long term employment, air quality, sustainable consumption and the local selected opportunities for improvement in Rozenburg can be used by the WTC project to influence as these have a small operational, sectoral and geographical distance following Van Zanten (2015).

In the following chapters 8.1 – 8.3 the above mentioned data sources are used to determine the most important local topics of improvement.

8.1. The OECD

The Organization for Economic Co-operation and Development (OECD) has its roots in 1948, after the Second World War to improve cooperation and reconstruct Europe. Now, 50 years later their mission is to promote policies that will improve the economic and social well-being of people around the world and is composed of 35 member countries. The OECD[26] gathers data and provides a forum in which governments can work together to share experiences and seek solutions to common problems. They work with governments to understand what drives economic, social and environmental change and do this by data driven research from which internal standards are made for a wide range of subjects such as agriculture and tax to the safety of chemicals.

The OECD better life index, Better Life Initiative, launched in 2011, focuses on the aspects of life that are relevant to people and which are the foundations of the quality of their lives. The Initiative comprises a set of regularly updated well-being indicators and a detailed analysis of specific topics, published every two years in the 'How's Life?' report. The report is made for all the OECD countries as well as the OECD partners.

For The Netherlands, the report visualizes the general well-being of the Dutch and then focusses on several details such as child well-being, volunteering and well-being and measuring well-being

26 www.OECD.org.

in regions. The better life index finalizes the report of The Netherlands by showing the results of an online survey where people can give weight on eleven topics as show in attachment D. Derived from around 1200 participants, the top three topics are: life satisfaction, health and education. Compared to other OECD countries the How's life report for the Netherlands is positive but still there is sufficient room to improve on several areas.

A strength and weakness diagram is made (by the OECD) of all the investigated areas based on a ranking of all OECD countries which can be seen in Attachment D.

Table 3: How's Life in the Netherlands (2016) weakness overview[27]

Area	Explanation of area	Reason for weakness
Long term unemployment	Percentage of the labor force unemployed for one year or more	Between 2009 and 2014 the rate tripled to 2,98 and is above average of 2,6 Min 0,01 (KOR) Max 19,47 (GRC) (2014)[1]
Air quality	Population-weighted annual concentration to PM2.5, micrograms per cubic meter	NLD 16,82 AVG 14,05 Min 5,94 (AUS) Max 29,09 (KOR) (2013)[2]
Educational attainment	Percentage of people aged 25-64 with at least an upper secondary education	NLD 75,9% AVG 69,35% Max 93,19% (CZE) Min 33,70% (MEX) (2014)[3]
Social support	Percentage of people who have friends or relatives that they can count on in times of trouble	NLD 87,86% AVG 88,22% Max 98,56% (NZL) Min 75,28% (MEX) (2013)[4]
Stakeholder engagement	Composite indicator of formal stakeholder engagement in developing primary laws and subordinate regulations initiated by the executive (0 (min) - 4 (max) scale)	NLD 1,32 AVG 2,43 Max 3,45 (MEX) Min 0,82 (IRL) (2014)[5]

1) 'Labour Force Statistics', OECD Employment and Labour Market Statistics (database), http://dx.doi.org/10.1787/lfs-lfs-data-en
2) OECD preliminary calculations based on data from the Global Burden of Disease assessment (Brauer, M. et al. (2016) 'Ambient Air Pollution Exposure Estimation for the Global Burden of Disease 2013.' Environmental Science & Technology 50 (1), Pages 79-88).
3) OECD (2015), Education at a Glance 2015, OECD, Paris
4) Gallup World Poll, www.gallup.com/services/170945/world-poll.aspx
5) OECD (2015), OECD Indicators of Regulatory Policy and Governance (iREG), http://www.oecd.org/gov/regulatory-policy/indicators-regulatory-policy-and-governance.htm

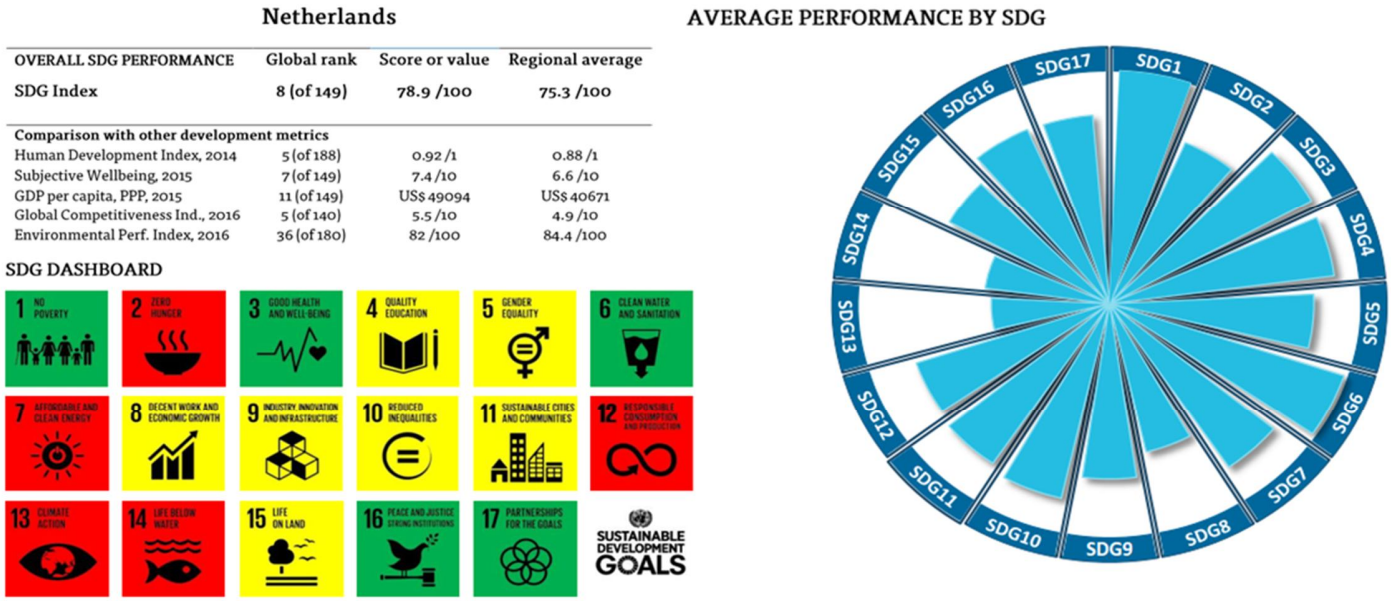
In Table 3 an overview of the areas with relative weakness can be seen (red marked have small sectoral distance to WTC project). When looking at the weaknesses in more detail, it can be seen that the bars in Figure 20 do not always represent the figures behind the visualization. For example, for social support the grey bar is drawn very short but the Netherlands is slightly below average.

[27] Source: Better Life Initiative 2016 Country Notes

8.2. SDG index

In 2016 the Sustainable Development Solutions Network (SDSN) and the Bertelsmann Stiftung launched the SDG Index and Dashboards Global Report to provide a report card for tracking SDG progress and ensuring accountability. The report is made so leaders and countries, who drafted the SDG's, can see which reforms are most needed to achieve their promises. The index consulted statistical organizations, members of the SDSN Leadership Council, the peer-reviewed literature, and international databases, including the World Development Indicator database (World Bank 2016), the Human Development Report (UNDP 2015), and OECD Statistics (OECD 2016).

Figure 18: SDG index visualizations for The Netherlands[28].



In Figure 18 it can be seen that The Netherlands still has to improve on several SDG's, to achieve the development goals. Numbers 2, 7, 12, 13, 14 are red in the dashboard. The average performance by SDG pie chart (right from dashboard) shows that 2, 8, 13, 14 and 15 are less filled but red number 7 is almost full. This does not make any sense as the two should more or less show. When looking at the data it seems that the two visualizations do not correlate and the pie chart is arbitrary. After examining the meta data behind the SDG index, it can be seen that the colors are based on expert opinion. Not all countries are incorporated in measuring the different metrics and so there is no sufficient data to make a sound comparison.

[28] Source: SDG index & dashboard country page The Netherlands.

Even though the colors and pie chart are subjective, the used data can easily be found and is often of a highly regarded organization. Also the way of calculating is transparent which makes it easily comparable with other data. Even though the first SDG index is imperfect, it does give an indication on where countries can improve.

In Table 4 the red marked SDG dashboard is explained as these should get the most attention (red marked have small sectoral distance to WTC project).

Table 4: SDG index weakness overview (Source: SDG index & dashboard country page The Netherlands).

SDG	Explanation of SDG	Reason for weakness
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.	The sustainable nitrogen management index (SNMI) indicates that too much nitrogen is used compared with the yield in crops of 0,7on a 0 - 1 scale[1]
7	Ensure access to affordable, reliable, sustainable and modern energy for all	1)The amount of CO_2 generated by fuel combustion is higher than 1,5 Mt CO_2/TWh for the recorded countries [2] 2)The low use of renewable energy 4,3% compared to average of 47% of top 5 performers[3]
12	Ensure sustainable consumption and production patterns	Non-recycled municipal solid waste 1,6 kg/person/year while AVG is 1.4[4]
13	Take urgent action to combat climate change and its impacts	CO_2 emissions from energy 10,1 tCO_2/capita while AVG is 4,8[5]
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Percentage of fish stocks overexploited or collapsed is 69,2% while AVG is 34%[6]

1) http://www.umces.edu/sites/default/files/profiles/files/Ranking%20Method_submit_to_SDSN_SNMI_20160705_0.pdf
2) http://www.iea.org/publications/freepublications/publication/co2emissionsfromfuelcombustionhighlights2015.html
3) http://www.se4all.org/
4) http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387133485261076 6/AnnexJ.pdf
5) http://data.worldbank.org/indicator/EN.ATM.CO2E.PC
6) http://epi.yale.edu/

8.3. District profile Rotterdam, Rozenburg

A closer look at the issues nearby the new WTC plant is done by using information provided by The City of Rotterdam. They launched a district profile monitoring instrument in 2014 to support a focused approach per district and composes of the following information. De figures used are based on data from registrations and surveys and come from the municipality, the police, firefighting department, CBS (statistical bureau Netherlands), governmental service for education (DUO), Union for Unemployed (UWV), environmental service Rijnmond (DCMR). The enquiries have been done in two large research projects for The City of Rotterdam: The District Research 2015 and Safety Monitor 2015.

The information is used to compare districts with each other and is updated every two years with objective and subjective scores from government registrations and surveys. A point system with average of Rotterdam at 100 indicates the score and colors are presented in an interactive so called 'horse shoe' diagram for easy analysis. In this chart, the color yellow presents the theme to be below the average and dark green presents the theme to be above the average.

Table 5: District profile themes translated from Dutch.

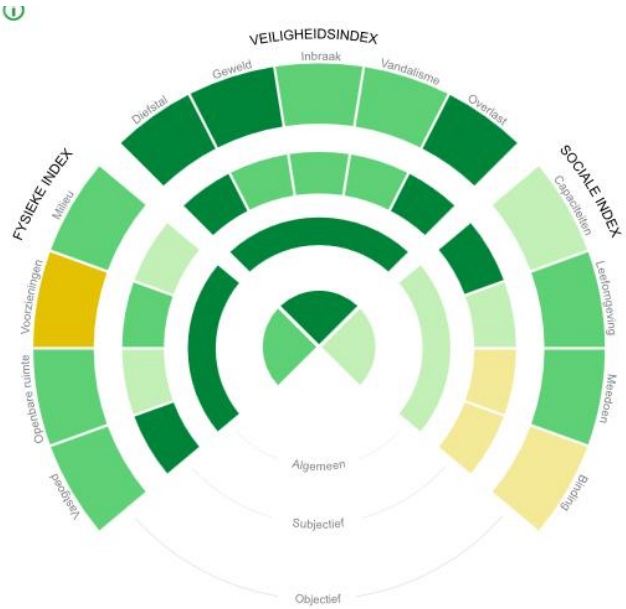
Safety	Social	Physical
Theft	Capacities	Housing
Violence	Involvement	Public spaces
Burglary	Living environment	Services
Vandalism	Connection	Environment
Nuisance	Quality experience of living	Living experience
Safety experience		

The 'horse shoe' is divided into three circles. The inner gives a general impression, the middle gives subjective impression and the outer circle shows an objective impression. An impression of the 'horse shoe' diagram for district Rozenburg, near to the location of the new WTC plant is shown in Figure 19. In Table 5 the various themes are described.

The data used to create this index score is also readily available on the same website and open for enquiry.

From the district profile it can be seen that subjective indicators; industrial noise (11/100) and industrial stench (13/100), are items which have a lower score than the average of Rotterdam (3/100 noise and 3/100 stench). Objective indicator; Percentage of houses within sound contour of 55 dB is 67% compared to Rotterdam average of 52%. Also subjective indicators trust future and connection in the government of Rotterdam can be seen as an opportunity for improvement.

Figure 19: Impression of index profile in "horse shoe" diagram for district Rozenburg



Source: http://wijkprofiel.rotterdam.nl/nl/2016/rotterdam/rozenburg, May 2017

See Table 6 below for the indicators which have a lower than average score within The City of Rotterdam.

Table 6: Selected opportunities for improvement in Rozenburg measured in 2016

Indicator (2016)	% Rozenburg	% Average Rotterdam
Industrial noise	11	3
Industrial stench	13	3
Houses within 55 dB	67	52
Says has confidence in district commission	43	45
Says has connection with Rotterdam	25	71
Says has confidence in future of Rotterdam	50	67
Says expects progress of Rotterdam	21	42
Says has confidence in municipal government	33	52

9. SDG's

In the previous chapters the WTC value proposition has been described, the strategic intents of the individual partners have been explained and the local circumstances are examined. The next step is to gather social indicators which fit the several gained perspectives (partnership, individual, local). Chapter 9.1 shows the result of a selection process which has been done with the help of the social impact manager of AkzoNobel. The result was a shortlist from the 169 SDG indicators which are relevant to the WTC strategy, the individual strategy of the partners and the local circumstances. Chapter 9.2 continues by choosing the right social impact method and illustrates how the PEM framework by Van Tulder et al (2016) contributes with a project management method.

9.1. Selecting SDG's

Because of the importance of the institution and the fact that the SDG's are agreed upon by 193 countries as explained in chapter 5.4, the SDG indicators will be used to select the appropriate indicators for the WTC partnership. The WTC partnership will have a positive, negative or neutral effect on society and this starting point combined with the method described by Van Zanten to retain a small operational, sectoral and geographical distance (2015) is used to select the appropriate goals and indicators.

A global indicator[29] framework was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and agreed to, as a practical starting point at the 47th session of the UN Statistical Commission held in March 2016. The list includes 230 indicators on which general agreement has been reached. The list has been shortlisted together with the social impact manager of AkzoNobel and 21 primarily social indicators were taken from the total of 230. In Table 7 the selected goals for the WTC project without indicators.

The SDG shortlist (21/230) was composed by selecting the social goals from this framework which can be influenced by the WTC partnership. The shortlist has relevance to the WTC partnership, the individual strategic goals of the partners or local circumstances. Social goals which exclusively need governmental influence were not incorporated as well as environmental goals such as CO_2 savings. These are relevant for the WTC partnership but out of scope of this thesis. Also, goals with a large operational, sectoral or geographical distance are not selected (neutral). The nature of the SDG's ensures that some overlap between the selected and not selected social impact and environmental impact exist. In Appendix A, the full list of selected social SDG's including indicators and explanation is shown with respect to the WTC partnership.

[29] The global indicator list is contained in the Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (E/CN.3/2016/2/Rev.1), Annex IV.

Table 7: Selected SDG's for the WTC project from the global indicator framework

	SDG's
Goal 5	**Achieve gender equality and empower all women and girls**
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**
Goal 10	Reduce inequality within and among countries
Goal 11	**Make cities and human settlements inclusive, safe, resilient and sustainable**
Goal 12	Ensure sustainable consumption and production patterns
Goal 14	**Conserve and sustainably use the oceans, seas and marine resources for sustainable development**
Goal 17	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

As can be seen in the selected goals (Table 7) the focus of the WTC project should lie on the bigger organizational culture within the new plant. Focus is needed as the WTC partnership cannot add value to all SDG's. The social goals can be summarized in three areas:

1. Improving well-being of the community and employees;
2. Creating an innovative and knowledge driven organization;
3. Mitigation of negative aspects.

1) Improving well-being of the community and employees

Ensuring equal rights for women and a fair distribution of male and female managerial positions are implemented within AkzoNobel. Creating a safe work environment for employees and contractors is of great importance for WTC partners. Within the chemical industry safety has the highest priority for decades and is therefore easily implemented as programs and work methods are already used. Other goals are less known within the partnership. According to goal number 8, the new WTC organization should interact with its surroundings to create social impact. One way is to involve the less fortunate (disabled) in the Dutch (Rotterdam) community by providing them a decent job and find their way in society. Getting these vulnerable people out of their negative social position will help to raise their income and reduce inequality of income between people as well. It will furthermore lower the long term employment rate which needs attention in the Netherlands as presented in chapter 8.1, Table 3.

During the interviews it became apparent that Renewi has some experience with this form of sustainability by providing jobs in their sorting stations. Furthermore, The City of Rotterdam has a project in place which provides subsidies to help the disabled that have a larger distance to the job market[30].

[30] https://www.rotterdam.nl/werken-leren/sociale-werkvoorziening/

The WTC organization could also help educate and inform the public and children by initiating guided tours about recycling and sustainability as is being done in the first plant in Canada. This would also help to improve the relationship with the people in Rozenburg which have a low confidence and connection with The City of Rotterdam (chapter 8.3, Table 6). Again, Renewi has experience with this kind of knowledge exchange as they organize a yearly waste festival where children and parents can see and learn, in a fun way, how waste is recycled and what could be improved at home.

2) Creating an innovative and knowledge driven organization

Higher scientific jobs should be attracted by forming the R&D knowledge center which targets sustainable industrialization and a circular economy. Start-ups working together with the partnership and large companies, clients of the partnership, universities, other countries and schools to create new solutions to further develop the waste to chemicals concept. One example could be to retrieve waste from the WTC customers so that circularity of the chemical system is further developed. The WTC concept is unique and could serve as a role model for the next sustainable economy. Creating a complete sustainable business model by incorporating social impact will also attract job seekers more than less sustainable competitive companies, increase loyalty and will lower pressure on pay structure according to Van Tulder et al. (2014). Furthermore, typical for the chemical industry, knowledge and innovation within the new organization is needed to improve the process of the WTC plant. Substantial knowledge is needed to create Life Cycle Assessments which indicate where the biggest impact on the environment is. Analytic capabilities, creativity and specific technological knowledge are needed to improve the WTC concept even further by using latest technologies in logistics and production processes (Heizer & Render, 2014). Using the knowledge driven organization to not only create and optimize economic, but also social and environmental impact.

3) Mitigation of negative aspects

The WTC project also has negative side effects and these should be mitigated as far as possible. For example, the particle matter that is emitted (according to environmental permit) from the plant and by needed truck transport should be limited. In the densely populated country, particle matter is a reason for concern as is shown in chapter 5.6. This can be done by seeking collaboration with external partners such as universities, NGO's, municipalities, schools, technology suppliers and clients. AkzoNobel itself employs toxicologists within the research department which can aid in examining the particular WTC particle matter and establish the potential harm to people. Next to toxicologists, AkzoNobel has several scientists in Sweden who are specialized in Life Cycle assessment and work in cooperation with the IVL Swedish Environmental Research Institute[31]. This institute has developed the EPS (Environmental Priority Strategies) method, a systematic approach to choose between design options in product and process development. The basic idea behind this method is to make a list of environmental damage costs available to the designer in the same way as ordinary costs are available for materials, processes and parts. This method could

[31] http://www.ivl.se/english/startpage/pages/focus-areas/environmental-engineering-and-sustainable-production/lca/eps.html

give an understanding of the induced cost due to illness by the emission of particle matter and will be further explained in chapter 9.2. Another negative aspect of the WTC project could be stray waste and marine pollution and should get some attention as the WTC will need to handle large quantities of plastic waste and is located in the harbor.

9.2. Social impact methods for selected SDG's in WTC

The SDG indicators have been chosen according to the strategic intent of the WTC project, the local social needs and the individual partners strategic intents. The indicators are primarily output oriented and the SDG indicator alone will not be sufficient as social impact is the objective of this thesis. This chapter will choose the most appropriate method of impact measurement using a valuation technique of the Social Capital Protocol from the WBCSD. In attachment E, the valuation technique is shown and it can be seen that three main methods; Quantitative, Qualitative and Monetary can be used according to the specific possibilities of the chosen indicator. For each of the three areas (Improving well-being of the community and employees, Creating an innovative and knowledge driven organization, Mitigation of negative aspects) one example will be elaborated to show how the method is used in practice when implementing the valuation technique (attachment E) and the PEM framework explained in chapter 5.8. Using this model, Individual performance, Organizational performance, Partnership performance and Society effects can be analyzed and corrected during the partnership project using four impact loops (Van Tulder et al. 2016).

There are two types of indicators for AkzoNobel: Internal and external. External is used for reporting and engaging with stakeholders. Internal are used to follow performance, set targets and improve performance to create a better business. AkzoNobel shares the results of its business with the world in their annual report and have hundreds of locations. Without an institutional indicator, the report would be unreadable if all kinds of indicators and measurement units are used that are developed using the necessities of the local communities. For example: quantities of PM2.5 are not recognized by the layman, neither is it a problem in all parts of the world. Institutionality is needed and money is the fact that is accepted and understood. The monetization method is therefore preferred to share the outcome of the social impact of AkzoNobel with the world.

Hereunder, one example per area is given on how to practically use social impact measurements by using the SDG indicators and valuation technique from the Social Capital Protocol. For each example a strength and weakness is also shown.

1) <u>Improving well-being of the community and employees</u>
One of the goals to achieve this is SDG 8.5.1:

By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

The indicators are:

1. Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.
2. Unemployment rate, by sex, age and persons with disabilities.

The first indicator will be influenced by the WTC project by providing jobs for this target group and will have an effect on the second which can be measured by The City of Rotterdam, the Province or by The Netherlands as a country goal. The first indicator will be used to show how this indicator could be used in practice.

The chosen valuation technique:
For this indicator, a monetization method named value transfer is selected. With the value transfer method value estimates from existing economic valuation studies are used to determine the added value, expressed in currency. Data is used to get key variables from different studies. In this case to compare the raise of GDP per person because of their employment at the WTC plant.

The Strength of this valuation technique is that the needed data is easily collected and can be scaled-up from a project based initiative to a companywide strategy. Benchmarking across companies and industries can be done when the same values and data are used.

The Weakness of this technique is that value made in money does not ensure a positive impact for the involved people. The studies must be of high quality and peer reviewed to assure the validation of the used values. One way to mitigate the weakness of the value transfer technique can be to add an opinion survey in the form of a well-being assessment amongst employees. AkzoNobel already does have a survey from Gallop, it does however not contain happiness until now. Happiness is used throughout the world as is explained in chapter 5.4 and offers the possibility to compare results easily.

A second way is similar to the valuation technique and offers a more general correlation on the increase of income and employment. Stavrova et al. (2011) have investigated that unemployment is one of the most destructive life experiences known to man. Contributing to employment will therefore have a positive impact on the life of a disabled person. This is a method which does not need a lot of effort and it can be used to indicate a theoretical increase of happiness of the involved people. The method will however give a general subjective conclusion and because people and circumstances differ, a well-being assessment that targets individuals will be needed to measure and benchmark actual individual increase of well-being. Further research is needed to investigate this second option.

The PEM framework will be used to manage the efforts and outcomes of this indicator to achieve positive results. Hereunder, an example is shown of the PEM framework using the chosen goal and indicator:

- **Issue:** Lower employment rate and unequal pay for disabled people;
- **Mission:** SDG 8.5.1;

- **Input:** Subsidy from government, resources (time, training, money) of WTC waste (Renewi) or plant operator (AVR). Program from WTC organization perhaps in partnership with NGO or health organization;
- **Throughput:** Short term determination of actions to be taken (contact NGO, acquire budget for training, determine work for the target employees);
- **Output:** Analyze outputs of the taken actions (training according to needs? Work circumstances sufficient for target employees?
- **Outcome:** Average hourly earnings of female and male employees, by occupation, age and persons with disabilities;
- **Impact:** 1) Monetization through Value Transfer and; 2) A well-being assessment.

2) Creating an innovative and knowledge driven organization

One of the goals to achieve this is SDG 12.5.1:

By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

The indicator is:

1. National recycling rate, tons of material recycled.

The WTC project will contribute to it as it will recycle waste. The partnership can even increase their recycling further by providing knowledge to children and the community when the partnership partners with, for example, the Rozenburg community. This could be a good opportunity to extend the WTC partnership for a longer term and influence the consumption and recycling pattern of the community together with the Rozenburg district (City of Rotterdam) and neighboring schools. This would also address SDG 12.8:

By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

With indicator:

Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.

The chosen valuation technique:

The chosen valuation technique is market price. The market prices technique is a monetization technique which uses market price of goods or services. The course on recycling at the WTC plant is a service like a normal course where knowledge is shared. A market price can therefore be used for the provided service for each participant.

The Strength of this valuation technique is that the needed data is easily collected. It is an easy to understand method which is transparent as it is based on market prices. When a sound market price is found for the provided experience in the WTC plant it should also reflect a willingness to pay of the participants. This makes it even more transparent according to the SCP.

The Weakness of this technique is that value made in money does not ensure a positive impact for the involved people and recycling. It does not reflect the achieved impact but reflects the output created by the WTC partnership. Multiple perspectives can be used to determine the market price as it is fictional even though it is based on market price. The value can easily be overestimated or underestimated as no commercial proof of the market price for this typical WTC recycling experience can be given. An obvious option would be to track the recycling rate from the targeted community to see the impact as this is the actual indicator. This will require quite some data as it is dependent on the consumption pattern of the community and the number of people in the community. Another solution for measuring the impact is by surveying each participant after a visit. The survey should answer if the participant has changed its consumption pattern and started recycling after the experience?

The PEM framework will be used to manage the efforts and outcomes of this indicator to achieve positive results. Hereunder, an example is shown of the PEM framework using the chosen goal and indicator:

- **Issue:** Increase national recycling rate, tons of material recycled;
- **Mission:** 1) SDG 12.5.1. and 2) SDG 12.8.1.
- **Input:** Resources from government, resources (time, training, money) of WTC waste (Renewi) or plant operator (AVR). Program from WTC organization perhaps in partnership with NGO or district of Rozenburg;
- **Throughput:** Short term determination of actions to be taken (create program, design experience, target community, measure impact);
- **Output:** Analyze outputs of the taken actions (is the program delivering a great recycling experience, is the program running according to stakeholder requirements, is personnel sufficiently trained to facilitate the experience?
- **Outcome:** People educated and rendered total service in Euro.
- **Impact:** 1) Survey WTC experience, 2) measure behavior in consumption and recycling.

3) <u>Mitigation of negative aspects</u>

One of the goals to achieve this is SDG 11.6.1:

By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

<u>The indicators are:</u>

1. Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities.

2. Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

The first indicator will not be influenced by the WTC project and therefore isn't relevant for this thesis. The second indicator will be used to show how this indicator could be used in practice.

The chosen valuation technique:
The chosen valuation technique is the HALYs technique (Health Adjusted Life Years). HALYs technique is a monetization technique also know under various forms and names. It can be used to measure to morbidity and mortality associated with different health conditions such as injuries or illness. A scientific database created from research serves as a consistent basis to compare outcomes with. AkzoNobel has scientists (in Sweden) who use this method in LCA (Life Cycle Analysis) studies. The IVL Swedish Environmental Research Institute[32] has developed the EPS (Environmental Priority Strategies) method which is a systematic approach to choose between design options in product and process development. Another similar method used by Greenpeace and developed by EcoSenseWeb[33] which targets the YOLL (Years of Lost Life) of people because of emissions generated by industrial activities.

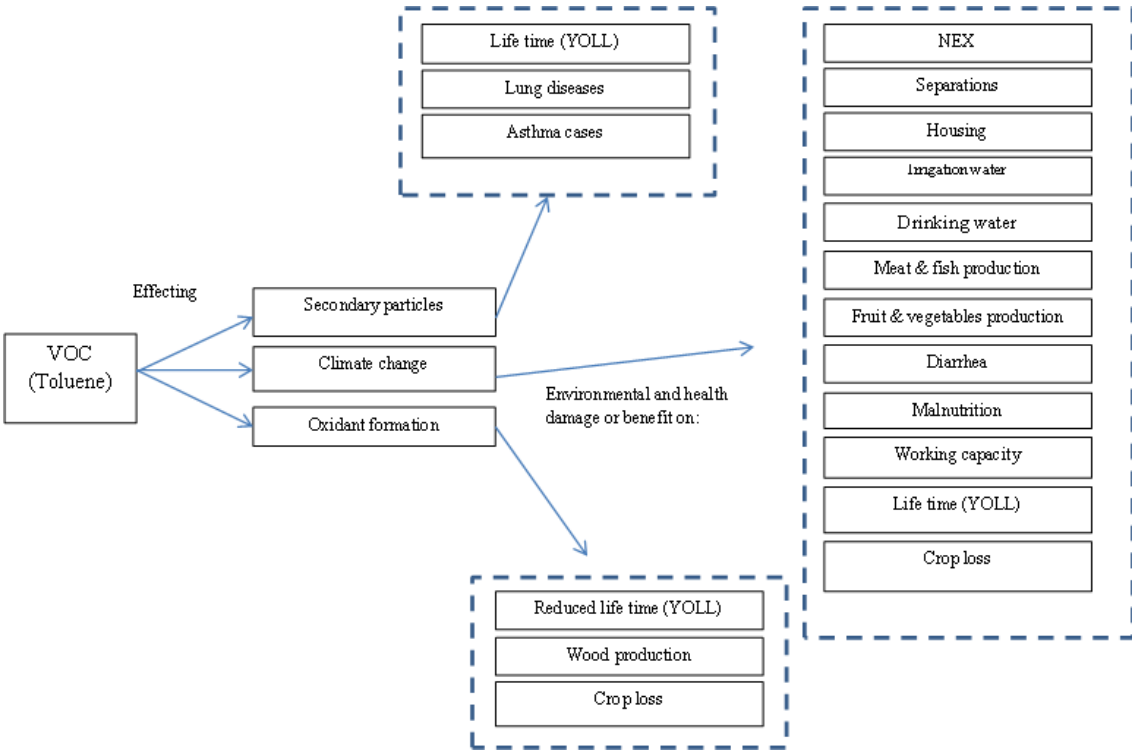
The Strength of this valuation technique is that the needed data has a scientific basis, is transparent and can be reproduced, benchmarked with others and structurally improved. Furthermore, this method has an international standard (ISO14040-43) for LCA and is checked and monitored. Another positive aspect is that the actual social impact of particle matter can be seen by society even though society may not notice the effects themselves because the particles are too small. The outcomes are also monetized which is needed for communication purposes in the annual report.

The Weakness of this technique is that the technique uses specific scientific resources which are expensive and time consuming. When the data is gathered the output (PM2.5) needs to be measured and the data has to be reviewed after gathering new insights. A negative effect of the indicator was found after consultation with AkzoNobel researchers and LCA specialists. The question was asked about what kind of particle matter was emitted and what the toxic properties were. According to the scientist, not every particle creates the same effects. This could be investigated further by the partnership using AkzoNobel toxicologists.

The EPS method used several databases such as IPCC (Intergovernmental Panel on Climate Change) and OECD and has monetized the damage caused by PM10 and calculated it to be €51,37 / kg and for PM2.5 it is €121,52 / kg. An example of the effects of a volatile organic carbon (Toluene) and the EPS method is shown in Figure 20.

[32] http://www.ivl.se/english/startpage/pages/focus-areas/environmental-engineering-and-sustainable-production/lca/eps.html
[33] http://ecosenseweb.ier.uni-stuttgart.de/

Figure 20: An example of the EPS method for damaging effects of Toluene (not emitted by WTC but serves as an example because PM10 and PM2.5 have not been developed in a schematic way as presented below)



Source: AkzoNobel, LCA specialist, June, 2017

The PEM framework will be used to manage the efforts and outcomes of this indicator to achieve positive results. Hereunder, an example is shown of the PEM framework using the chosen goal and indicator:

- **Issue:** Annual mean levels of fine particulate matter.
- **Mission:** SDG 11.6.1.
- **Input:** Resources from R&D and international databases such as IPPC and OECD collected and analyzed by the EPS method.
- **Throughput:** Short term determination of actions to be taken (start-up R&D effort, develop technology with suppliers and scientists to mitigate or compensate particle matter effects, lower radius of collected waste, are actions taking effect?).
- **Output:** PM2.5 emission and PM10 emission in kg/annual.
- **Outcome:** Damage to life in Euro's using EPS method.
- **Impact:** Damage to life in health effects determined using EPS method.

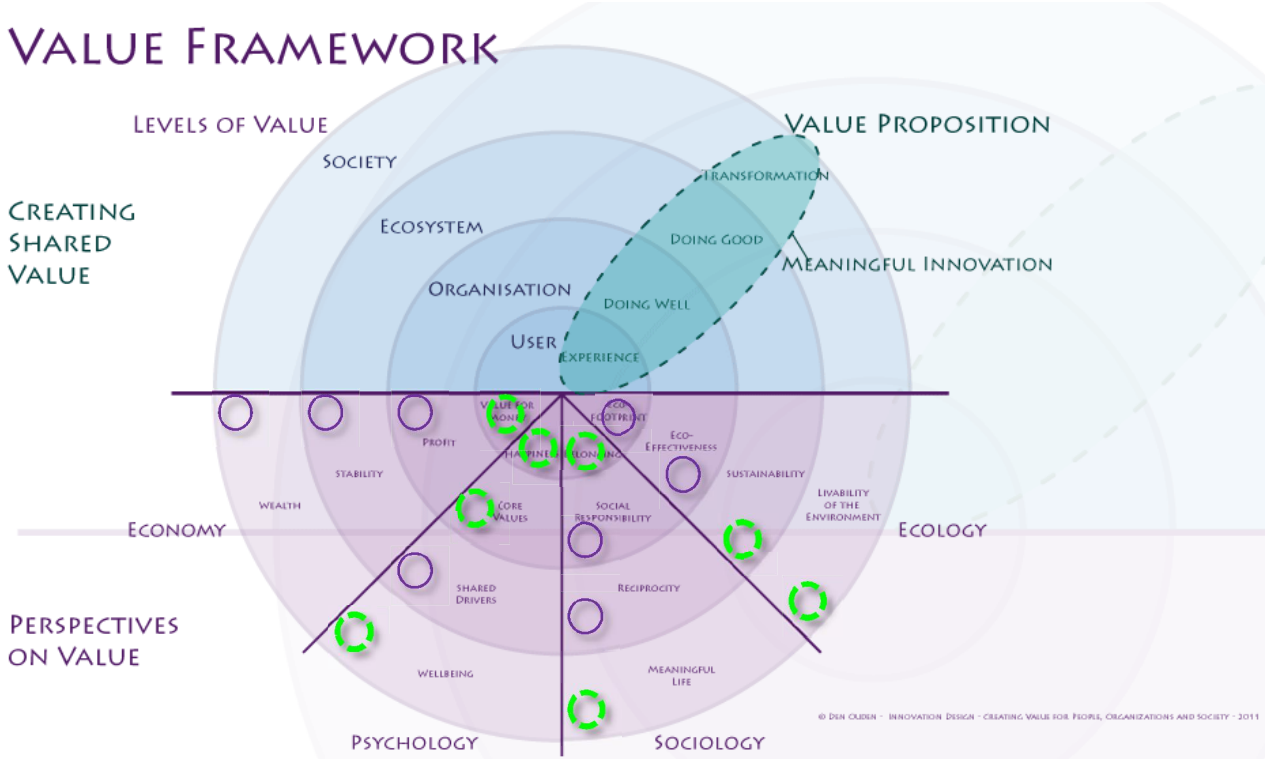
10. Value proposition analysis

In this chapter the current value proposition of the WTC partnership is analyzed using the value framework from Den Ouden (2012). The current value proposition is enhanced with the findings of this thesis: '*Shared value creation through partnerships and social impact'* to show where value can be created. This could be added to the WTC value proposition. The current value proposition has been created using the retrieved data from interviews and received documents from the WTC partnership. The aim is to create shared value (a meaningful innovation from Den Ouden) which from a holistic perspective is more than the sum of its parts (Ibid).

10.1. The value proposition analysis of the WTC partnership

In this chapter the current WTC value proposition is explained in more detail in order to see why and what value is missing and can be added. In Figure 21 the value framework of the WTC partnership using purple and green markings. The purple markings indicate where the WTC project has written or verbally expressed plans to add value. The green markings indicate where value can be added by using the knowledge of partnerships and social impact.

Figure 21: The shared value framework for the WTC project (adapted from Den Ouden, 2012)



Current WTC value proposition

WTC Creating Shared Value proposition

Each perspective (economy, psychology, sociology and ecology) in the value framework has its own perspective on value but they also overlap. Each level (user, organization, ecosystem and society) also has its own value perspective and they overlap as well. The value system is complicated and needs further explanation as it is also made in the perspective of this research. For a more general explanation of the value framework, chapter 5.1 can be consulted.

The economic perspective

From an economic perspective, the new plant will bring in jobs and taxes when operational so economic *wealth* is created. The WTC project will add value by ensuring *profit* for all partners. This still has to be proven in time but the method of project management and the reciprocity used starting assumptions during negotiations should ensure this. The project has agreed to use the normal market prices for all used materials within the partnership. The business case is still under development and funding will fill in the financial gaps but this will create the partnerships *stability*. Individual *value for money* is not known yet but could be added when The City of Rotterdam for example will lower waste taxes when people will recycle and separate their waste to be used in the WTC plant. An information and documentation system such as Sinzer[34] can assist in ensuring that the input of individual partners is awarded with an equal amount of output. Sinzer is a company which specializes in SROI and has created an online tool to document the goals and results of partnerships. The tool makes it easier to communicate as all partners have access to the online tool which can be used to share information and view the results of the partnership. Note: Through this research, AkzoNobel has evaluated the cooperation with Sinzer and is determining possible cooperation.

The psychological perspective

From a psychological perspective, the WTC project clearly has *shared drivers* as can be seen in chapter 7 (table 2) as the partnership is strategically aligned. The WTC project is not aiming at *individual happiness* by providing a pleasurable experience for consumers such as Apple is doing with the iPhone. However, it could potentially lower individual happiness by creating an atmosphere of noise and emissions from the WTC plant. The community in Rozenburg already has more industrial noise and stench nuisance than the average in Rotterdam. Caution has to be taken not to increase these negative figures. The Dutch regulations will most probably prevent this from happening even though the government does not always apply sufficient regulations to prevent this from occurring. A good example is the Chemours plant in Dordrecht (The Province of South Holland, The Netherlands) where emissions of Gen-X are causing public concern and questions in parliament. According to Dutch media[35], the substance has been found in drinking water used in large parts of the Province. The University of Amsterdam has done research and found Gen-X in nearby gardens. The University advised the public near the Chemours plant not to eat home grown vegetables and fruits.

[34] http://www.sinzer.org/nl, accessed may, 2017.
[35] https://www.volkskrant.nl/binnenland/omgeving-chemiefabriek-chemours-blijkt-sterk-vervuild, 21 July 2017, 06:00.

These kinds of serious problems and bad publicity causing environmental damage, social and economic damage, should be mitigated by also looking at the negative parts of the project.

The WTC plant will also need natural resources such as water and air. Known is that the WTC process will emit particle matter (PM) to the atmosphere during the gasification of the waste. Transport of waste is needed which creates CO_2 and PM next to adding traffic to one of the most used highways in The Netherlands. Most probably these negatives are equal to the current incineration or landfill techniques but sill creates an undesired use of clean air.

Mitigation of negative aspects is done by making it tangible using the latest LCA methods and setting targets to lower the PM emissions further than permitted. This will not only prevent a negative image but can also lead to new innovations spin-offs. Cooperation with the new envisioned R&D center and universities such as Wageningen and Delft can lead to new innovations and start-ups which can confront this important topic in The Netherlands and the world. The SDG goal (11.6.1) mentioned in chapter 9.2 can be a valuable KPI to track progress.

> *SDG 11.6.1: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.*

At this moment of time, the *shared core values* of the WTC partnership are not yet described in the project. This would be highly preferred as the *core values* of an organization contribute to the creation of value and motivation for its management and employees next to represent the overall reason of being (Den Ouden, 2012). The start of the company will create a culture which, according to several organization scientists, cannot be changed easily. In the book 'Images of Organization' from Morgan (2006) it's explained that organizations are in essence socially constructed realities in the minds of the members which are similar to concrete structures, rules and regulations. Will the WTC organization dispose of waste or will it create new materials? Will the organization be open to the environment and for the community or closed and egocentrically focused on the operation within the gates? Morgan states that successful organizations build cohesive cultures around common sets of norms, values and ideas that create the focus needed to achieve strategic goals (Morgan, 2006).

The WTC plant is actually in the conception to become a new company and the organizational culture of the WTC is born during this phase according to Schein (1990). Values, standards and beliefs taken by management or the leader of the new company at this time are slowly taken up by staff when these actions prove to be successful. In the long run, these values and norms become self-evident and are then described as culture. It takes a lot of effort to change the organizational culture of an older organization compared to a young organization which is able to change faster and more smoothly.

Well-being is left open in the current value proposition because the WTC concept has not fully matured. It could be argued that value is added for well-being because the innovation lowers CO_2

in the atmosphere and through this way combat climate change which will maintain the current welfare state. Adding value on several levels in the psychological perspective as described above could add to the well-being within society even though it seems a bit far-fetched. Well-being from a psychological perspective has a lot of similarities with the sociological perspective and in the next paragraph ideas are presented which add value on both views.

The Sociological perspective

From the sociological perspective the *sense of belonging* is interesting as the investigation in chapter 8.3 (Table 6) has shown that the people in Rozenburg do not feel connected with The City of Rotterdam. The people in Rozenburg have a low confidence and a low expectation of progress in the municipality of Rotterdam. The WTC partnership could involve the local residents in the project by inviting school children and residents to visit the site just as the first Enerkem plant in Canada is doing by cooperating with the municipality. Creativity is needed in the partnership to develop other initiatives which can add to this form of value.

On the organizational level, *social responsibility* is strongly present in the partnership as one of the most important aspects indicated by all partners is to transform the economy to a sustainable economy using the Enerkem technology. *Reciprocity* is still under construction and the WTC relations are recently being formed. Reciprocity requires that in the partnership, all parties have different value added services and strengths and competences. The return payment can be in money but also in other value, depending on the receiving party. (Den Ouden, 2012). The mechanisms in place using clear organization structure and a transparent way to divide work and costs show that reciprocity will be incorporated. Communicating the results to all partners can be a resource draining task. Again, a tool like the one from Sinzer can be a valuable asset to cover this challenge. However, not all relationships need to be directly reciprocal and can be indirect as is done with a third party or it can materialize over time. The long term stability needs to have all interdependent partners balanced to make the partnership work (also see chapter 5.5).

On a societal scale, the creation of a *meaningful life* requires to involve as much people to the WTC partnership as possible and let them contribute with their own strengths and competences. Taking care of the community and employees could be done by creating the research and development center next to the WTC plant focusing on SDG 8. The goals of the intended research are focused on creating a sustainable economy by using advanced technology. The spin-off firms are most often driven by individuals who work from an ideology and who do not conform to current state affairs. Another way is to involve people with a distance to employment by cooperating with The City of Rotterdam or the Province of South Holland. SDG goal (12.8 & 12.5.1 & 8.5.1) mentioned in chapter 9.2 can be a valuable KPI to track progress.

> *SDG 12.5.1: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature. & SDG 12.8: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. & SDG 8.5.1 By 2030, achieve full and productive*

> *employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.*

The ecological perspective

The ecological perspective adds value by lowering people's *eco footprint*, even though they might not know that their waste is being recycled and turned into a new material. This could be enhanced by education on recycling so that people will make conscious choices in what they buy and how they dispose their waste. For this project there currently are no plans to create such added value but several interviewees were open to the suggestion. *Eco-effectiveness* of all partners is increased and is one of the reasons of conception of the WTC project in Rotterdam. AkzoNobel analyzed their Eco-effectiveness and realized that Methanol had a large impact on their footprint. The Enerkem technology was chosen for collaboration. By doing this, not only the footprint of AkzoNobel will be smaller but it will also differentiate itself from competitors by creating new products that are hard to duplicate. Succeeding in the challenge of the partnership comes with the reward of a barrier for imitation from competitors.

Sustainability for organizations seems an easy to achieve value because of the WTC technology. However, sustainability is not only technology driven as this thesis is also trying to convey. To sustain is to thrive for a longer period of time by behaving in a respectful way with the surroundings. The following list is not exhaustive but personnel, community, suppliers, customers, environment, finance, must all be sustainable. Sustainability is the triple bottom line and needs to address the future by ensuring the same possibilities and resources for future generations. Sustainable values preserve, restore, and enhance companies while generating renewable resources, innovation, advantage and prosperity (Friedman, 2009). This value has been left out in the current value proposition as not all areas have been addressed actively by the project team. They can be added using the insights created by this thesis.

Finally *livability of the environment* is about preserving natural surroundings as it contributes to well-being and health but also physical beauty is an important value. An AkzoNobel researcher specialized in Life Cycle Analysis (LCA) indicated:

'It can be easily proven that nature has value for humans when they go on vacation. Most people go to places with an abundance of nature and beautiful scenery.'

As mentioned in the psychological perspective, SDG goal (11.6.1) mentioned in chapter 9.2 can be a valuable indicator to track progress.

> *SDG 11.6.1: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.*

10.2. The shared value proposition of the WTC partnership

This chapter concludes and summarizes the outcome of the value proposition analysis. The shared value proposition of the WTC partnership is summarized into one general recommendation.

The societal business case is the summit of sustainability according to Van Tulder and Van der Zwart (2006). New sustainable value creation and innovation is introducing new business models to foresee in the needs of the world by forming partnerships and system transitions.
The WTC partnership is well developed to achieve this level when social impact is incorporated as is shown in this thesis. Improving the value proposition as shown in Figure 21 will create a partnership that does not only recycle waste to chemicals but also will provide the full spectrum of what sustainability has to offer.

According to Kurucz et al. (2008), the benefits of a sustainable business case is that costs and risks are reduced, legitimacy and reputation are strengthened and a competitive advantage is obtained. Furthermore, the shared value creation will be the starting point of new valuable innovations which will strengthen the WTC partnership further. A bold strategy is needed to not get 'stuck in the middle' and a clear and open organization will be recognizable for the public. Such a bold strategy will also make the partnership more resilient in times of crisis Van Tulder et al. (2014).

For the WTC partnership the following recommendations are advised but are not exhaustive as creativity and entrepreneurship are needed to create a sustainable business model that is unmatched in industry. A key element is the partnership itself. Without the partnership the core business of the individual partners are too far from the societal goals. The WTC partnership has to rely on the competences of the individual partners to be able to make this proposed business model work.

Improving well-being of the community and employees

1. The community of Rozenburg is having difficulty connecting with The City of Rotterdam. The waste to chemicals partnership can bridge this gap by involving the people in Rozenburg with the project. Education for children and knowledge sharing for adults are examples how this can be done. The province of South Holland, the Port of Rotterdam, Renewi and The City of Rotterdam have stated these types of goals in their strategy.
2. People with a larger distance to employment need to be involved. This is one of the SDG's (no. 8) and The City of Rotterdam has a program in place to further develop this goal for the WTC partnership. The interview results showed that Renewi has experience in how to do this.

Creating an innovative and knowledge driven organization

1. Create an open and innovative culture for the WTC plant to be able to facilitate the involvement of for example disabled people and the local community. Also the employees should be open for innovation and change to be able to assist the researchers during their experiments. The core values of the new company and employees should be developed before the start of hiring people.

2. From the literature study the measurement of happiness is advised for all employees. The measurement of happiness will give the most complete view of the circumstances in the plant. AkzoNobel has an elaborate Gallop questionnaire in place. However, this questionnaire uses ambiguous questions such as: do you have a best friend in the working place? Not every culture will relate to this. Happiness has an institutional value which is largely the same worldwide.
3. The plans of a new research and development center are an excellent addition of the current value proposition as they contribute to several SDG's and goals of The Province of South Holland, Port of Rotterdam and the SDG's. The research center should be in close cooperation with local universities and institutes, but also with the plant to aid in the optimization and expansion of the process. For example, research can be done to process waste streams from customers of Air Liquide or AkzoNobel so the business model can lock-in the customers. Locking-in customers is a way to keep customers by linking more part of the businesses together. This makes it harder for a customer to switch to a competitor according to Amit & Zott (2012).

Mitigation of negative aspects

1. Even though the Enerkem technology is groundbreaking and has the potential to improve the way we handle our waste it also has negative side effects. Acknowledging these side effects and actively taking steps in lowering the negatives is an important part of a sustainable partnership. The research and development center can possibly aid in finding a solution together with the WTC partners, nearby universities and start-ups. The SDG's as well as the Province of South Holland have goals in place to create a (more) healthy and safe(r) living environment.
2. Pay extra attention to lower stench and noise as this is a negative issue for the people in Rozenburg. Even though the environmental permit will foresee in this, extra caution has to be taken during the design phase of the WTC plant.

Adding these societal goals which fit the SDG's will create a bold business model which not only has a clear focus visible from the outside but also takes care of the triple bottom line. The WTC partnership can cover all perspectives of value to a larger or lesser extent. The WTC partnership has all the knowledge in place to create a meaningful innovation which can be the start of a transition of our current industry and economy.

11. Conclusion and recommendations for further research

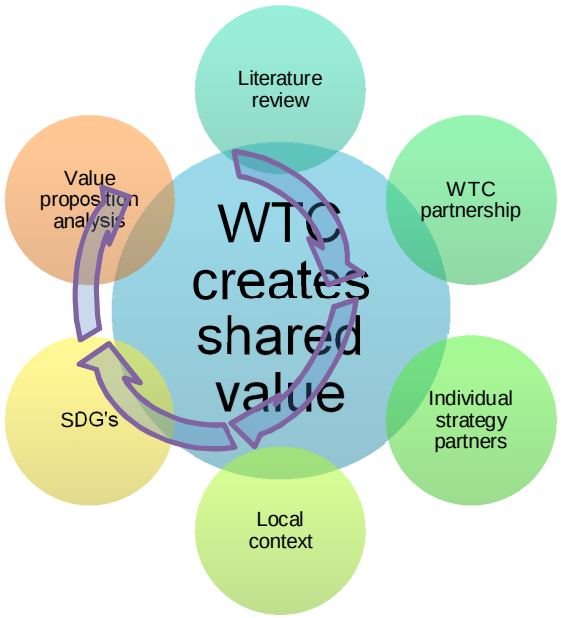
This final chapter includes the conclusion of the findings from this thesis and answers the sub research questions and the main research question: ***How can the measurement and use of social impact strengthen the core activities of the WTC partnership?*** Recommendations for further research are given in chapter 11.2.

11.1. Conclusion

In this explorative case study, performed under assignment of AkzoNobel, the Sustainable Development Goals (SDG's)[36] are chosen to investigate the practical use for social impact measurement of a new innovative waste to chemicals (WTC) partnership in Rotterdam, The Netherlands.

Measuring the economic performance of a company is not sufficient to control a company as can be seen by environmental incidents and social and economic incidents which occurred because of naïve and or amoral behavior. Compared to the economic and environmental measurements and metrics, social impact measurements are still in a developing phase. Implementing the use of social metrics is strategically important for AkzoNobel. By using social impact, AkzoNobel can sustain their competitive advantage and also help to preserve and improve the way we work and live. Figure 22 presents the holistic model of this thesis.

Figure 22: Holistic model of this thesis.



[36] https://sustainabledevelopment.un.org, consulted on 4 February, 2017

The holistic perspective that has been used enriched the outcomes of this research. The literature has given direction and insight of the concepts as well as positive and negative scientific results of the topics of research. A broad investigation has been done as not only value but also partnerships, social impact and social impact measurements had to be understood. The interviews and data obtained from the WTC project has given a more detailed and specific understanding of the individual partners and the WTC project as a whole. The strategy of the partners and the WTC project are an important part to get buy in from each partner when selecting social goals. Using the strategy and by investigating the local circumstances near the WTC plant, relevant and acceptable social impact goals could be selected using the SDG's as basis. The selected SDG's should also add value to the value proposition of the WTC project as this will complete the business model. Three selected SDG's indicators are used to show which social impact valuation method is suitable for the WTC partnership and AkzoNobel. A strength and weakness overview has also been given per valuation method to show potential pitfalls of the method. Finally, a value proposition analysis is made by comparing the value proposition with and without the selected SDG's.

The previous mentioned research method has answered the following research sub-questions:

1. **What is value?**

Creating shared value becomes difficult when the definition of value has not been clearly understood yet. Literature has various explanations for value and most often research uses the term value from the context of the researched subject and the discipline that describes it. The book 'Innovation Design' by Den Ouden (2012) is focused on how innovations can foresee in the necessary transformation by determining the different levels of value which the new innovation is addressing. Economic value means profit in an organization and stability for an ecosystem (partnership) but for psychology these are core values for organizations and shared drivers for an ecosystem. The book gives an elaborate review on value from an economic, psychological, sociological and ecological perspective. The different levels and perspectives together create a holistic view which is useful to look at innovations on how they create value and on what level of society it is focused. A meaningful innovation in an ecosystem (similar to partnership and network) would propose the creation of ecosystems that can adapt to inherent changes and dynamics over a longer period of time and keep providing value for all stakeholders.

The summit of shared value creation is to create a so called meaningful innovation which adds shared value to all levels in all 16 segments of the value framework (Ibid). The aim within this thesis was to simultaneously address economic, psychological, and ecological value by the addition of social impact. The shared value creation will improve quality of life for society and care for people and planet, create lasting value for stakeholders, provide an opportunity for sustainable value for organizations and create a pleasurable behavior changing experience for individuals. In chapter 10 the shared value proposition for the WTC partnership is elaborated.

2. **What is the strategic relevance of measuring social impact for AkzoNobel?**

AkzoNobel believes that when it will contribute to the SDG's, the current business model will be strengthened. With innovation as driver for new products and business models, AkzoNobel can tap

into new revenues, lower environmental footprint and add value to society. Literature has not undoubtedly confirmed this and because of the complexity of business management and sustainability this is also hard to validate. Klassen and McLaughlin (1996) found that environmental performance was rewarded in the marketplace and devaluation was seen when companies came into environmental crisis. In another study Klassen found significant improved manufacturing performance when environmental technology was used to prevent pollution (Klassen and Whybark, 1999). Next to doing good for society this indicates that it is also an efficient, risk mitigating business strategy.

Sustainability in the broadest sense can differentiate business but the company's sustainable business concept has to be aligned to create a competitive advantage. The WTC partnership has various sustainable aspects but it is not yet complete because social impact is missing from the strategy. Kurucz et al. (2008) categorizes the business case of sustainability in four similar arguments: reducing costs and risks, strengthening legitimacy and reputation, building competitive advantage and creating win-win situations through synergistic value creation. To make sustainability work an alignment is needed with the core capabilities and has to be integrated throughout the organization (Yuan et al., 2011; Van Tulder et al. 2014). Amongst others: Purchasing, HRM, Finance, R&D, Supply chain management, Portfolio design, Business models, Leadership and Alliance management can all be shaped towards a sustainability strategy by using business research. Germany's TeamBank is a good example how a bank has become a profitable role model for fair dealing by building fairness into the entire business model (Loch et al. 2012). The Teambank transformed from a conventional bank (Norisbank) and made its strategy work by embedding fairness into their entire value system such as in processes, innovation and the culture of the organization.

By establishing social impact goals and indicators, the current business model of AkzoNobel and the WTC partnership will be strengthened. Whereas the company's economics and environmental impact are measurable and benchmarking is possible, social impact is still in its infancy. Social impact is a critical sustainability pillar according to Elkington's triple bottom line (1998, 2004). The balance between economic, environmental and social goals will not only improve the long term economic performance of a company and its supply chains but also foresee in sustaining the well-being of the people and the planet. The challenge is to simultaneously add value to these three pillars when doing business so that stakeholder value maximization can be achieved. Social impact measurements are needed to see where a positive or negative value is created and where intervention is needed by management.

3. What is social impact?

According to Aristotle (384 B.C.), humans have the capability of 'logos', rationality in thought and language. Humans are capable of expressing themselves in language to give judgement about benefits or loss, about what is just or what is wrong. After Aristotle, thousands of years have passed and this simple of human nature by Aristotle still perfectly explains the essence of humanity and social life. We are capable of expressing and judging of what is wrong or good in our community and need social life to prosper and make our lives enjoyable. In present times, the

international association of impact assessment (IAIA) has an elaborate definition of social impact assessment:

'Social impact assessment includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions' (Vanclay, 2003).

This definition of social impact assessment not only addresses social impact assessment but also underlines the possibility of measuring and managing social impact by predicting the outcome of a certain planned intervention. It is important to note that social impact is not based on activities and output of organizations but on the actual effects on society as a result of efforts or activities undertaken by organizations (Maas, 2009).

When social impact is studied from a higher perspective, the ultimate social impact measurement is the measurement of happiness or well-being. Well-being interprets the quality of life in society and happiness is the state of life of a single person. Aristotle reasoned that happiness is the ultimate goal of humanity as there is no other goal greater than happiness. People want to be rich or famous to become happy, but people do not want to be happy to achieve something else. No other personal goal logically stands above the pursuit of happiness (Aristotle, by Hupperts & Poortman, 2015). Emeritus Professor Ruut Veenhoven has studied and measured the subjective well-being of people and has built a database[37] with evidence based research on happiness.

Happiness or well-being is measurable and scholars throughout the world are performing research to see what affects well-being and how it can be improved (Veenhoven[38]).

According to Veenhoven (2000), happiness including the length of one's life is the best summary indicator to measure the four different qualities of life; livability of the environment, life-ability of the person, utility of life for the environment and appreciation of life by the person.

4. Which social metrics are currently measured by AkzoNobel and the partners within the WTC project?

During the interviews it became clear that the concept of social impact measurement is still in its infancy for all partners. Because of this more focus has been given to establish individual partner's strategic goals from which the social metrics could be selected. The WTC partnership has not specified the social aspects in great detail rather than increasing direct and indirect jobs during construction and operation of the new plant. The social focus is currently on the alignment of the partnership towards the common goal of creating an acceptable business case. Eventually a knowledge cluster with R&D facility is envisioned where researchers and scientist create

37 Veenhoven, R., World Database of Happiness, Erasmus University Rotterdam, The Netherlands Assessed on (June 18, 2017) at: http://worlddatabaseofhappiness.eur.nl.
38 Interviewed at the Erasmus Happiness Economics Research Organization (EHERO) on March 27, 2017.

additional sustainable innovations directly related to waste or chemicals with universities and regional institutes. The majority of social impact is taken in the economic and environmental goals by ensuring sufficient jobs and so creating a sustainable economy. As the development manager from The City of Rotterdam said:

'*Our biggest social value is to create a sound and sustainable new economy which can profit the next generations'.*

AkzoNobel is the social impact frontrunner within the partnership. The sustainability statements in the annual report (2016) show data and explain which projects have been undertaken and which progress is made. AkzoNobel also started a 3D profit and loss measurement where the impact is monetized on the economy, (employees, suppliers, customers, communities in which it operates, governments and investors) the environment (environment and natural resources) and society (value chain). Numerous metrics in the annual report show how value is created through economics, environmental and in lesser extent, social value. The main financials were also stated in the factsheet where social figures are mainly reported on inputs level. On an impact level, social parameters like Health & Safety incidents, Skills and Capabilities are reported.

5. What are the barriers within the WTC project?

The partnership is a critical element in the creation of shared value. Without the alignment of the partnership and the specific resources available within the individual partners, the selected SDG's are too far from its core business. To achieve this, the partnership should overcome identified barriers which have been divided into four main topics: interdependency, communication, the individual perspective and conflicting interests.

Interdependent

The partners in the WTC project are interdependent and this is needed to realize this innovation but it also creates difficulties. The term interdependence in this thesis indicates that the partners are not dependent or independent from each other. The individual businesses of the partners can operate without the WTC project and their short term survival is not dependent of the WTC project to be created. However, within the project, the WTC project only functions effectively when all actors are healthy and performing according to the goals (short and long term). Interdependency creates the opportunity to move past the core business of a company but it also means that the WTC strategy and operation needs a lot of bargaining before decisions are made. The company's resources were drawn towards the core business of their respectable business when needed. Because of the interdependence the relationships in the partnership need to be managed more elaborate than a conventional supplier customer relationship. Rademakers (1998) suggests forming an intermediate organization as soon as possible in order to shield a large part of the individual partners' organizational challenges.

Communication
Communication and trust are key aspects mentioned during the interviews. With the current eight partners 28[39] relations are needed to communicate within the partnership. Each organization in a network attempts to manage its individual relationships based on limited knowledge and a subjective view of the network. Hakansson et al. (2002) states that no partner has a complete overview needed to know how the network will operate and react. Knowledge is incomplete and therefore the only way to be successful is to learn by doing and to establish a deeper understanding of the different perspectives and needs.

Individual perspective
The individual role of the project leaders within the partnership is another observation during this research which has a close relation to communication. Working for a large company brings in difficulties as not all information and details of programs and projects are known. These information barriers could possibly hinder opportunities of improvement in the partnership which could have been applied because of mutual interests and knowledge. Cohen and Levinthal (1990) researched the absorptive capacity of individuals and organization and confirm the barrier of communication and knowledge transfer. The absorptive capacity is the capacity to obtain new valuable knowledge, assimilate it and apply it to create new innovative capabilities. The project leaders in the WTC project are, what Cohen and Levinthal call, gatekeepers of information to and from their organization. According to Cohen and Levinthal (Ibid) the absorptive capacity depends on the individuals who stand at the interface of the organization and the external environment or at the interface between subunits within the organization. Taking care of the right project leaders with a large knowledge base and good communication skills is an important feature of a partnership.

Conflicting Interests
Also the roles and incentives from the other parties are sometimes difficult as the WTC innovation disrupts current businesses and established contracts. The City of Rotterdam for example has a long term contract with AVR to incinerate the waste from the city until 2030. This prevents waste from Rotterdam to be used for the WTC project. The waste will be imported from other parts of The Netherlands, Belgium and even England or from neighboring cities if possible. With this conflicting interest in place, less practical incentive remains for Rotterdam to contribute to the partnership other than the bold vision of transforming the harbor towards a sustainable economy, the added jobs and taxes. AVR the counterpart in this relationship benefits from the long term contract and will see a part of their business shift towards the preferred chemical recycling. For AVR the WTC project is an unavoidable but disruptive innovation which will have influence on their current business model and possible future earnings. Another conflict is the goal to minimize environmental impact and the need for sufficient waste to run the process. The needed waste has to come from as far as England and will create more environmental impact than when it is collected

[39] Formula from Rademakers, 1998, (n*(n-1)/2 = relations)

from nearby the WTC plant. Renewi and WTC partners acknowledge this and are searching for other waste streams from adjacent municipalities and villages.

6. Which social impact is needed for the location of the new WTC plant?

To create a good perspective about the issues that are material for the area where the new WTC project will be build, research has been done using existing databases.

The Organization for Economic Co-operation and Development (OECD), the SDG Index and Dashboards Global Report and the District monitor ('Wijkmonitor') are used to eventually align global goals, local goals and the social impact of the new WTC plant. Before use, an examination of the metadata has been done to determine the usefulness and accuracy.

The data sources indicate several areas of attention but not all are suitable to add value from the WTC project. From the used sources; long term employment, air quality, sustainable consumption and the local selected opportunities for improvement in Rozenburg can be taken by the WTC project to influence as these have a small operational, sectoral and geographical distance following Van Zanten (2015).

7. Which SDG's fit the activities of the new WTC plant of the consortium and AkzoNobel?

The WTC partnership will have a positive, negative or neutral effect on society. This assumption combined with the method previously described by Van Zanten (2015) is used to select the appropriate goals and indicators.

A global indicator[40] framework was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and agreed to, as a practical starting point at the 47th session of the UN Statistical Commission held in March 2016. The SDG shortlist (21/230) was composed by selecting the social goals from this framework which can be influenced by the WTC partnership. The shortlist has relevance to the WTC partnership, the individual strategic goals of the partners or local circumstances. Social goals which exclusively need governmental influence were not incorporated as well as environmental goals such as CO_2 savings even though these are relevant for the WTC partnership (out of scope of this thesis). Also goals with a large operational, sectoral or geographical distance are not selected (neutral).

As can be seen in the selected goals (Table 8) the focus of the WTC project should lie on the bigger organizational culture within the new plant. The social goals have been summarized in three areas. This also adds focus as the WTC partnership cannot add value to all SDG's and 230 indicators.

[40] The global indicator list is contained in the Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (E/CN.3/2016/2/Rev.1), Annex IV.

Table 8: Selected SDG's for the WTC partnership from the global indicator framework

	SDG's
Goal 5	**Achieve gender equality and empower all women and girls**
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**
Goal 10	Reduce inequality within and among countries
Goal 11	**Make cities and human settlements inclusive, safe, resilient and sustainable**
Goal 12	Ensure sustainable consumption and production patterns
Goal 14	**Conserve and sustainably use the oceans, seas and marine resources for sustainable development**
Goal 17	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

For the WTC partnership, three areas of added social value are selected to create a competitive societal business model which enhances positive impact and reduces negative impact. The three areas are aligned to SDG's, the core business of the WTC partnership, the strategy of the individual partners and the local necessities of the community in Rotterdam.

1. Improving well-being of the community and employees;
2. Creating an innovative and knowledge driven organization;
3. Mitigation of negative aspects.

8. Which social impact method is suitable to be used?

The SDG's have been chosen as goals and indicators within these areas because of their institutional nature. There are two uses of indicators for AkzoNobel and the WTC partnership; internal and external. External is used for reporting and engaging with stakeholders. Internal are used to follow performance, set targets and improve performance to create a better business. AkzoNobel wants to share the results with the world and stakeholders in their annual report and have hundreds of locations. Without an institutional indicator, the report would be unreadable if all kinds of indicators and measurement units are used that are developed using the necessities of the local communities. The Social Capital Protocol provided the valuation techniques to measure the chosen social impact. Monetization has been selected to make communication of the results possible towards a bigger public as this as well has institutional value. For each of the three areas (improving well-being of the community and employees; creating an innovative and knowledge driven organization; mitigation of negative aspects.) one example of an indicator has been elaborated to show how the method is used in practice using the valuation technique and the PEM framework. Using this model, Individual performance, organizational performance, partnership performance and society effects can be analyzed and corrected during the partnership project using four impact loops (Van Tulder et al. 2016).

The following main research question has been answered by this research:

How can the measurement and use of social impact strengthen the core activities of the WTC partnership?

This thesis shows that the addition of value creation through social impact, the value proposition which is currently envisioned by the WTC partnership will be improved. Shared value will be created through partnerships and social impact measurement and will create a bold new societal business model where business and sustainability are entwined.

The societal business case is the summit of sustainability according to Van Tulder and Van der Zwart (2006). New sustainable value creation and innovation is introducing new business models to foresee in the needs of the world by forming partnerships and system transitions.
The WTC partnership is well developed to achieve this level when social impact is incorporated as is shown in this thesis. Creating the value proposition as is shown in chapter 10 will create a partnership which does not only recycle waste to chemicals but will provide the full spectrum that sustainability has to offer.

A bold strategy is needed to not get 'stuck in the middle' and a clear and open organization will be recognizable for the public. Such a bold strategy will also make the partnership more resilient in times of crisis Van Tulder et al. (2014).

For the WTC partnership the following recommendations are advised but are not exhaustive as creativity and entrepreneurship are needed to create a sustainable business model which is unmatched in industry. A key element is the partnership itself. Without the partnership the core business of the individual partners are too far from the societal goals. The WTC partnership has to rely on the competences of the individual partners to be able to make this proposed business model work.

Improving well-being of the community and employees

1. The community of Rozenburg is having difficulty connecting with The City of Rotterdam. The waste to chemicals partnership can bridge this gap by involving the people in Rozenburg with the project. Education for children and knowledge sharing for adults are examples how this can be done. The province of South Holland, the Port of Rotterdam, Renewi and The City of Rotterdam have stated these types of goals in their strategy.
2. People with a larger distance to employment need to be involved. This is one of the SDG's (8) and The City of Rotterdam has a program in place to further develop this goal for the WTC partnership. Also the interviews learned that Renewi has experience in how to do this.

Creating an innovative and knowledge driven organization

3. Create an open and innovative culture for the WTC plant to be able to facilitate the involvement of for example disabled people and the local community. Also the employees should be open for innovation and change to be able to assist the researchers during their experiments. The core values of the new company and employees should be developed before the start of hiring people.
4. From the literature study the measurement of happiness is advised for all employees. The measurement of happiness will give the most complete view of the circumstances in the plant. AkzoNobel has an elaborate Gallop questionnaire in place, however this uses ambiguous questions such as: do you have a best friend in the working place? Not every culture will relate to this. Happiness has an institutional value which is largely the same in the world.
5. The plans of a new research and development center are an excellent addition of the current value proposition as they contribute to several SDG's and goals of The Province of South Holland, Port of Rotterdam and the SDG's. The research center should be in close cooperation with local universities and institutes but also with the plant to aid in the optimization and expansion of the process. For example research can be done to process waste streams from customers of Air Liquide or AkzoNobel so the business model can lock-in the customers. Locking-in customers is a way to keep customers by linking more part of the businesses together. This makes it harder for a customer to switch to a competitor according to Amit & Zott (2012).

Mitigation of negative aspects

6. Even though the Enerkem technology is groundbreaking and has the potential to improve the way we handle our waste it also has negative side effects. Acknowledging these side effects and actively taking steps in lowering the negatives is an important part of a sustainable partnership. The research and development center can possibly aid in finding a solution together with the WTC partners, nearby universities and start-ups. The SDG's as well as the Province of South Holland have goals in place to create a (more) healthy and safe(r) living environment.
7. Pay extra attention to lower stench and noise as this is a negative issue for the people in Rozenburg. Even though the environmental permit will foresee in this, extra caution has to be taken during the design phase of the WTC plant.

Adding these societal goals which fit the SDG's will create a bold business model which not only has a clear focus visible from the outside but also takes care of the triple bottom line. The WTC partnership can cover all perspectives of value to a larger or lesser extent. The WTC partnership has all the knowledge in place to create a meaningful innovation which can be the start of a transition of our current industry and economy.

11.2. Recommendations for further research

This thesis gives a broad understanding of the practical integration of social impact measurements within a multinational company and in the complex partnership in the Netherlands. The case study was chosen as best way to research this specific subject as it will give in depth knowledge of the studied organization and particular phenomenon (Van Tulder, 2013). The WTC partnership project and the search for a method on social impact for AkzoNobel have not been researched extensively before. Therefore, this research is governed by how social impact measurements within a partnership could work and is more complex than when investigating the same topic for an individual partner.

From the perspective of the WTC partnership, the WTC value proposition and suggested SDG's have been made by focusing on social impact. The economic and environmental impacts should also be elaborated by the partnership to create a complete SDG goal and indicator framework. Also, the direct impact the new WTC plant will make in practice should be investigated by surveys and interviews to ensure that correct assumptions were made in this theoretical thesis. From a sociological perspective more research should be done to determine the impact of some of the SDG's and indicators which will be used. This should also be made more transparent and should be validated and peer reviewed. Currently the SDG indicators are still primarily focused on output and not impact.

From the perspective of AkzoNobel, more in-depth research is needed to determine the impact of all products. LCA's, toxicologists and researchers are already valuable resources of AkzoNobel to aid in the search of the neutral, negative and positive aspects of the product portfolio. Furthermore, this thesis has been made in a developed country and cannot be copied into an underdeveloped country because of various reasons. For example, fewer data is available on the living standards in underdeveloped countries which will make the research more troublesome.

Happiness is used throughout the world as is explained in chapter 5.4. Happiness surveys offer the possibility to compare well-being results on a global scale. It is advised to investigate the use of happiness within AkzoNobel as it is easily measurable as well as validated through extensive research. Happiness measurements however cannot be incorporated without researching positive and negative impacts. Also, the correct method has to be applied to implement happiness measurements on a large scale within a company.

From a business management perspective, future research could combine the various business disciplines in business management into one multi-faceted sustainable business model. The various disciplines in operations management, human relations management, marketing and finance have their own theories and areas of focus and can enhance each other. A combination which connects these theories together into a sustainable business model could create a broader understanding of the details herein and could reach the summit of business management.

Appendix A: Selection of relevant SDG indicators for social impact and WTC project

			SDG's	Indicators	Explanation
Goal 5			**Achieve gender equality and empower all women and girls**		
5	**1**	**1**	End all forms of discrimination against all women and girls everywhere	Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex	Standard within AkzoNobel
5	**5**	**2**	Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	Proportion of women in managerial positions	Standard within AkzoNobel
Goal 8			**Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**		
8	**2**	**1**	Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors	Annual growth rate of real GDP per employed person	The new envisioned knowledge cluster with R&D will add value to this indicator
8	**3**	**1**	Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	Proportion of informal employment in non-agriculture employment, by sex	The new envisioned knowledge cluster with R&D could add value to this indicator by letting start-ups work together with the partnership
8	**5**	**1**	By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	- Average hourly earnings of female and male employees, by occupation, age and persons with disabilities. - Unemployment rate, by sex, age and persons with disabilities	Value could be added by targeting less fortunate in society to work in WTC plant. City of Rotterdam has got project in place to foresee in this.
8	**5**	**2**	Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status	Standard within several partners. AkzoNobel has high level of accounting and reporting of safety
8	**6**	**1**	Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	- Manufacturing value added as a proportion of GDP and per capita - Manufacturing employment as a proportion of total employment	Highly relevant for Province and City of Rotterdam. WTC technology creates more sustainable recycling than combustion
8	**8**	**1**	Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development	- Research and development expenditure as a proportion of GDP - Researchers (in full-time equivalent) per million inhabitants	The new envisioned knowledge cluster with R&D should add value to this indicator

			spending		
Goal 9.			**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**		
9	**2**	**1**	Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	- Manufacturing value added as a proportion of GDP and per capita - Manufacturing employment as a proportion of total employment	Similar as 8.6.1
9	**2**	**2**	Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	Proportion of medium and high-tech industry value added in total value added	The new envisioned knowledge cluster with R&D should add value to this indicator
9	**4**	**1**	By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	CO2 emission per unit of value added	Highly relevant when cooperation is sought with clients for WTC products by taking waste from clients and create a circular cluster
9	**5**	**1**	Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	- Research and development expenditure as a proportion of GDP - Researchers (in full-time equivalent) per million inhabitants	Similar as 8.8.1
Goal 10			**Reduce inequality within and among countries**		
10	**1**	**1**	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population	In combination with 8.5.1 when less fortunate are targeted to work in WTC
10	**2**	**1**	By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities	In combination with 8.5.1 when less fortunate are targeted to work in WTC
Goal 11			**Make cities and human settlements inclusive, safe, resilient and sustainable**		
11	**6**	**1**	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	- Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities. - Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	Highly relevant for WTC project and location as fine matter concentration is too high in The Netherlands. Specific attention is needed to lower fine matter further than regulation currently allows.

Goal 12			**Ensure sustainable consumption and production patterns**		
12	**2**	**1**	By 2030, achieve the sustainable management and efficient use of natural resources	- Material footprint, material footprint per capita, and material footprint per GDP - Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	Value could be added by education of children and local inhabitants by WTC partnership in cooperation with government and nearby cities and villages.
12	**5**	**1**	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	National recycling rate, tons of material recycled	Similar as 12.2.1
12	**6**	**1**	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	Number of companies publishing sustainability reports	Standard for several partners. WTC partnership could create its own report
12	**8**	**1**	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	Similar as 12.2.1
Goal 14			**Conserve and sustainably use the oceans, seas and marine resources for sustainable development**		
14	**1**	**1**	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	Index of coastal eutrophication and floating plastic debris density	Highly relevant for WTC project. Transport and handling of waste will create the possibility of marine pollution.
Goal 17			**Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development**		
17	**6**	**1**	Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	Number of science and/or technology cooperation agreements and programs between countries, by type of cooperation	The new envisioned knowledge cluster with R&D should add value to this indicator

Appendix B: WTC partners

The WTC consortium is composed out of 11 partners who all have different back grounds. To understand the context of this partnership some information of each company is given.

AkzoNobel
AkzoNobel is one of the biggest paints and coatings companies in the world. Next to this they also produce salt and chemicals. The company operates on a global scale, has around 45.000 employees and is organized in three businesses, Decorative Paints, Performance Coatings and Specialty Chemicals. The WTC plant is an initiative of the specialty chemicals business which has the following 5 main business operations: Ethylene and Sulfur Derivatives: Produces and supplies a variety of specialty chemicals to the building and construction, transportation, consumer goods and industrial segments. Industrial Chemicals: Produces salt, chlorine and caustic which are used as raw materials to make PVC, MDI and other chemicals and materials. Polymer Chemistry: Supplies organic peroxides, reactor additives, organometallics and polymer additives. Pulp and Performance Chemicals: Supplies industries with chemicals for the paper industry. Surface Chemistry: Produces surface-active agents that are used in everything from asphalt and agro chemicals to paint and personal care products.

When writing this thesis AkzoNobel is fighting off competitor PPG in a hostile takeover. AkzoNobel does not want to be incorporated in the PPG business as fundamental core values and business philosophy differ as PPG does not pursue the same sustainable path as Ton Buchner, company CEO says (www.fd.nl/ondernemen/1191504/bod-levert-gevaar-en-nadeel-op-inzet-akzonobel-op-duurzaamheid?). In reaction to the unsolicited proposal from PPG, AkzoNobel fastened the pace towards separation of the paints, coatings and chemical business by separating the Specialty Chemicals business within one year.

Six data sources are used to profile AkzoNobel, a recently made factsheet for the specialty chemicals business, the AkzoNobel annual report from 2016, the AkzoNobel website, an interview with the project leader from AkzoNobel for the WTC project and an interview with the social impact manager, the director planet possible and with the corporate director sustainability.

The factsheet provided on the website of AkzoNobel shows the main information of the specialty chemicals business (www.akzonobel.com/about-us/how-we-are-organized/specialty-chemicals, April 2017). In 2016, the Specialty Chemicals business needed 9% less CO_2 (Improvement CO_2 (e) per ton of sales from 2012 cradle-to-grave carbon footprint). 19% of revenue is made out of so called eco-premium solutions which target more environmental chemical substitutes than commonly used chemicals. The fact sheet furthermore shows that 100 million euro per year is invested in R&D and that more than 5000 patents are obtained. Furthermore the standard financial targets are important such as ROI and revenue and EBIT.

Enerkem

The first Canadian commercial plant was created after the eminent closing of a landfill garbage site in Edmonton. The facility in Canada is made with partnerships with the Government of Canada, a company from the government Waste Management, an alcohol company called Green Field and several local capital investment agencies. The municipality started looking for other alternatives for a landfill as the closest landfill was quite far from the old. This meant that transportation costs would go up as well as the emitted CO_2. 200 alternatives for garbage disposal were investigated by the municipality and the Enerkem technology was selected as it showed the highest potential. The state of Alberta also came in as they saw the potential of this technology. Alberta is seeing a loss of jobs because of the declining oil industry and downturn in oil wells and wants to diversify the industry and get away from oil to ensure future jobs and a vital economy in Canada. Another important target is to reduce GHG (Director Government affairs, May 2017).

Two data sources are used to profile Enerkem. Enerkem is not listed on the stock exchange and information cannot be readily obtained from an annual report so use is made of their website and an interview with the director government affairs of Enerkem.

Enerkem is a relatively young Canadian company started in the year 2000 by hiring the first employee next to founder Professor Esteban Chornet (Université de Sherbrooke, Quebec, Canada) and his son and CEO/President Vincent Chornet. Currently, Enerkem has around 200 employees in Alberta and Quebec and is headquartered in Montreal, Canada. From here, they provide the technology needed to convert non-recyclable municipal solid waste (i.e. garbage) to valuable feed material for fuels and chemicals. Enerkem currently has around 15 research and development projects, run from two facilities dedicated to innovation in Sherbrooke (Quebec) and Edmonton (Alberta), which are currently funded for around $12 million dollars.

Port of Rotterdam

Three data sources are used to profile the Port of Rotterdam, a strategic progress report from 2016, the Port of Rotterdam website (www.portofrotterdam.nl, May 2017) and an interview with a business manager of the Port of Rotterdam.

Rotterdam has the biggest harbor of Europe and around 175.000 people work here for a variety of companies. The Port of Rotterdam is a government owned private party which owns the harbor and exploits it for commercial use. The company is run without direct government influence but the stocks are owned for one third by the Government of The Netherlands and two thirds by the municipality of Rotterdam. The port's classic business model is to exploit the harbor by leasing land to companies like AkzoNobel and Shell and by charging harbor fees to the ships coming into the harbor. The Port of Rotterdam also has a public task, to guide ships safely through the harbor, more or less just like the flight tower at an airport. The generated income from the classic business model is used to strengthen the harbor and make it sustainable for the future. Rotterdam's petrochemical cluster is heavily dependent on fossil fuels (mainly crude oil and natural gas) and their continued supply. As the cluster is quite inflexible in its dependency of fossil fuels as feedstock, issues related to public and private agendas in relation to a drive to decrease this

dependency of fossil fuels (e.g. the RNE agenda and its strategic issues such as availability risk of fossil fuels, GHG, E transition) will inevitably have a strong medium to long-term impact on current chemical industrial complex.

City of Rotterdam

Five data sources are used to profile The City of Rotterdam, a strategic report of Rotterdam[41], a strategic report of the metropole Rotterdam-The Hague[42] and interviews with the project leader of WTC and with the Development manager clean technology, City of Rotterdam.

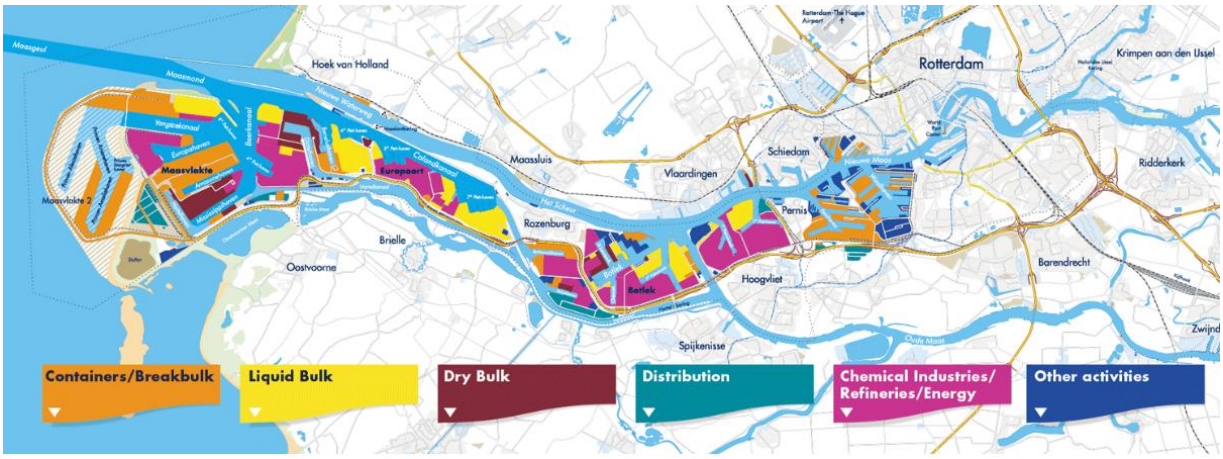
The new WTC plant will be built in Rotterdam, The Netherlands. The Netherlands is seen as a very wealthy and densely populated country in Europe with around 17 million people who live in an area of 41,528 km² (18.41% water). 488 people per km^2 as an average, but the majority live in the Randstad (Rotterdam, Utrecht, Den Haag and Amsterdam). The Province of South Holland lies in the west of the Netherlands and on the coast of the North Sea. It is the most populated area in Europe with more than 1000 people per km^2. The biggest city of the province is Rotterdam and has the largest port in Europe which is used for industrial activities and cargo transport to provide a large part of Europe with the needed necessities which are imported from the rest of the world[43].

Figure 23: Partial map of The Netherlands including the Province of South Holland and city of Rotterdam44

[41] www.resilientrotterdam.nl/wp-content/uploads/2016/05/strategy-resilient-rotterdam.pdf)
[42] (www.mrdh.nl/sites/mrdh.nl/files/files/The-Third-Industrial-Revolution-Final-Report-RNE.pdf)
[43] www.indexmundi.com, assessed in May, 2017.
[44] Source: www.britannica.com

Rotterdam is the second largest city of The Netherlands and home of the biggest port in Europe including the largest industrial area of The Netherlands. In the Second World War, Rotterdam was destroyed and after the war Rotterdam was re-built which is shown by the modern architecture and rural spacing. Around 630.000 people from 170 nationalities live in Rotterdam and the city has one of the most open economies in the world[45] The City of Rotterdam employs around 11.000 civil servants and Below the bigger area of Rotterdam including indication of industrial activities (source: www.portofrotterdam.com). The natural delta towards the North Sea created an ideal situation for the harbor and now Rotterdam is providing a large part of Europe with goods from all over the world.

Figure 24: Bigger Area of Rotterdam



Province of South Holland

Three data sources are used to profile the Province of South Holland, an essay about the social impact of technological developments (2016), the website of the province South Holland (http://2017.begrotingzuidholland.nl, may 2017) and an interview with three people of the Province of South Holland: the project leader WTC (economic affairs), the project leader Green Circles (public private partnerships) and the transition campus project leader (economic affairs).

As a governmental organization, the province of South Holland has several tasks. Their mission is ensuring that South Holland is sustainable and balanced, taking advantage of our position, knowledge and network, so that society, travel, living and recreation in South Holland is optimized (www.zuid-holland.nl/overons/missie-visie). An impression of the province itself is given in chapter 8.

[45] (www. www.resilientrotterdam.nl/wp-content/uploads/2016/05/strategy-resilient-rotterdam.pdf).

Renewi

Two data sources are used to profile Renewi, the website of Renewi (http://www.renewi.com/en, may 2017) and an interview with the project leader WTC (business development).

The companies Van Ganzewinkel and Shanks were recently merged to form Renewi, now a waste recycling company with around 8000 people divided over Europe and Amerika. Renewi has four divisions; Commercial, hazardous, municipal and mono-streams.
The two most relevant divisions are; The commercial waste market and covers the collection, sorting, treatment and ultimate disposal of waste materials from a range of sources. And the municipal waste division operates waste treatment facilities for UK and Canadian city and county councils under long-term contracts. Such contracts are established primarily to divert waste from landfill in a cost-effective and sustainable way (www.renewi.com, May 2017).

Appendix C: Transcribed Interviews

The interviews are chronologically ordered.

Ruut Veenhoven, Emeritus Professor, Happiness economics, Erasmus University

Martijn: If we talk about happiness in the world, are we looking at different things? Eudaimonia of Aristotle opened my eyes a little to what happiness is and that there are different perspectives. Can we assume that everyone has the same understanding of happiness?
Ruut: Happiness I take up as a lifetime achievement. Happiness is exactly the same as in China as in the Netherlands just as a headache. The differences in cultures are there in how important they find it. Usually, if you're not so happy, you're inclined to say happiness is not that important. There is also a difference in what people think makes happiness. There is a little difference in conditions which make happiness. In China, your happiness is more dependent on your mother in law than in the Netherlands. Conditions that determine happiness are very similar. The cultural differences in determinants of happiness are very small. All people who are happy need health, social contact, and pleasant activities.

Martijn: Is the Maslow pyramid involved?
Ruut: Then you go deeper. Happiness depends very much on the satisfaction of the human need and that is well taken in the Maslow pyramid. Those are very universal. Happiness is measurable and therefore I also have a world database or happiness.
Ruut: All countries of the world research. Two ways are measured, how did you feel yesterday? And asking for satisfaction, actually asking, do you have what you want? In my view, life satisfaction is what I call happiness, yes, it's both a matter of how you feel like a matter of how you compare. Feel more than compare. You can feel satisfied and still feel awful (princess depressed in the golden palace) and you can feel good and not have everything you want. If you ask people, are you happy? Are you satisfied in your life? If you ask little children then they say how they feel. If you ask an adult they say, I have it, do I have a nice job? But also in adults, the feeling dominates.
Martijn: Do you have to think carefully about the question of happiness to get a good answer?
Ruut: Yes, the best way to ask is first: how are you this moment, then you take away the parking ticket. And then you ask how do you look at your life lately?
Martijn: Aristotle then indicates that you look back on life and determine if you were happy.
Ruut: There is 1 difference between Aristotle and my vision, he is looking at the whole life. There you can see if life has worked out for you. Now take Adolf Hitler; If you had asked him on his deathbed how was life he would not have answered positively. He shot his head but if you had asked the same question two years earlier, the answer would be quite different, and said; that's fine. Happiness what you think of life at the moment and this is determined by a whole lot of things and it may happen that the end life gets a tragic turn. Aristotle's view is that happiness is often good life. My focus is more of what does it feel like at this moment and how much satisfaction does it give? That does not mean that you have a morally good life. Some bullies will say they are very happy, just had a nice fight! Thus, the Aristotle definition of happiness used in

philosophy is often with a moral judgment. While there is no moral judgment in life satisfaction, bad people can in principle be happy
Martijn: Aristotle may say that with a bad life you can never last forever to be happy. Bad people are then punished by society?
Ruut: Yes, but not always, there are a lot of thugs who have a very bad life but are happy.
Martijn: Can we assume the same happiness as in China?
Ruut: They may find it less important. Chinese can think more of luck is determined by fate.
Martijn: Are there any other ways to measure happiness?
You can ask, You can ask if they like it, You can use smileys, Or clock how many times harry is crying. You can use face recognition, and there are devices that can do that. Recognition works at a short distance with a camera. Another way is the happiness diary. Have you ever seen the happiness clock? Www.gelukswijzer.nl. There is also a happiness diary and that takes a little more work. If you want to know how much fun people have on the business? There is a bit of a tendency to focus on how people experience their work. Job satisfaction and not life satisfaction are asked. This is logical because the boss is about your work and not about your life. But what is interesting to know is that life satisfaction can predict your productivity better than the work satisfaction. Some people are not so happy at home but more at work, special people. Some people are quite happy at work but much more satisfied at home.
By the way, this is part of the economic faculty and is an institute focused on happiness economics. Global research into happiness.
Martijn: Are there any disadvantages to measuring happiness? Yes, people who are very unhappy are remembered again that they aren't happy. And some people say that happiness is not the most important thing. For religious people, faith is more important than happiness. It is not God's intention that we are happy here. Socialist can also say, capitalism cannot ensure happiness?
Martijn: Is happiness makeable?
Ruut: Yes to some extent. Happiness is about as makeable as health. Little bit less than health, health has a big genetic factor like in health and the other part is determined by the circumstances. Do not live on a dumpsite, and then you'll get the plague. You'll see that in twins research. But I think happiness depends a little more on your way of life than on health. If you are born with a lump on your back and a hollow foot, there will be a point less or when your relatives are depressed.
Martijn: Are there any prejudices around happiness?
Ruut: Many people think it's very vague and that you uphold an ideology. That it is impossible to investigate. It is scientifically measurable.
Martijn: Are there any companies that measure happiness?
Ruut: Not so much, they all measure job satisfaction. It does happen with coaching just outside the business. Companies in health care and especially in education, it is well known that people who are happy are better at work. It looks like happiness, but there is always doubt that you cannot get involved in private situations of people. That is a limitation. One of the ways to solve that is to say you say, I'm not the one who's involved in your happiness, but I think it's important that you're happy and I give you the means to get happier. Life-coach is a remedy via the company doctor, psychologist if something is wrong. Often for higher functions a life coach is used to see what one wants.

Martijn: Is it wise to measure happiness for a company?
Ruut: Yes for two reasons: 1, because it is a production factor, especially in terms of job sociability and creativity. But for some professions it is not necessary (bookkeeper). If you are happy, you can place yourself more easily into others and expand your perception and also better invent new things. Being unhappy, will narrow your perception, so being happy opens the shutters and so you come up with new ideas. Overall it's a good thing to be happy, they are less sick, less quarreling, so for business and family. This also depends on industry due to interaction with customers and patients. In none of the industries, it is standard that happiness is measured. At the moment, the majority is still happening in healthcare. The awareness is urgent and that is more obvious than at akzo. In an elderly home you can measure how bad or how good the people are. In principle, you can compare between homes how they do it. That is an ongoing development. The nursing homes are already evaluated on a few quality issues, but that is the number of m2 and complaints family or family surveys, but it becomes clearer that isn't all there is, you have to look at grandma's happiness and how long does she live? First look at the result happiness, then look at the m2. This is certainly all new.
For akzo it is quite difficult to see the effect of the paint on society. Employment, paint non toxic etc. I think it's hard for one company to quantify the result of the paint on happiness in society. Maybe you can do that with the environment? Paint is difficult to quantify when you want to measure the success.
Happiness is well measurable, but in a certain context. People in factory are good measure in the immediate area more difficult and effect in the Netherlands is almost impossible.
You can say that paint has a positive effect but it is very difficult to do that exactly. Is it 0.2 or 0.8 point of 10.
Martijn: Is there a generic way to measure happiness? These are there. If you take paint as an example, you cannot say that it has a very big effect on life satisfaction. Too small to be measurable, but I can imagine that the mood is affected by different colors. That could be measured through experience sampling. Then it is also difficult to take notice of the context. The context is very complicated, the Efteling is very nice and beautiful but not everyone wants to stay in the Efteling forever. Then you will also come in the area of the effect in architecture. All architects say they design with respect to happiness. But they can easily say that for now it has never been measured. Now, that could be a good idea, how do you feel now? Measure in one space and then measure in the other space. Measuring can now also improve better. Today's techniques offer the opportunity to measure more often. Experience sampling, you take a sample from the experience. Practically, such an experience sampling is: product level difficult, work simple, environment difficult, suppliers and customers quite easy.
Parts of luck measurements are sometimes difficult. We measure with companies but do not personalize them. We say what the measurements are, for example, 1 point lower than home. That's quite normal by the way, but we do not give details of Mr. Janssen. Well, we say that Mr. Janssen, for example, is slightly lower than the average. Why are you feeling so bad? For example, if you are using your happiness diary, you can see for example that the day before you had 14 beers. The diary can be used to compare yourself to others like you (we have a pool of about 100,000 people). If you have worked out in the morning, you will see a clear effect. Workaholics are also a good example. They have a big advantage when they are exercising in the evening and

you see a the happiness rising the next day. However, other types should not sport at night because they cannot sleep well. Most people bloom in the evening, so they often go to bed too late.
Martijn: What factors are important to happiness?
Ruut: You have to be careful, you are looking for general guidelines, and there are few, but for happiness it's more how find a way of living that fits you. It is customized and it is often also a trial and error effort. You want to be happy, but then you have to know how happy am I. And if you are already happy you will not have to do anything else. It's just like your health, when you score an 8, it's just good, but when you score a score of 6 then you have to think about what to do. For some, try this or that and that is often difficult. The happiness agenda can help with these things to see what made you happy.
Martijn: can be your own coach? Yes, by measuring you can see what you can change. In relationships, for example, you can see how well you thrive. For example, the love life in Ned is quite good because people have often worn a few 'fiancés'. In our pattern of serial monogamy, it's typical that you learn your preferences. You also change yourself and sometimes another woman is better for you. What was a good match at the start does not have to be the same later. Satisfaction is a good feature that sometimes lets you think, I have an 8, I will not look for a 9, that change is quite small.
Where is Akzo's factory going to be placed? Indeed, the world database has researched the degree of pollution and happiness. (Bibliography, happiness and location, literature on polution). For example, regions are taken (ruhr area) where they measure happiness in these areas. The same is the case, for example, at airports for noise. How many money should we add to increase happiness? The annoying thing is that the relationship happiness is quite flat and that it takes an ability to get them as happy as for example in Lutjebroek. That's a piece of environmental research and happiness. It is also really good research. Not just watching what people are thinking but also effecting comparative research with other areas. Or in winter winter spring etc is the pollution stronger? You'll get something out there. If you do contribute to employment and do not contaminate then..
Martijn: Could you consider what brings happiness and decreases happiness to create a happy environment.
Ruut: Yes, that's exactly what we do at Happiness economics. Weighing out certain factors to create the best happiness. In Germany (the best) every year 10000 people are interviewed at the Social Economic Panel. Children from 16 years of age also, when they go home, the research will be increased.

Focus group AkzoNobel and RSM at the Partnership Resource Centre, Erasmus University Rotterdam (EUR)

- Corporate sustainability Director AkzoNobel,
- Professor Rob van Tulder, Academic director of The Partnerships Resource Centre (EUR),
- Partnership researcher from The Partnerships Resource Centre (EUR),
- Social Impact Manager AkzoNobel,
- Director Planet Possible AkzoNobel.

Sustainability Director: income of our suppliers and customers, the taxes and salaries we pay, we found an integrated way to think about negative environmental impact. The negative social impact we say we have a zero tolerance because of human rights impacts, injuries, incidents, you want to think in terms of positive impact, employees, contractors but also in our products. Do our products really avoid malaria in Africa and the processes are we an enabler for change? For me the WTC is one example of a great thought process. If we succeed, we've got the idea from Edmonton Canada, the population said: we do not want another landfill, then the government said that they wanted to build an incinerator, but the population said that they do not want this in beautiful Canada. Then the government installed the Enerkem waste to chemicals plant. We said, if they can build it in Canada why don't we bring it to Europe. We got the city of DZL of RDM province of south Holland, ministry of infrastructure economic affairs, van GAnzewinkel, Sita many companies included and we visited. Now the big story is: I consider this as one of the 12 technologies that we could bring to Europe. In Europe we are afraid of digitalization, immigration, globalization, loss of jobs, automation and here you have just one technology but if we would bring this technology to Europe it would require 18 billion euro investment for Europe, it will generate 50.000 new jobs in Europe and it will recycle 92% of waste in Europe. Would it 350 direct, 150 indirect jobs in the Netherlands. New thinking, social cohesion, confidence in Europe, understanding that Europe does not need to be depressed; we can grow and aquire new industries. Yes we will lose many jobs in finance, in banking, in insurance in robotisation. So many jobs opportunities in Europe to educate people to work together.

Rob van Tulder: It is linked to innovation, because the social theme is framed by a distribution problem. So, we do not want to loose, but actually when you can link this to innovation value creation and not value distribution. The economic part is easy, in reality its about distribution you profit and loss. Economics is business, add value, creating value through innovation, through networking and through combination of products that you developed that are aimed to the needs of people. It's not that you create a product and you try to push it through the value chain as a marketeer. It's based on needs so that's where the SDG's are leading and if you can have an innovation agenda which requires really sophisticated partners, good governments, and together match it. It's not about easy stories, but if you can make that work. The pilot in Canada can be interesting, because I'm guessing that none of the actors there were weak. Sometimes local communities are and in the Netherlands it could be another. It should be a pilot for the kind of approach for the whole company.

Director Planet Possible : If we can measure it in a very good way we can see the value creation for all parties involved we can take it to countries in China and make this a differentiator for why they should go for Akzo rather than PPG. For this first we should make it as tangible as possible because they are all fooled by numbers. The better we can actually demonstrate what partnership we are after, what kind of strengths we need to have in this consortium. This should fit with the strategic intent of growth, where does Akzo need to increase their footprint and where do they need to keep current footprint. Because I think that a combination of it and why we are looking at the prototype in a mature country and in an emerging country to actually see how to define the context in a different way to be sure we all can select the right arguments and the right partnerships.

Rob: If you call it a prototype not only for technological innovation but also for a new way in organizing production within a society. So then we do not only create innovation on recycling waste that would be interesting. I would advise you to do a number of things, one of them is to find indicators. You search for indicators in partnerships itself. You search for how all the actors around the table, how they respond to this. Institutionalization, its not about do you like the partner, it about what do you like about the partner. Figure out what they find important. So how many jobs or whatever. Not within AkzoNobel box.
The master thesis you can figure out by talking to these people, on base of interview protocol, see what they value. Its not about measuring but qualitative research, perception. But not searching for misleading quantaties. The things you want to know is about vision, perception, value creation. The whole network have complementary visions. What kind of value would they like? I already see some gaps by the way in your coalition. That's also part of the research also, who's not there. Then we have a long list of questions PEP initiative website on contex. How important is the Rotterdam contex compared to the Canadian context? Who are the stakeholders, how different are they. But also in terms of dynamics, how to cope with government structures, how can you keep track of progress? Because it will not be a perfect partnership, not at all. There will be people around the table with mixed motives or they might change during the partnership. That makes it so interesting and difficult to develop business models. But basically then it is about ownership, perception, defining value.
Sustainability Director: This whole partnership is established for AN because we want to source biomethanol in the end of the day instead of fossil fuel methanol. Many partners are interested and we are currently in process to get total funding ready and are close now. Once we get it ready to go, but then you still say, why does Rotterdam want to enter, why did south Holland? Circular economy or 500 jobs? Why van Ganzewinkel? Why are parties interested?
Rob: You cannot calculate it. You define it as a technical project with a clear deliverable, you might even define it in circular economy terms but there' s much more to the story as social economics, contex, conditions you will have to define other stakeholders that you did not take into account. They might be the ones that will be the problem in the next fase or then you might want to have them now or involve them. How do they look at the partnership, how do you cover progress, not only that you implement it or have measurable results. But that maybe their perception changes. You basic story is that you would like to scale it, reproduce it and in this process you have to figure out what are the indicators that are really important to understand whether it works or not and or not can be as useful as whether it works. Very often consultants they take best practice case and replicate it and then it will work, but it doesn't and we now that. Often the success of today is the failure of tomorrow so you have to understand what are the timing conditions ect.
You have to go for complexity also, for the partners there's so much more than financial returns but in the issue, there's more than the technical. Not only SDG 13 or not even SDG 8 but check also which SDG come together and on what level. This is extremely difficult and you can study this for the next 10 years. Quick scan technique: define complexity of the problem. You come up with a solution, in recycling but also it's about chemicals and the need you want to serve. Understanding the problems or societal challenges. Wicked problems, but how can you make this problem move to innovation instead of negative frames. In practice this means partnering,

coalition, keeping track of progress by interviewing people, qualitative research (impact team) and advice to establish impact team by the way. Bring in people from outside and should be about learning. Learn from each other and build trust. Do not think that Rotterdam city trust Akzo, if they do they should think twice, not because you don't have good intentions but because they have different interests. But they can be realigned. And if a city official believes you at your word because you have to be careful also from a company perspective as they are naïve, they are not well thought of what is in their interests, they need to develop it for themselves. Institutionalization we call it. If they don't do that they in the next stage they might be a unreliable partner because they do not move on in the project that you want. They are just in there for a subsidy or because they like it or that they would also like to open a plant. The organizational context you create in a complex world, and that great because you make it manageable then. You create a new organizational entity, a management challenge. This what I call portfolio management. If you manage that well, you learn and strive from it, do it bad one way or another it might even work for you but not for your partners and you cannot reproduce it.
Invite you also if you want it to work as a prototype, how it work in your complete portfolio how it work in you general strategy. If your approach to this in this way is great.
Director Planet Possible : Now we are tackling it in a post mortem way and think do I understand this when it happens. Someway along the line you have to have a meeting with all the partners and share dilemmas. As long as the parties around the table are not able or willing to share some of their dilemmas the partnership will fail.
André: It's interesting, we have identified several areas where we would need the same kind of thinking. We have because of our innovation, we have a lot of products which we would like to bring to market but everybody would think that this is only our interest. On a higher level we would like to work with the EU or with EKA or REACH and we, with a few other companies, would like to advance to a big substitution plan to zero harm world.
Rob: Value proposition is the start, what need is being served? Currently in chemical industry focus is on limit waste, seems to be more risk driven and more negative limitation of risk. You cannot be fake or cannot be too concrete, because then you cannot align all sorts of companies around the table. In the USA this would not be accepted as sociatel influence as this is not in the culture. Many people would say its not in your duty. In the USA it's all about making profits and not serving society.
In the Netherlands this will not be a problem. But what is the need serving with this plant, is it only chemicals, or waste recycling of high value chemicals? There is more to the story.
André: I'm working with a conservative group CEFIC. In CEFIC we said, if we think about the SDG and COP21 and the tremendous transition that's needed in Europe. We came up with 4 big categories, green chemistry, circular economy, renewable energy… and with each of these each of these four catogories three technologies, and wTC is just one technology under circular economy. If we would apply this plant in Rotterdam, what would this one technology bring to Europe. And then think about needs, envrinmental, social, economics. How many jobs and invested capital and innovation would bring it to Europe. Europe does not have exes to primary resources. How would it keep materials in the loop and to use molecules twice instead of once. You start with a picture in Europe, in the Netherlands and that picture is based on what impact would it bring on soc, env, econ do we want to generate in a holistic way? Every euro spend, it's should be 100

5 renawable energy, its should create 100 jobs for taxidrivers to become operators and it should become the new innovation model for brasil to grow its economy. How do we align people behind this narrative of shared value and why would very different people interested people to work.
Rob: Focus on area's of attention, they should be related to the value proposition of Akzo. If there's a European agenda and this could be aligned with akzo. Link it conceptually and then there would be a number of indicators which you can develop.
Social Impact manager: Siemens did this and looked at national developments prior to SDG's and looked how they could contribute to the focus areas per country. This has been a big thing within siemens as the people could see the direction.
Rob: Siemens is slightly different as it is a system provider and they have to collaborate to operate with external stakeholders. For akzo this is a bit new, more new than for siemens. But it's a challenge but not all companies do it well.
Social Impact manager: What is a good starting point? The Netherlands, Europe is a bit huge? Rotterdam, Netherlands?
Rob: I would start with CEFIC and check it on dutch contex, Rotterdam, Netherlands. Theoretical research on how Netherlands differ from other countries. Databases are abundant. Siemens uses internal intelligence to what they find important as a company. What is akzo value added. There's a dominant idea within companies, you go for unique selling points and you try to build them up. But you run the risk of closed loop thinking in term you just want to sell products. Also identify were you are weak in terms of new needs, new ideas. That's where your value proposition is an interesting case. It forces you to identify gaps analysis, gaps in terms of the stakeholders, SDG's. We want to do something or that society is going a certain direction and it will be a mayor opportunity. Gaps in terms of portfolio's? This project becomes a prototype or example of a unique selling point of the company.
Director Planet Possible : Well it's the footprint, I don't look at it from the product point of view we will not win and we are at the moment product and sales driven but there' s a limit on how much you can do with pure product innovation. You have to go down value chains or bring in new business models. That why you have to look at it from a strategic point of view, where are we now and where would you want to go and which resources would we need.
Rob: a large part is efficiency driven. The advantage of circular can be that its not efficiency driven but stakeholder driven. That could be a completely different story, it could be innovation driven, need driven. And you will still need efficiency to be a good company. It could be a completely different trade off. this is the gap analysis, this project can contribute to some of our strengths but also contribute to our weaknesses and could be an example for improving and learning.
André: economics are known, environmental is but social impact is still in its infancies. Do you agree Rob? Yes indeed.
Rob: we have had the max havelaar lecture. I like the SDG agenda and the true pricing stuff is very much related to what we can measure and monetize. It's a defence mechanism against the critics but its not enough. My approach here would be to break through this because there's a paradox, a dilemma. We cannot wait for all the information but we can go to all the stakeholders and figure out what their statements are on value, qualitative statements of complementary statements on ambitions, realities.

Example: Colombia, company wanted to own the project, government were there to give some money temporarily and should go away after some time. Ok but after some time the CSO did not liked it this way and backed out, killed the project.
With true pricing you narrow it down on jobs, it's very dangerous. You create new business but you also destroy jobs but in another value chain. If you don't take this into account you are naïve or actually not scientifically sound and that's unfair. So what you do, you bring into account the dilemma's, the trade-offs. You reap the profits in the future, but you'll need to have some losses include in future or exclude people now. Question is too see if this is acceptable with your stakeholders, whether you can link it to a chain model. Leading questions for the impact team, establish an impact team. Then we have impact loops, social, ecological impact. Asking leading questions to participants.
Several levels, individual level (who is participating, what does it do for you?), organization akzo (how does akzo work, how is it integrated, new organization), partnerships in various phases (Canada phase is now build, portfolio, constellation, configuration, fit for purpose, what is the purpose? Coherent purpose to be sustainable). Fourth level is society, the impact level, the ultimate impact. Theory of change want to predict that but this will only be possible later, the real impact even though you have an ambition. 4 levels and completely different questions, are there gaps, or are they aligned? Whether there's a sophisticated theory of change, poor or rich? Poor is easy, I want to be big, lower cost, the first but that's poor value prop. Its instrumental and it does not work.
If all the actors have rich value props then it will be a good partnership. But off course this will not be the case. So you have to identify four phases and identify where you are in the partnership and then everything is more manageable, quantifiable, identifiable and by doing that you can study it and have feedback, learn and improve. That's the only thing we can do at this moment. The one size measure fits all does not exists by the way Context really matters, why would you want to do this as it is really easy to copy and the Chinese can do this. But they cannot as partnering is smart and requires on a political economic level it requires balance societies, empowerment of people, smart models and good partners. Investing it this network will create not only a great innovative network which you can copy also to developing countries. It also helps you against hostile takeovers to two bit business models where they only go for short term profit.
Theory of change, enhancing impact of partnering, general complexity theories of change. Scanning techniques.
You have to be practical but not too practical
André: we want to lead this topic of public private partnerships driving value creation as a concept to help our people to think about how they can engage and think in doing business in a new way, business transition generating value strengthening our business.

Project leader (consultant DHV) City of Rotterdam WTC project

Martijn: Please, describe your organization
Project leader: I'm a little bit cautious because I've just been hired and I'm still finding my way. But, as I understand, there is a client, Alderman Maarten Struijvenberg. He is responsible for this project. He is interested because he sees this project as a key project in innovation, sustainability,

circularity and it fully fits within the ambitions of Rotterdam. They see this project as an showcase project for the future economy on how it should work (roadmap is made). Amongst him, an official team is composed, several officials from different specializations, which are directed by me, the project leader. Team consists of a lawyer, a waste specialist (household waste, can it be used as feedstock, what time, what are the consequences, what does it mean for the taxpayer? Can he get money for his waste? Or do they pay less or less more? The project has a lot of consequences when it will succeed. Coordination with other governments, ZH Province, Cleantech Delta or Rotterdam Partners, Innovation Quarter. This is streamlined by an environmental manager. Depending on the need, other officials are involved. It is not a full time job, scope municipality is not very big compared to technical work. Nevertheless, we have a schedule and things have to be done, the core team's has to deliver in a timely manner.
Martijn: Who are your main partners today (companies, NGO's)?
Project leader: For this project, these are all partners. This was the FAT project (acceleration Economic Transition). Port of Rotterdam, Deltalinks, Innovation Quarter, Clean Delta.
Martijn: Why are you in the WTC project?
Project leader: There are public interests, due to sustainability, waste processing circularity, next economy. Port is changing by automation, robotization, economy is changing. There are a number of trends and how should we move towards it, and then the idea is that the government will play a role as a chain director. A party that brings together public and private parties in initiatives and supports those initiatives. There are a number of preconditions: scalability, demonstrable sustainability aspects, lead to employment, concrete results within the maturity program. This project contributed very well. How are we going to support this? The parties point to development funds, matchmaking, delivery / development now support with team to see how we can facilitate this from existing policies, law and regulation and future vision from the municipality.
Martijn: What are your goals on the long term
Project leader: The goals are still floating, but are now formalized in a bid book. Bidbook is the result of vision formation and questions during the creation of the project. We think of employment, number of direct and indirect jobs. Sustainability aspects, LCA effects implemented, 200 kton CO2 less, in terms of innovation objective to link this project to other initiatives in this cluster. Hope / wish / idea to set up a research center with universities here in region. First of all, this project must be started.
Project leader: The aim is to support FID (Financial Investment Descision) within the municipal role. In order to help the commercial parties to get funding. Region has to show, we support this, the alderman makes this clear during administrative consultation.
Martijn: Please, describe/draw your organization in the WTC project
Martijn: Please describe the role that you and your company play in the project
See earlier.
Martijn: Please describe the goals within your organization
Project leader: Are there any other important goals within the municipality? I find it difficult, vision is on paper, project is a showcase, not surprising that the alderman responsible for employability is backing this project. Context of your research and social benefits are not very good to measure because they are very difficult to determine. Jobs are easy to count, avoided CO2 is also easier but further it will be difficult. Then it comes down to innovation and clustering,

stimulating technology. Because it is difficult to measure, you do not make a goal as quickly as possible. I think there are ideas and feelings from the gut, but we do not push this in this project.
Martijn: Please describe the challenges within your organization
Project leader: Big challenge is planning and information provision. Decisions are taken by the private consortium members on the basis of criteria (financial feasibility), but the criteria are not very well known and when decisions are taken, they will also shift. Therefore, we need constant consultation, what is needed and how can we support, what has changed in terms of partial agreements in bidbook, precise costs, technology, household waste or not or imported? Public interest sometimes decreases during project formation. For us, it is now a matter of continuous reflecting on principles. Challenge of activities on schedule and precise question and remain critical of our interests.
Martijn: Please describe the challenges within the WTC project
Project leader: These are mainly the commercial issues, the bankability of the project. This is not a core business for any of the partners. The whole chain is united and that's already a whole performance. And now it's important to look at the returns and what returns are acceptable. Market risk, which feedstock, all improtant. Business case is still floating. Technically, I cannot judge properly.
Martijn: Are there any risks involved for you in the WTC project?
Project leader: The municipality commits a maximum contribution of 4 million from the European Fund to enable development as this phase is crucial. If a project fails, for example, if akzo is due to take over ppg then we lose that money. Environmental management is important, and we try to unite interests. Importance of town is really on the waste side. Risks lie with methane and feedstock.
Martijn: Who are your internal stakeholders
Project leader: Organogram: administrative and official clients within city, client is an alderman, official is existing organization. Department of economics, specialization clean tech, but other departments like sustainability and waste we keep informed. Communication plan within the municipality to keep them informed through core messages. What information is important for which stakeholders and communication by mail, internal newsletter exc. • Alderman must be informed in good time about the status of the project.
Martijn: Are you aware of the SDG’s and actively steering on them?
Project leader: No.
Martijn: In what kind of phase is the WTC project at this moment? Initiating, planning / design, realization, sustained performance
Project leader: After the exploration phase, late mid 2016. Next we will be in the final phase of the project. Business case re-established and now there is a go / decision to enter the development phase until the end of the year after which it entails a real investment decision. So we are now in the planning and design phase according to your question.
Martijn: Have you divided the work between project partners?
Project leader: In fact, within the private consortium, every equity partner has a clear role. AVR is operator, renewal / van ganzwinkel: feedstock provider, port company: location / capex investment, air liquide: chemicals provider (H2), enerkem: tech provider, akzo: off taker of methanol. I think they will also be a project manager but a decision has yet to be taken. The choice

must be made who will be the leader in this project. For example, port company is difficult because it is in the hands of the government. This is one of our questions from the government, who will be the first contact point. Has a structure already been set up? You actually have 2 consortia's: 1 public and 1 commercial. Together, a cooperation agreement, drawn by private partners supporting government supported. Administrative consultations take place with the alderman and managers of the private companies. Everybody looks each other in the eyes and see if it's okay or not. Meetings are only in order to prevent it becoming a 'Polish' national day (Dutch saying for a meeting with too much people), public interests are being carried out by the port company. They have a business structure that allows this as they are a stand-alone company owned by the government. They are represented as representatives of the public, together with private consortium. Through them, the announcements / changes in scope etc. are passed on to us. Ensuring a two-way communication is difficult for such a project to keep the integrity. Confidence and various interests can bring about the greatest friction within the private partners. Feedstock supplier wants a certain profit margin and there are differences and commercial interests. Our interests are somewhat higher, somewhat higher abstraction, sustainable, jobs, within bidbook tolerances.
Martijn: Are the roles within the project divided between the partnership members?
See earlier
Can you describe the route from beginning of the WTC project up onto now?
See earlier
Martijn: How are the WTC team members selected?
Project leader: We have chosen to run internal coordination through me, operational level together with government and port company contact points. Internal same can go on is the goal. Private partners, consortium, we chose to enable someone else to do so. I operational, someone else's external aspects with project leader and enerkem and akzo and port company, avr. A conscious split and for this we have been selected.
Martijn: Are all needed experiences/capabilities provided from the team?
Project leader: Yes and if necessary, we will get people from outside or within the municipality
Martijn: Do you feel someone or something (company, NGO?) is missing in the partnership?
Project leader: As this is the first factory in Europe of its kind, it is likely that the national government will be more involved. Now it is on an ad hoc basis and not formal. Now it is clear that it will be in Rotterdam, it is important that the national government shifts and looks at the project. Consequences policy on subsidies meoh for example. Local, I think we are well-united. We are contacting universities about the possible rollout of new waste management techniques.
Martijn: What are the goals of the partnership?
Project leader: employment, sustainability, etc., which are quite common and are not tolerated in terms of jobs. We expect something but it's not strictly monitored. Now everything is also moving well, but later this seems to me to be the whole plan now. I think that social aspect would be a very nice addition to this project, but has not been thought about until now. Was not really important up to now. In sequence, which criteria must be met (grants) to land a project here, we are now transitioning to construction. Perhaps in future phase may become more important and I think it could be a very nice support to the current plan. I have not got an assignment from the municipality about this. Also indicates how urgent it is within the municipality.

Martijn: Are there any social goals of the partnership?
Project leader: No, not now.
Martijn: Have you set KPIs to evaluate the partnership performance?
Project leader: No, not now.

Project leader WTC project, R&D AkzoNobel

Martijn: Who are your main partners today (companies, NGO's)?
Project leader: We work with different groups in the Netherlands to create a sustainable transition but mostly with a technological focus.
Martijn. Why are you in the WTC project?
Project leader: Our targets are to create a sustainable transition of our business. We have a target on ecopremium solutions and lower our footprint towards 2050 to 0%.
Martijn: What are your goals on the short term?
Project leader: Our focus is on the business case and getting the project up and running. The business case is still challenging and getting the project to actually work even though we are having great challenges with the PPG hostile takeover we have to keep on going.
Martijn: Please, describe/draw your organization in the WTC project
Project leader: We have a project steerco which meets on a regular basis, a project team who work on the project and we divided the work with the other partners within the WTC.
Martijn: Please describe the role that you and your company play in the project
Martijn vL: I'll share some document with you so you can have a look yourself.
Martijn: Please describe the challenges within your organization
Project leader: As a said before, we are busy getting the business case together and making sure the technical aspects are being taken care of. The hostile takeover from PPG is not helping the whole process but we still have a green light to pursue.
Martijn: Please describe the challenges within the WTC project
Project leader: Communication between different parties is difficult and trying to get all parties to agree on commercial topics. Every party is negotiating and this takes a lot of effort and compromise.
Martijn: Are there any risks involved for you in the WTC project?
Project leader: The business case of course, looking at the methanol price. Methanol is linked to crude oil and therefore is under pressure right now. The project is vulnerable in that way.
Martijn Who are your internal stakeholders
Project leader: See organization diagram
Martijn Are you aware of the SDG's and actively steering on them?
Project leader: The project started because AkzoNobel has the ambition to green it's raw materials to lower our impact on the environment. We began to research our raw materials to see where the biggest impact would be possible. The research lead to Methanol and there we started to look for alternatives. We went to several congresses to get more information and there we met Enerkem. The SDG's were developed later than we started this project.
A.2. Project Organizational Structure Questions
Martijn: In what kind of phase is the WTC project at this moment?

Project leader: We are now in the planning and design fase. The initiation fase has been finished and we now have determined the partners and the location.
Martijn: Please draw the project team structure of the WTC project?
Project leader: Delivered this and can be seen in the report.
Martijn: How (often) do you communicate internally about the WTC in your company/government? Do you have a communication plan? Steer-co?
Project leader: Weekly we have communications with head of R&D and every other month with the steerco following the FOCUS methodology of R&D AkzoNobel. Currently we do not have a communication plan but that will be necessary when we start the capital project and we have to follow Helios methodology.
Martijn: How do you communicate with the WTC team?
Project leader: Every two weeks we have a meeting and whenever it is needed.
Martijn: Do you interact with all the project team members on periodic basis? If not, with how many project team members do you interact on periodic basis?
Project leader: The team is organized in such a way that the private companies meet regularly and the governments meet regularly. So we do not meet the government very often but the port of Rotterdam does. And they are also in the project team.
Martijn:Have you divided the work between project partners?
Project leader: The work packages are set down in a contract (Project Development Agreement for the Initial Development Phase of a Waste-to-Methanol Production project in Rotterdam)
Martijn:Are the roles within the project divided between the partnership members?
Project leader: Yes, the work is devided and when something comes up the work is done by the party which can do this in the best way and is closest to their core business.
Martijn:Can you describe the route from beginning of the WTC project up onto now?
Project leader: We have been looking for a way to preserve our raw materials. After analysis, methanol emerged as a substance that demands a lot of footprint and where we could take a step. In doing so, we have been investigating possibilities and eventually encountered Enerkem on a congress. After a few conversations, we began a bid procedure to determine the location choice. Groningen and Rotterdam emerged as potential locations. After choosing Rotterdam, we went on to develop the process and we have now come to an end in the study phase, where we define the technical outreach points that we can further develop the business case.
Martijn:How are the WTC team members selected?
Project leader: There has been no special selection procedure. From the research I rolled into the partnership. Other partners have sometimes selected specifically and some others didn't.
Martijn:Are all needed experiences/capabilities provided from the team?
Project leader: Yes and when it is not present, we use others from government or business. HaskoningDHV, for example, can be used on different points, and within Akzo there are many different experts on various topics that we can use.
Martijn:Do you feel someone or something (company, NGO?) is missing in the partnership?
Project leader: No, it makes it even more complex than it already is. At the moment it is difficult to keep everyone informed. Now goal is to get WTC off the ground and operational.
Martijn:What are the goals of the partnership?

Project leader: Goals and targets are laid down in the BID book, which contains principles from the various partners. Top meeting between managers of partners and elder, province provides the right goals and principles.
Martijn:Are there any social goals of the partnership?
Project leader: No, not specified at this moment but off course there are a lot of social benefits in this project.
Martijn:Have you set KPIs to evaluate the partnership performance?
Project leader: Not at this time
Martijn:Which social impact method will/are you using if you are evaluating?
-
Martijn: On which levels would you like to measure impact? Site? Area? Value chain?
Project leader: We are already measuring a lot of things concerning social impact and analyse our vendors for good working conditions and wages, equality, you name it. Furthermore, Dutch regulations will ensure the basic needs are taken care off.
Martijn: Are you using a tool to asses and monitor the impact? How often do you gather information?
-
Martijn:Are you actively steering on SDG's within the WTC project?
Project leader: No
Martijn:Have you thought about unintended impact?
Project leader: Off course there are negative effects around this project as we will emit fine dust particles. But I don't know what the other technologies (burning, landfill) will do in this respect.

Questions and answers second interview with project leader WTC project, R&D AkzoNobel (phone)

Martijn: Can you explain why you did not introduce me to Air Liquide and AVR, Rotterdam?
Project leader: I was an deliberate action as the project is now underway and very busy. I did not want to add more work for all the partners. Air liquide is a full partner and active in the project and AVR is a bit more complicated as we are currently in negotiation with them and I think they will back out of the project and I do not want to disturb this process at this time. These are very hectical times with PPG and other things we have to arrange to get the WTC project going. I think you will get a good picture from the ones you have spoken and will speak to.
Martijn: Do you think that the reason of AVR backing out is because of their conflicting interests in burning waste?
Project leader: I do not want to speculate on this matter now, I do not see the scientific relevance of this question. Rotterdam Partners and Innovation Quarter are vessels from The City of Rotterdam and the Province of South Holland so I did not think it would be relevant to talk with them as well. Furthermore, they are not actively participating in the project as the other parties are doing.
Martijn: I've been looking in to the project and found a lot of positive social targets which the WTC project contributes too. Also one interesting negative aspect and that the fine dust particle

emissions from the process. It's something where we are lacking in the Netherlands and can address this in another way
Project leader: In what respect do we emit compared to waste combustion?
Martijn: I do not know but you still emit and could find a way to lower it even further or to compensate for it through another way. Maybe a university like Wageningen can help or Delft or a NGO?
Project leader: It's an interesting point and maybe it's a good idea to compare the emissions with other ways of waste conversion.
Martijn: Is it a good idea to involve another party as a university now? As I said before, you have to have a good idea what you want from this party before adding them to the team. It's really busy as it is and we do not see any risks at this time. Later it could be a good possibility but for now I do not see the importance. The factory will be built in an industrial area and the permits will all make sure we obey the law in every aspect. We also need funding to make sure the business case is sound and a university will not invest into this facility. What do we need and what can we expect from a university or NGO? We work with multiple universities, NGO's and suppliers or customers in several large and smaller projects but then we really see the need to join forces. If we would have built it in another place it could be more useful.

Martijn: What are the barriers in the partnership until now? You mentioned communication before but do you have any others?
Project leader: All is going pretty good actually, companies and government are quite well aligned and negotiations are going well. We agreed on market conform prices and this makes the negotiations a bit easier. The hard part is to understand and know what everybody is doing. Also the slowest party determines the speed of the project. Sometimes this is a bit difficult. Some are operating in a high dynamic environment and others in a slow dynamic environment. We work differently. For example, the government needs to be accountable for the funds they spend to the citizens and we need to be accountable for our stakeholders. We also have our own processes and structure but we have agreed upon a certain structure for this project. Each party internally still follows their structure.
Martijn: On what parts are you less aligned?
Project leader: I think there's a reasonable business case and maybe some parties have more rush than the other so that no problem. If you look at the consortium compared to the partners: The consortium would like to have a big revenue and high prices from the partners but the partners would like to give as little as possible for the products. WTC high price for methanol, Akzo low price. That's why we agreed upon the market price.

Martijn: So do have have other ideas on social impact and the WTC project?
Project leader: If you look at this project, I think that it is a very good step in creating a change. We all know that we are having an effect on the climate and the climate change is creating a problem for the world and the Netherlands. If the sea rises we'll have problems with our agriculture and flooding's of our cities which will hurt the people living here (the country already lies under sea level). Also a lot of jobs are going away and this is a new technology which can last for decades which provides new jobs and opportunities. We need a transition to sustainable raw

materials and new industries and get rid of fossil fuels to lower our impact on the world and keep it livable. This project is an important step to get to the bigger picture and another way of dealing with our waste. Use waste again. The social impact is that we preserve and improve our way of living on the long term.

Business manager, Port of Rotterdam

Martijn: Please, describe your organization
Business Manager PoR: /3 shares of Rotterdam, 1/3 of the Kingdom (Netherlands). Manager / Operator Rotterdam Port Area. 2 parts classical business model: land leasing to companies (a.o. AkzoNobel), 2nd income model is seaport money. Revenue goes to strengthen the competitive position of Rotterdam port. Another side is the public task of smooth and safe handling of maritime traffic (similar to Schiphol air tower). Independent as company but shares are in the hands of government. A reason for independence is professional port and business model business is no longer as profitable as it used to be.
Martijn: How can you now work abroad while you are a government company?
Nowadays, we also have business abroad to help companies in Brazil or Indonesia where investment security is different. They are pleased that a Dutch party brings expertise because our organizational ability and civil expertise are famous. This reduces the risks and companies are more likely to make new investments.
Martijn: Who are your main partners today (companies, NGOs)?
The port company has something to do with all partners. The city of Rotterdam, the province of ZH, municipalities around the port, NGOs, especially with the construction of Maasvlakte 2, cooperation agreements were made to make this possible. Nature compensation, for example. Partnership with WNF, quarterly consultation with our management and nature and environment, nature monuments, environmental federation. Our dedicated department has about 5 people working on this on a daily basis. The weighing of different interests is sometimes difficult, not the whole business has the same direction. There are conflicting interests from the business and from NGOs.
Martijn: Why are you in the WTC project?
Classic model no longer works. Real major investments for, for example, petroleum will not rise sharply through new initiatives. Existing cluster was built between the 1960s and early 90s and these are at the bottom of the merit order. Plus the social challenges, climate, digitization, shale gas America, low commodity prices elsewhere in the world. How do we keep this area, cluster vital and conserve a license to operate. What we have done, what we have reinforced and stimulated new initiatives. What are the buttons that the port company can push? M2 price and seaport price can be adjusted but this will not matter to the business case. From the chemical cluster we have defined a number of molecules. Syngas, glucose fructose for fermentation products, and aromatics olefins. And have been looking for projects that end up with the intention to join and make the difference. As we step in, we increase bankability and we can account for the government as it contributes to creating a new industrial cluster.
Martijn: What are your goals on the long term

Reinforcing the cluster, business development works on energy and climate transition to meet climate agreement paris. We have defined a number of scenarios in which combinations of technologies and market and social developments are combined on how to reduce CO2 emissions in this industrial cluster. Other than just saying, we close the tap and we go home. And to think about what steps we should take over a period until 2050 and then back. You cannot choose any of these scenarios but you can look at all those scenarios you should do at least.
Martijn: Please, describe / draw your organization in the WTC project
Port company, ceo, cfo, coo. Under commercial department, project development, Steergroep, all members a group, project management team, all members a participant.
1 x per 2 month consultation with Deputy Adrie Bob Lenstra (ZH) Economic Affairs, Marsen Stuivenberg Alderman of City Rotterdam, Marco Waas, Allard Castelijn Port, or Rotterdam CEO. Below is the working group of municipality and province of economic affairs which meet for 1 x weeks. I was very involved but it grew too big and I delegated it to a colleague. Furthermore, I'm not assisted but if we have questions about pipelines, the environment, etc., we will involve other colleagues.
Martijn: Please describe the role that you and your company play in the project
Coordinating with Ernerkem, along with akzo public affairs to economic affairs, county, municipality. Permits in particular DCMR and coordinate process around heads of agreement on supply contracts. Contracts of methanol, supply of oxygen air liquid, delivering waste renewi, delivery of steam electricity AVR, licensing agreement Enerkem. I manage the process of negotiation, formally I am impartial, but I can send something to the left or the right to help make decisions.
Martijn: What are the goals of the partnership?
See earlier
Martijn: Please describe the challenges within your organization
See earlier
Martijn: Please describe the challenges within the WTC project
N / A
Martijn: Are there any risks involved for you in the WTC project?
Everybody puts in 150 and in the next phase the project goes to 8.5 million, which is distributed fairly across all participants. Hopefully, the municipality and the province will make a contribution and eventually, if the factory is being built, we will invest in the factory itself with shares. Up to max. Xxx million euros, but no more than the largest amount of another party. Good exit must also be defined because we do not have the intention to stay for ever. We do this to get the synergy of the ground to show the outside world that we are proactive and want to contribute with risks. Financially, it is a risk and reputation damage can occur.
Martijn: Who are your internal stakeholders
See earlier
Martijn: Are you aware of the SDGs and actively steering on them?
No not known.
Martijn: Do you feel someone or something (company, NGO?) Is missing in the partnership? Not really, we as a port company regularly inform pro-active NGOs about developments. So far, the project is good, because of location, no environmental nuisance.

Martijn: What are the goals of the partnership?
See before
Martijn: Are there any social goals of the partnership?
For us this would be a nice extra but the first step is stepping stone for circular syngas production. Strategic framework 2050 is leading and this project fits well. Cluster development is key but we did not formulate any goals. We have targets per 5 years on CO2 reduction, capital invested and on returns. We do measure it but it goes too far to say that we steer on it. As a port company, we are taking steps to report CO2 emissions, so we are starting to do that now. In a sense, we send resources to contribution to development, but it is not yet that we actively say if an investment does not lead to a saving of CO2 it can't go on.
Martijn: Have you set KPIs to evaluate the partnership performance?
No now, really project, scope and fence around it, return business case, phases reach timeline.
Martijn: Which social impact method would you use?
N / A
Martijn: On what levels would you like to measure impact? Site? Area? Value chain?
N / A
Question 6: Are you using a tool to assess and monitor the impact? How often do you gather information?
N / A
Martijn: Are you actively steering on SDGs within the WTC project?
N / A
Martijn: Have you thought about unintended impact?
N / A

Three managers from The Province of South Holland

- Program manager project green circles,
- Project leader WTC, economic affairs South Holland. Specifically assigned to chemicals and industry transition towards biobased and circular economy
- Manager economic affairs province South Holland.

About Green circles: Together with Heineken, wageningen universiteit, naturalis, hoogheemraadschap Rijnmond ambitions were defined and developed a method which is focused on networks and realizing a dream. What kind of dream do we have and what do we want to achieve it together? Program is very broad and gives a certain course. Specific directions change in time but is based on networks and determining the path and speed together.
Each organization has a program manager and together we are trying to pursue the ambitions we have given ourselves. Climate neutral brewery, climate neutral value chain, biobased economy, sustainable economy, circular economy and is very important for us South Holland. We want to develop knowledge and share this openly. We do this through internet and share everything who wants to know. Even competitors, we share everything about sustainable development. Open innovation. Important starting point is that we see nature as a partner not as enemy but as partner. How can nature work as partner and not as limiting factor? We've got a small team within the

province and try to get together networks to start projects from the government. In finance, resources, knowledge we help out the several projects within the program. We've got 5 themes: mobility logistics, biodiversiteit, living, raw materials and circular economy.
To add to you research topic, Heineken also has the same approach. Currently there's no consumer for a climate neutral beer but this will happen in the coming years, even though we don't know when. It will happen and when it does we are ahead of our competitors and because of intrinsic values they feel that they have to shift towards a more sustainable company.
Manager economic affairs is busy with creating a policy for the biobased economy, scouting policy making on circular economy in a broad spectrum. What kind of options, chances does the province have to contribute and develop a vision with partners such as groene hart zuid-holland zuid, green port, other provinces. A new project, transition campus is in development and how can we help business with a certain vision (man on the moon), what a limitations and how can we connect knowledge experts from universities in South Holland to business. Now we are scouting the field for partners and investigating projects or visions from the business and trying to link the universities from Leiden, Delft and Rotterdam which all have other specialties. The social component is also on the agenda, system innovation, social innovation, technical topics, legal topics are all on the agenda's.

I gave short explanation about the thesis and AkzoNobel so interview subject is known for participants.
Program manager Green Circles : during our network day for the Green circles it was a frequently given compliment that the diversity of people attending the day was tremendous. From the deputy general and Heineken director to a bee keeper and farmer they were all mingling and talking about their problems. Municipality, siemens, Heineken, citicens, farmers, eneco, bee keepers, other companies, 'waterschap' all coming together. Something to really cherish as it delivers a lot of value because of the several perspectives and insights from several stakeholders. We are serving a broader market. Nice example is a new project in theme water Heineken has almost clean but warm waste water which is emitted to the Old Rhine. The waterschap does not like this and together with the university of Wageningen (agriculture) and the waterschap we came up with a purification swamp on the terrain of Heineken which can clean the water and loose of the heat before putting it in the Rhine. So we did it and you could argue that that's enough. But no, it isn't enough. Eventually we said; what a nice area is this now we should open it for the public. People could fish here and leisure and enjoy nature, so we opened up the area for people and they can use it for Sundays to walk, ride a bike. We also build a little fish jetty and created something new! Together we made this possible and that because we have ambition, we trust each other and we see each other more often. We could also have put a wastewater filter in and dumped it in the Rhine, has the same effect. Clean water in the Rhine. But no, its an investment for 1 million euro for Heineken to get the swamp, we will experiment with bacteria and gravel. It about 30% more expensive, but Heineken is making a difference for the neighborhood together with the waterschap and also gets a better image. The citizens don't think what a dirty ugly factory in our landscape. No, let's walk around and enjoy the scenery.
What are the social goals from the province when you think about the WTC project? OR ideas you could have thinking about this topic?

Project leader WTC : Waste to chemicals is an important project for the transition for the harbor. Transition of chemicals and industry. It's one of a kind in Europe, there's one in Canada but this one will be 4 times bigger. So that's new, and that means there will be challenges for which they could need our help because it's new, innovative, has risks and more companies are participating and for none of them, this process is core business. And we think it could have a big spin off for the region in 3 themes. Waste, development in waste roundabout, diversifying of value of waste trough R&D and from output through methanol conversion to other high valuable products which could also have a big CO2 storage capacity. This links with our ambition on CO2 reduction from energy. We also have a technology and knowledge and innovation side just like the centre in Edmunton Canada which Enerkem has built together with government and neighboring universities. IF we could have this open for public and create an open innovation this would be very valuable for the region as it make it more interesting for companies to come have business here.
We have made a work package cluster development and the outcomes are in concept and are being controlled at this moment. You could use this and check our goals.
Martijn: As far as I know you did not set any social goals as getting poor people to work or did you? But also innovation and getting more researchers into the area. For us yes, but work and education is very important for Rotterdam. The alderman also looked at the request and there stood that 50 people get a job and extra hundred for construction and a hundred around the company itself. And those are the subjects for the municipality. This is a target for the municipality but not anymore for the province due to new policies. But on every government level, it is an important subject.
Also companies are establishing themselves near education locations to get good workers who live nearby. This is an important topic for companies to establish themselves in an area.
Program manager Green Circles : An example from the 'westland' is that there is a big shortage on manpower for working in the greenhouses there. The province and the municipality have conflicting interests as the municipality wants workers brought in from Poland and the east of Europe to live in the rural area and the province want them to live in the cities where all the facilities are. Hundreds of them are now living 200 kilometers away in the Veluwe. This is surely a social aspect! Economics are driving the problem because of the shortage but in the end it is how to give these people a place to stay. Also environmentally it does not seem very sound because of the long way they have to drive every day.
Project leader WTC : You could look from the inside of the project but we often see the value for a project coming from the outside through collaboration. Perhaps people from Rozenburg could have a say how they think the climate could improve. Transition projects often mean that a lot of jobs are lost for example by automation and manual labor is being replaced for higher form of labor. Also other companies could join and create new jobs which also make a better place to work in general by ensuring higher level jobs. The social climate is improved. Program manager Green Circles : I recently say: Local is the new global and people with the government create a new way of living by working together. If its about energy transition, water management, recycling, upgrade waste. Local is more than often in the lead and look for opportunities.
Martijn: In WTC I see a lot of economic, environmental goals but I don't see a lot of social goals yet, next to jobs. What are your thoughts about social impact? What would you like to see?

Program manager Green Circles : From the highest level, we take care as the government, of 3,6 million Hollanders. We need to ensure that they have dry feet, that they can ride a bike, have a job in the neighborhood, have a house and have easy transport to their work. Manager economic affairs : You could easily connect it to the budget indicators of the province? That's a good way to look at it and what I want to say is that our core business is to create this for the people.
Project leader WTC : Economic policy is not all focused on companies. Big projects and frontrunners are sought to create a system change and we want to help them through this. The rest of the companies, if you do not adjust, don't look at the value added for society, we do not support you and we do not have anything for you.
Program manager Green Circles : Food is for 70% dependent on bees butterflies. Heineken want to give an impulse to their surroundings. My responsibility does not end at the gate. Bees are also important for our business as they help to create their Hop and barley used for making beers. The surrounding should be better and the bees should be better. A big network of more than 200 people has been created and organizations, amongst AkzoNobel. We give tulip bulbs to schools, we don't cut the grass completely anymore. Several people (mayor, director Naturalis) stand up and say, we will make this happen. We give a subsidy and it takes of like a rocket. Good for the bees, good for society, biodiversity, Imkers give classes to schools. Sharing knowledge is important! Heineken is using this experience throughout the world. Archeon is also involved and has a big network of 250 museums in the rest of Europe and will use this knowledge and plug it over there. Another aspect, Archeon called two weeks ago and they have a problem. They have a waste problem due to the many visitors and want to see trough green circles if we can find a sustainable solution for this. The hoogheemraadschap is investigating in local waste water management and were looking for a pilot so we called and now they are meeting each other next week to discuss the possibilities. Something new is born in a spin off and is growing because of the way we work in the greens circle.
Not all initiatives are interesting and I'm not here to keep Heineken a float but these are things we would like to help because it helps the bigger picture. Heineken needs clean drinking water and in this way we help nature and this eventually helps a new and dynamic system region by helping Archeon, Heineken. Nature, business. We need economic strong clusters and economics are affected by nature, recreation, chemical clusters, multinationals, everything overlaps.
Manager economic affairs : What are the specific characteristics in the harbor looking at the green circles? Project leader WTC : The port of Rotterdam is very experienced in this area and have worked with the westelijke maasoever with milieu federation and how can we all be involved with this area. Make sure that we create something good. I think that the Maasvlakte 2 is a good example with mutual game approach. They had plans for multiple years and they were rejected every time. Eventually they said, we have to change because this is not going to fly this way. They invited every party in that area and started negotiations with all stakeholders and interests and looked at all the facts. They got the project to work and every party could say that they were taken care of. Even kite surfers were heard and they got a new spot to surf which wasn't very expensive.
Sometimes we hire an external party to steer the partnerships and guard the process. It sometimes helps to get the parties together. Try to get over your own shadow and it sounds soft but it really helps.

Project leader WTC : about the WTC: we could get waste from the neighboring cities. Ultimate thing is what we could achieve is that the regions thinks, I'm proud off this factory!
Another interesting thing is that we as Province we also give permits to operate next to that we support this. DCMR executes this for us and for this project, we stimulate is because of the positive sides but the environmental permit should go through the normal cycle even though we also support the permit application by helping with the DCMR by adding extra manpower. Its important that the permit is executed very well. Fine dust, NOx and SOx are being emitted and Region Rotterdam is a hotspot for these gasses. Action program air quality is one of the projects of the province. If you can add to this and ensure that people do not breathe in these gasses it would really help.
It's a nice example of energy transition and innovation and existing law and regulations. On one hand we want new innovations from companies, transitions to another economy but on the other hand we give DCMR orders to maintain the environmental permit and rules of these companies. We should better talk about these things and discuss it together to see were regulations and permits can come together and still keep it safe.

Director Government Affairs, Enerkem

This interview was made by phone as the interviewee lives and works in Ottawa, Canada.
Martijn: How did you got to work with the government organization in Canada and build you first plant?
Director: The municipality of Alberta had a problem with the ending lifetime (8 years left) of the landfill and the alternative of a new landfill was far away which meant they had to use trucks and pay more money for transportation but also in that way emit more GHG (Greenhouse gasses). They started an alternative search and examined around 200 technologies. Enerkem turned out to be the best from the selection and together we started the project. The state of Alberta also came in as they saw the potential of this technology. Alberta is seeing a loss of jobs because of the declining oil industry and downturn in oil wells and wants to diversify the industry and get away from oil to ensure future jobs and a vital economy in Canada. Another important target is to reduce GHG.
Martijn: Did you run into any difficulties during the process working with the government because of different goals and interests?
Director: Not really, the most difficulties were seen when the government officials changed and other priorities were set by the government. We had to lobby to get the government officials on our track and convince them once more to support us. For them jobs and getting taxes and GHG out of the new plant is very important so we also focused on that to get them aboard the project.
Martijn: Did you see any differences between the project in the USA , Canada and Europe?
Director: Yes, the focus of the American government is more to have energy independence so they don't need to import oil from foreign countries. But they also have a big focus on jobs. Europe is very time consuming and the process needs a long breath.
Martijn: How did you go about with the social aspects for the new plant in Canada ?
Director: we started an analysis early to make sure that the investment we want to make, as a small company, is worth wile and we do not get any surprises and loose our money because of protests

of the community or environmental groups. We started talks with the local government, the local business associations and also had an open house for the community where we explained the entire project. The project manager, a PR person, myself and a local consultant were there as well. We rented a cheap school to invite people and also made contact with a local newspaper to write and article. I think as soon as people tjink they have a say, then they will complain a lot less.
Martijn: How did you came about this way of working?
Director: After since I came to Enerkem we always did it this way and think its Canadian? Then again, when I think of it…. I do believe it's also a regulatory demand to get the permit. You should consult and inform the public before venturing a new business.
Martijn: What kind of social indicators do you use or other indicators used by Enerkem?
Director: Do you mean inside our outside focus?
Martijn: No I mean both, whatever you have made is interesting to me.
Director: I think we have made several indicators (KPI's), each department has two which are used by the entire company but they also have 15 of their own, including the 2 which are shared. I can't sum them up right now but I'll send it to you later.
Martijn: What are the most difficult things you came across the project working with the government?
Director: Certainly the power issues within the government. When there was a change in power we had to make sure that the new persons were focused again on our project and intentions. Fortunately the provincial leadership is very strong and they also made sure that the project was on top of the lists. Now Europe is interesting to see that things take a long time, that's not easy but still, we have to go through this process.
Martijn: What kind of activities do you perform with the community?
Director: We will have a celebration and invite the local community but I expect that the attendance will not be very high as this whole project is playing for quite some time now. Things are getting old already and everybody more or less knows what the project is about because of our communications. The location is also not very ideal as it is a 30 min drive in the middle of nowhere.
Now I think of it, the municipality gives guided tours across the factory to grade 3 and grade 6 children to show them how to recycle and where our garbage goes. We do not have anything to do with it as the waste is provided by the municipality and they take care of everything. They hope to educate the children so they start recycling and also confront their parents about recycling. They build an area so the children can walk around safely with a walkway which is cleaned very well with safety windows. We could not afford to do this as we need all the staff and resources for our technology to keep our company growing and healthy. I don't think this is being discussed in the Netherlands.
As the city also owns the sorting facility (sorting out waste to be used in the plant), they have brought in a project to help underprivileged and physically challenged people a job. Even though you could say that the job isn't very nice because they are handling waste, they get transport from their home, a decent wage and good secondary conditions. This way the underprivileged have a chance in participating in society.

Development manager Cleantech department, City of Rotterdam

First Development manager and I had a short introduction about the intended research.
Development manager: It is interesting to see that you are investigating this topic. I think that AkzoNobel and similar large companies work like big mammoth tankers. But they can't survive using the same business models as they use to. The world is seeing 3 different trends which make big companies vulnerable and they need to change the way they operate. Change to a speedboat instead of the mammoth tanker which used to grow and survive trough take overs and acquisition. Change into a learning organization which knows how to deal with complex partnership projects because that's needed to make a partnership successful. That's why I find the WTC project so interesting as AkzoNobel is not buying Enerkem as they might have done in the past but wants to work with them and the government to venture in this new project. Next to that they are also investing in this new facility and not only taking the end product as a client. Come to think of it, that's also quite special. The environment is changing. From a micro economic level, we as Rotterdam had the biggest port and created a big pull for companies but now we are the 3rd biggest in the world and investments are not done in this part of the world but primarily in Asia. We have to create a transition towards a new economic system. Also we actively have to change and help innovative companies to establish in Rotterdam. This will also act as a magnet for others. The new network economy which is needed needs new people, new way of working (in partnerships) all because of the global trends as globalization and digitalization but also you see an interesting shift toward a local focus. From a bigger perspective, the Government in the Netherlands is quite small compared to other rich countries and we cannot spend too many resources on all kinds of projects. Therefore, if we want to innovate our economy we need partners from private companies. Companies like AkzoNobel who can deal with the technology were we aid in finding extra funding. But they can't do what we are doing and operate the same as the environment is changing rapidly if they and we want to survive and we do too. If you look at the special role the port of Rotterdam is taking as a public party in government hands. They are actually investing in this project, something they have never done before and that because they also see the need for change in our port. We cannot operate the same way as we are doing from the sixties with large companies investing as they did before, the focus is on Asia now and funding for them is hard. We must ensure the right investment climate to make the change possible. Our biggest social value is to create a sound and sustainable new economy which can profit the next generations.
Martijn: What are the social goals you strive for?
Development manager: We the people in Rotterdam to work, live safe and have a high state of well-being. Primarily this can be done by providing sufficient jobs and keep people out of poverty. We are losing jobs because of the fact that business is shifting to Asia and Amerika and we need to compensate this with new ones which also have a sustainable lifetime. So that means that the factory can operate for quite some time.. For me, economics and sustainability are closely entwined as a good economic system provides jobs and social well-being. I think that the two cannot be seen as individual entities or topics but that the two are one to create a good business model fit for the future. Currently we have got around 10% people without a job and that's a lot for a city.

Martijn: Enerkem and the government in Canada have created a place where children and people in the community can learn from waste recycling by giving tours and lectures. Is this something to do in Rotterdam?
Development manager: Yes off course, but we are now in a position where everything is not certain yet. The partners have to agree and the business case is not sound yet. As partner we are actively searching for subsidies from the government of The Netherlands and Europe because they are also trying to make a transition. You can also see that Europe is giving back to the regions a bit more to help them develop so we have good hope that they can also contribute. We are very busy with this project to make it fly and after the final investment decisions are made we can look further what we can do to involve the community. The project has an order of priorities right now and we can just do everything at once and have to focus on the execution. The bidbook has taken a lot of time and there we have put down our ambitions and agreed on the projects and funding per company and government. If you talk about education and the need for recycling than I think we fall short in The Netherlands by relying on the public too much. You can forget it if you think that everybody is going to recycle and use solar cells. I believe that regulations are needed to push this forward a lot faster. The government, from my opinion, has a bigger responsibility to achieve this as they are doing in Germany for example.
Another thing what we hope to create is an innovation centre. If you look at Rotterdam you can see that the biggest companies are not represented in our area. They are all somewhere else abroad and we would like to change that. We want more start-ups and researchers in our city so spin offs are possible which will make our transition a lot faster. Until now it has been very difficult and we have tried by for example create the RDM campus. 40 million euro's it cost and I wonder what the benefit is. We can't keep doing this because we simply do not have the resources. This project has a certain order of things and we will eventually, after the plant has been build off course try and establish this but for now the primary focus is to get the project up and running for a longer time and so secure jobs and the start of a new economy.
The WTC will produce methanol and through research more products can be invented but also for the syngas. Our ambition is to create an open innovation Centre which will attract all kinds of start-up and researchers who will work as a catalyst and create a new chemical cluster in the harbor. Working with universities Wageningen, Erasmus and Delft to get the most out of the technologies and also make it applied science so that we can move on. Biotechnology, or biochemical, biofuel, circular economy, all things which have to be developed further and it needs highly educated people to make a change. Helping the less fortunate is something we can focus on later and see if the company who will operate the plant will create these jobs as well.
For the municipality this project is very interesting because companies who normally work alone are now combining forces. And the interesting part is that all these interests and ideas somehow need to come together to make it work. For none of the partners this technology is core business. The partners are all out of their comfort zone and this needs guidance. How can you steer the project in such a way that you get the most out of the resources. The normal tools you use in a project to steer the outcomes are not useful because the complex nature of partnerships. A nice example how it didn't worked was when I started an open innovation network where more than 60 big companies joined. Some of the participants had second thoughts and were unsure if there

interest were still pursued and unhappy to see their influence disappear because the network could do without their help. It all came to a sudden stop and failed because of this.
Rotterdam has a very complex industry and landscape as all the biggest actors are here and we need to involve them all to be successful as we can't give support to one company and neglect another. That would be wrong as it is public money. Another thing is that we need to be open for everybody as the public money demands this. Private parties find this difficult or undesirable as all their research is open and they are afraid they can't benefit anymore.

Project leader, Renewi (Shanks/Van Ganzewinkel)

Project leader: It's a complex partnership with a lot of parties. Fewer partners would be beneficial as keeping the entire project in the air is not easy. Making the new factory succeed vs your own role in the consortium, how to do it, what to do, but also good fun.
It's quite a large factory and if you compare it with a waste disposal company it has a good size like a regular waste burning facility. The impact is big.
Martijn: So it's a good thing that you are in it?
Project leader: Yes indeed, it has quite some impact on the entire waste stream in the Netherlands.
Martijn: And you foresee in the feedstock?
Project leader: Yes, RDF is what we supply and it's basically high caloric waste with lots of carbon and you can't do anything with it but burn it. Household waste without wet waste, metal and big parts of paper and plastics. A fluff is over, light fraction, things which stick, small pieces of paper, foil, that's RDF. RDF is now always send to a burning waste facility. You have to shred it before you can separate the waste out of it. Almost fully automated, only for a small portion of the waste some 8-9 people are needed. For WTC you won't need a lot of people because the waste is already sorted and that's used in the WTC plant. Only a small cabin with people is needed to refine the waste even further. The WTC waste feed system is built with an eye on the future. There are waste streams to be used in the future but they have to be dried, for example diapers, the government wants to do something about it. Diapers are a nuisance to be recycled and you can do it with the materials but it will take a long time but you can also use it for chemical recycling. You can say, let's start with chemical recycling. That is wat we find interesting in the WTC plant. If you look at the hierarchy of waste disposal, landfill is lowest (don't do it), burning with energy recovery like AVR but then you destroy all the carbon. The interesting of WTC is better than burning because you don't put the CO2 in the air but you create a new material out of it and put it in a tank. That's our vision and mission at Renewi, use less CO2, waste to new products. Big volumes of waste which are useless for recycling and have to be burned normally can now be used for the WTC project.
Martijn: Why do you think it's important? Why is this you vision?
We believe in waste no more, it's not only waste does not exist but more a state of mind. If you see waste, do not destroy it but use it. If there are technologies which can turn it into new products and not into energy or heat than we think we should try the new routes to get the most added value out of waste. That's actually also why we divested AVR in the past because then we could be released from this option and have our hand free for recycling. You can also see the change in the philosophy. The market is changing and they say, should we burn at all? In the past you only had a

landfill tax but now you also have a burning tax (13eur/ton) since 2 years. Also CO2 tax is possibly coming and this would really be interesting for the WTC plant. Waste burning will have a tax on its output. Our customers will be interested because they would not have to pay these taxes in the future and this will give us a competitive advantage.
Martijn: It's a method to discourage companies to keep burning and create innovation you think?
Project leader: Yes indeed, 13 euro is not a lot but it shows that they show that something has to happen. It's a first move.
Martijn: So you are looking to the future and are anticipating that this will give more perspective than burning.
Project leader: Yes, that why we divested AVR even though you'll always have to burn a small portion but we want to recycle. We see that with new technologies which can obtain the materials. We are participating in a lot of projects to make this happen. If this technology wasn't as far as it is we would not have joined but this is already running in Canada. A lot of technologies are emerging from the horizon and we have to do something with it.
Project leader: LAB3 (landelijk afval beheersplan) is emerging and gives the country policy of waste disposal every 10 years. Chemical recycling is now mentioned in the new one (3) and is preferred above burning and waste landfills. Je must make a product which is not used for combustion. Depends on where you want to use it. If you convert waste to methanol you must use it for a non combustion application. This is also mentioned in EU policy.
If you would make it DME than you will use it as propellant and it will be still send in the air. How will the world work with these technologies?
Martijn: The AVR is also in the consortium but do they have conflicts in this matter? They have a very big waste combustion unit.
Project leader: If the plant were to be built in Delfzijl than another company would have operated it. EEW would also liked to have participated. They said there, we are also are thinking about two options in conflict. This technology will replace burning technology for a large part. But they said that they would be interested to create one of these instead of a new burning line as a concern. We can see that this is smarter perhaps if one looks at the horizon of materials. I think that AVR is thinking in the same way, they have 7 burn lines and a fantastic contract with The City of Rotterdam for a too high price and long lead time till 2030. This is to get on board to get the volumes and the market. Because burning waste is deemed to stop in the future. Also there's a waste stream which cannot be burned in a waste burner (waste burner 7-11 MJ/kg , WTC 15 MJ/kg). We deliver the waste volume exclusively and AVR will operate the plant. If I would be the Chinese (owner of the AVR) from a strategic point, I would skip the burning step in China and go to WTC immediately and use it for ethanol or methanol.
Martijn: These are conflicting interests and make it difficult to work with other companies and how about the waste from Rotterdam, you said Rotterdam has a contract with AVR?
Project leader: The waste from Rotterdam goes to the AVR for the next years and will be burned. We will get the material from everywhere. 1/3 from Belgium, 1/3 from Netherlands, 1/3 from England. That's the basic starting idea but we want to look at this industrial area to see if there are more materials such as waste water sludge or bottom residue from tanks. We need to have the plant, have it operational in a good way, and then we can investigate other feedstocks and test it real life.

Martijn: Enerkem has a nice set-up were they use disabled people to work in the plant to sort out the waste. How do you feel about this?
Project leader: we already have such a set-up in place in other sorting facilities. Wherever possible and safe we can do this off course. We look at these things and will do this later in the project. First priority is getting the plant operational.
Martijn: Which barriers can you see in this partnership?
Project leader: A lot of partners with different opinions, not having one entity, we are all doing it for ourselves and we do not have a joined venture. You can see that the effort differs in time, we for example had a merger of van Ganzewinkel and Shanks and we did not have sufficient time to always speed up the project. We do not have an own operation and this would help to go further and not be bothered by externalities.
Martijn: For Akzo you could also see this off course.
Project leader: Also all the partners slow down and see what will happen before they continue.
I also think that it's a problem that Rotterdam is financing the project but they will not have any financial benefits as city? I've asked this several times in the project; what the benefit of us having you as funder? Rotterdam says that the waste can be taken from other cities around and that they will sort it out. I think it's difficult. How solid is their financial backing? Can they explain this to the public? I see this as a risk. Contract is signed with AVR and they cannot get out of it.
Martijn: I think it's primarily about creating a transition to a new sustainable industry and jobs but this will also be hard.
Project leader: I get that part of their business, that's a good thing. Fossil fuel harbor is logical but I think it is tricky.
Martijn: What do you think about Enerkems way of educating the people and children in Canada?
Project leader: I think that this is normal and has to be done with the first WTC plant, It really should be done especially for a novel concept as this one. Open up the plant and give tours. Professionally too and not as amateurs with students or something. Everybody wants to come and watch.
Martijn: Would you like to educate people in recycling?
For us, if we look at the future, it is too expensive now to remove all the rest products but what if Ionica gets it done and knows how to convert PET to a monomer and then make a polymer again. A very nice circle. The PET which is in the RDF can be taken out. If they can do it and convert very dirty PET into a monomer again than we can improve our sorting lines and we will still innovate with recycling and the basis will be the WTC plant which always make product. We see the development of this sorting line as the future to be able and adjust to new innovations. Integrated waste solutions centre. A good material cycle. That's what the cluster development is doing and is about the cluster around the plant. Schools, mini WTC, testing, Universities, research, lets test if we can use all the materials here around with the chemical industry. The first unit in Europe! The Netherlands will benefit and get a position because of this. Cluster development. Now we are purely developing the project to get the plant up and running. Martijn: What kind of people do you need in a partnership?
Project leader: People need to dream a little bit. If you only have logics then you should not be involved. Reasonable people who see the problem of sending CO2 into the air like we are doing now. You need to have belief, burning should stop if you can make methanol out of the same

material. Industrial leaders are on the forefront in this and that's needed. The business case is not very appealing, money is not flowing out.
Governments are enthusiastic but they have difficulty finding funds to support us because we have SDE (sustainable energy subsidy) if you cut down trees and burn (biomass) them you get funding but for this WTC there isn't any mechanism. How? There is no initiative except ours now and they just haven't thought about it before. There is no instrument for sustainable materials yet. Everybody says; we want to support you but we have no idea how. You see that the governments in the Netherlands now see that it's possible and they are thinking about new ways to create funding for these projects. It is a true frontrunner and everybody at the government thinks this is a good idea. It's crazy that the government is supporting the biomass furnaces because it's not good. We can make a product out of it! The regulations are not made this way. With this installation people are thinking about the regulations and that's also impact because it will change. CO2 tax will not work if you only have waste burning and then only companies who supply the waste are effected because the burners can say that this is the only method to get rid of the waste. With this new technology this isn't true and then the CO2 tax will have substantial benefit because companies will want to have it made into material to also avoid taxes.
Martijn: Are there any negative effects of the WTC plant?
Project leader: In this environment we will have around 12500 trucks on this very busy motorway (A15). Ships are harder because you need to load them and unload them. Waste is almost always transported with trucks. That's a negative effect, these trucks also emit NOx and it's good to look at it from this way. We could need some research which does not only look at CO2 and energy.
Also because we are not in the phase yet were everybody is not committed yet.
Martijn: Do you see any problems in the area?
Project leader: No, in this area everything will be arranged and fall in order. We are emitting the same as AVR but without the CO2. The government is now looking at concentrations and not kg total. When this changes then, these initiatives will happen more.
Martijn: Last words?
Project leader: Where there are no burners, one could also skip he burner stage and have this technology instead. That's also impact. When this technology exists you should not be allowed to have burners anymore. Now Europe is building burners with funding but it should not be possible anymore. Actually, if this industry works, then the fossil industry will be there in carbon economy but not with the Shell but with waste were we cut the carbon molecules into C and the chemical industry should find a way into what they want to turn it. Everything could be created with synthesis like with lego. That's a big impact for the chemical industry in Europe. We now have the no waste festival and we give guest classes in universities. We sometimes also ask schools to help with a problem. And now there's one who actually has had a very good idea.

Senior business developer, Innovation Quarter

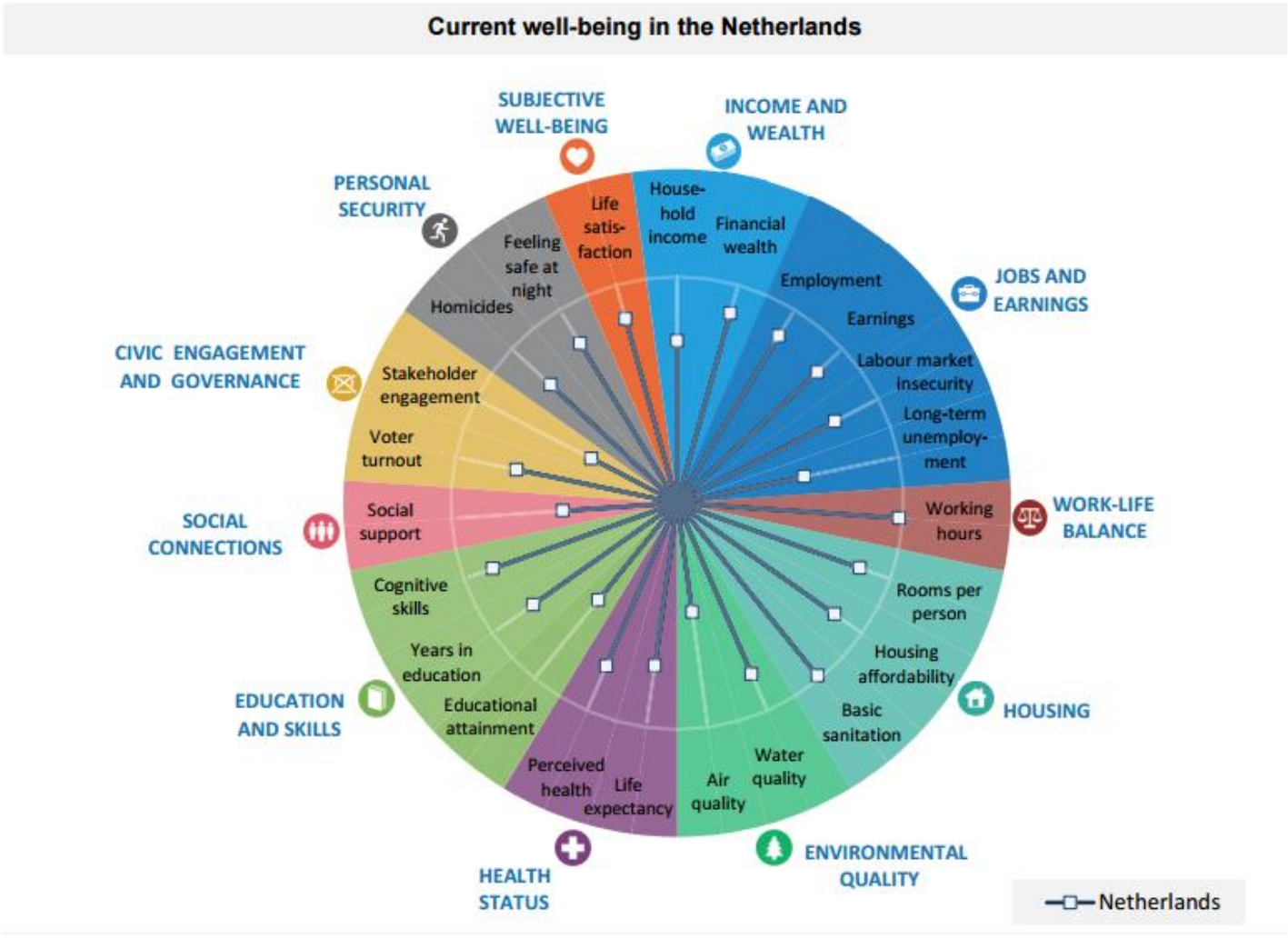
We support starting innovative companies with co-financing. For WTC we will also do it even though our ticket size is only 2.5 million compared to this big project it's just a drop. But every drop is one. Start-up, middle and small companies, and energy fund and start-up fund. Simple small loans which gives them a push for success. Other side is that we pull companies to The

Netherlands from Europe. Business development tries to create totally new projects and help them to evolve. How can we make a cluster which is interesting to join? Clusters are grown because one company started and other joins. An added value of this WTC project is that there will be a factory which needs raw material and has a certain output. Now is known that the product will go to Akzo but when there will be an expansion in the future, other may join o others may add. Just like the chlorine cluster has been grown. Be very active with each other to see what can we innovate, add and improve in a cluster.
Business Developer: I support this way of working of AkzoNobel compared to other chemical companies. I see that CSR is coming this way which makes it better and more fun and is now part of the business case instead of receiving nice little CSR reports. That what we do it for. It's good that Akzo takes a bigger perspective and involve another impact in their business. I see within the government attempts to measure what impact societal projects have and for example look at measurements too see how many visitors are using the facilities.
Martijn: What was the reason you are interested in this meeting with me about social impact?
Business Developer: I have spoken about this project internally; we get a lot of questions from companies who like us to support them. We spend a lot of hours and that's free of charge off course, but we want to be more selective in which companies to help out, because we do not have endless resources. That what they can do autonomously they should do by themselves. From the other way, we would like to add extra support to companies who have a social impact. And take them out of the bulk. Our own KPI is now investment but because we have lack of better KPI's. My goal would be not to look at investment only but one step further. What's the impact for employment or environment? How can we calculate this and you can take CO2 as one of the most evident ways to do this. What's the influence on the province of these projects? I've talked about this with our accountant to try it and do it in practice for one of our projects. What is or was the impact of this project? We could do it after the project with hindsight to create something to measure these things. We invest ourselves off course. Innovation quarter has been started to help the economy, and especially where it is more difficult from a society perspective. So life sciences, biobased technologies, circular economy, maritime.
Martijn: Why is it difficult in these sectors?
Business Developer: The sector where I'm primarily am working in is biobased and it's difficult because a lot of the externalities are not taken into the business case. You see that there are very limited biobased projects/business cases in The Netherlands but also hardly in Europe. Simply because on CO2 there's no price but on energy and biomass there are prices such as the SDE price and subsidy.
Martijn: So that to lower energy but not to transformation to another economy
Business Developer: Indeed, biomass is easier to make energy out of it because you get subsidy through SDE on you sale price but if you would convert it to chemicals you will not have any subsidy. Yes, than the choice is simple and if you have biomass you will go to the energy part and not to the material part. From a study which has been done in Italy, the number of jobs are a lot bigger from materials than for going to energy. From CO2 it maybe the same, but from societal need, you'll get a lot of extra value. Currently nobody is looking at these things. My idea is to make the first step and create awareness in the impact a project has had. That a problem, what is the impact exacly

Martijn: If I look at the WTC project that there could be a lot of added value in optimizing the waste recycling but this needs a lot of innovation.
Business Developer: Yes, and there we create impact but we are not visualizing the impact at this moment. We tell everybody that its really nice and but it is not quantifiable at this time and show the value. Money is ultimately the value which speaks the most. The language from which we all understand each other.
Martijn: Yes that institutional, we all have accepted that a piece of paper has value but now we need to create a social value which has the same level of acceptance and is institutional.
Business Developer: If I look at it there's a third step in this and that's the cluster development and what value has this? We will create the conditions needed to start a cluster and this will create new ventures but what value does this have? That's really difficult. I have no idea how to express this.
Martijn: What I am doing is looking at the SDG's from the UN and see what kind of social value is needed in a certain area.
Business Developer: Puma has an environmental P&L.
Martijn: Akzo has one too.
Business Developer: Such practical things are needed and I understand why you look at the SDG's because it will give a good basis.
Business Developer: One question I have is for how long is this calculation made? What's the term? Long term impact? The province has a big stake in it but for example Rotterdam may not because not all personnel will come from Rotterdam but from surrounding cities and villages. Waste will come from west Europe (Belgium, Netherlands and England) but after the contract of AVR ends you want to get the most of the waste. That's also very valuable to achieve. Is waste burning adding to you recycling goals? I think that we are not looking at these things sufficiently from a financial perspective. We do not have to talk with Rotterdam alone but also talk to the province, municipalities and wider. Above 1 million households are in the vicinity of the new plant. Primary it should be about having a cheap way of waste disposal, following recycling goals of municipalities which are not being reached and next to this it should add to
Business Developer: If the municipality would do the same as you are doing and really measure what the consequences are of their actions. We are saying a lot but we can't prove it or see it and companies are now on the forefront doing this but we should also do this.
Martijn: It is not as tangible until now as you would like it to be.
Business Developer: I think we should also develop this as well. Akzo and WTC is a very nice example to get more knowledge on recycling. What are the effects are there on the long term, will people get to recycle more? I have no idea how to measure this now. I think it's too complex at this moment.
Martijn: I believe that putting goals in place and creating a program to achieve these goals is needed. Also with economics you will present a certain outlook of the future of how your product will sell. The goal is critical and then comes the value and KPI's. For example, you could measure the effect on recycling for people and see how they are progressing because they will create less 'rest waste' .
Business Developer: After a couple of years we can measure these things better trough experience. How do you know what the impact would be from advance? That's the same as for economics.

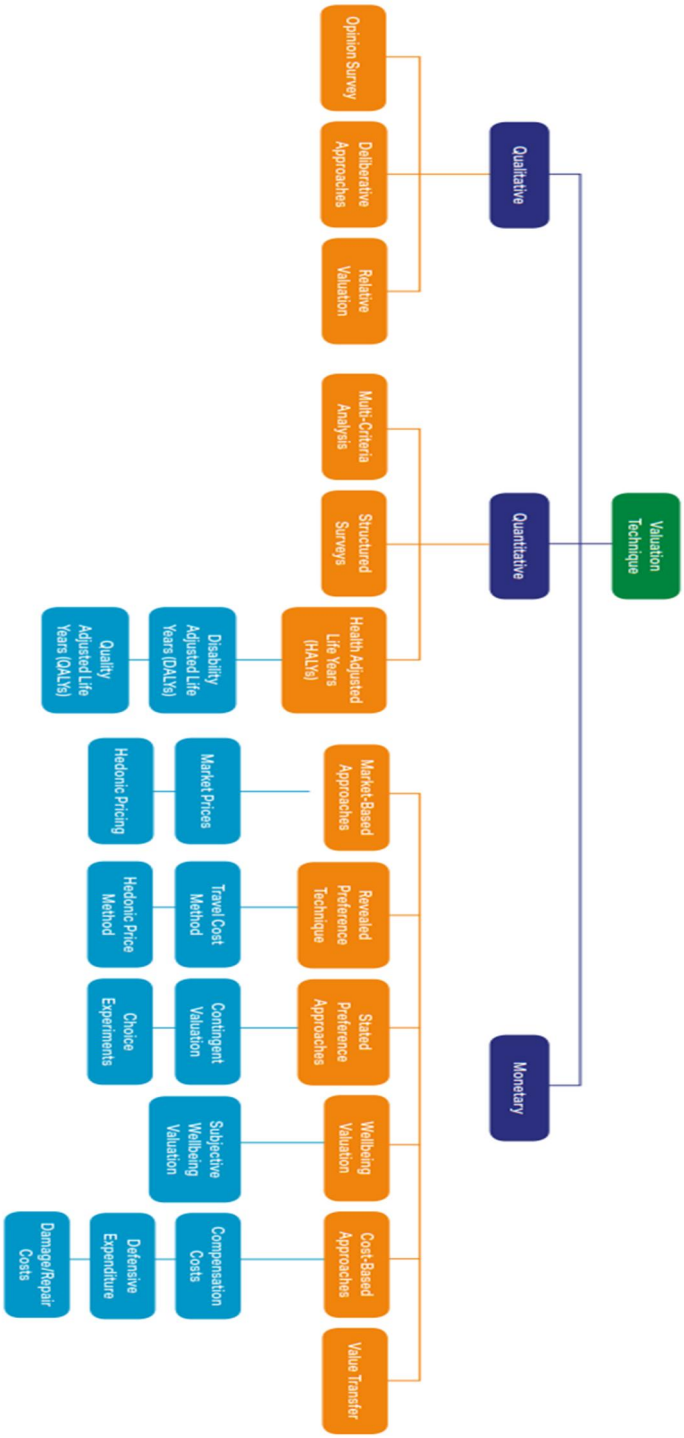
Martijn: You could put goals in for start-ups and innovation and track the number of new ventures and growth of the ventures within a couple of years. This can be used to show Europe and request funding for example.
Business Developer: That's exacly how you can get subsidy than on primary support on the business case itself. That's what economic affairs gave back to me. We shall see, I don't know all the roads and they may also do not.
Martijn: They are also very big and can't know it all?
Business Developer: No, you can't either,how many people work for Akzo?
Martijn: 45000
Business Developer: You can't know them all and all of them have a face to the outside. Not everybody knows it all or just as well as the other.
Martijn: What's happening in China? I really do not know completely.
Business Developer: In the BID book procedure of the WTC we talked about this and talked about it with social affairs and work and income. What can we provide? Consortium was asked what kind of education would be needed? Can we use people from factories which are shutting down or becoming smaller? But those are all nice to haves and you need luck to happen but you'll not calculate impact with this in mind. I like the way you look at this and use the SDG's as goals, certain category because you can have a look at the Netherlands and see what we need in here. This project will contribute to these goals.
Business Developer: You can see with LCA's that the methodologies are different and that the scope is always arguable. Where does the product begin and where does it end? Social impact is also subjected to these boundaries.
Business Developer: I like the way you are doing it and make it transparent for everybody. We can have a discussion about the starting points. We should be starting this and use these kind of measurements.

Appendix D: Visualization of the ’How’s Life in The Netherlands?’’ Report (2016).



Appendix E: Valuation techniques

(Source: Social Capital Protocol, WBCSD, April 2017)



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