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# The potential of self-governance in stimulating sustainable consumption of mobile phones

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A case study on corporate intervention options for KPN



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## Preface

This thesis is the final project to complete the Master Sustainable Development – Environmental Governance at Utrecht University. The objective of this thesis was to contribute to insights on corporate intervention options for a business strategy on sustainable consumption of mobile phones, and to scientific literature on the role of businesses within the mobile phone industry in stimulating sustainable consumption as a form of self-governance. During my internship at KPN I gained considerable knowledge of business processes, corporate sustainability and all related aspects.

I would like to express my gratitude to my supervisor from Utrecht University, prof.dr. Peter Driessen, for his supervision and guidance. His support and constructive criticism has proven rewarding. I would also like to thank dr. Walter Vermeulen as second reader of this thesis. Furthermore, I would like to thank everybody who has contributed throughout the thesis process, the employees and those who I have interviewed at KPN, for providing the necessary input. I would like to thank Marga Blom specifically, for enabling the internship and for her supervision.

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## Summary

This thesis focuses on sustainable consumption interventions from a corporate perspective within the mobile phone market. It is acknowledged that increasing levels of consumption largely contribute to the impact that society has on the environment. Scientists argue that businesses can play a key role in interventions towards sustainable consumption, as they are central to creating technology and wealth. This is especially relevant within the mobile phone industry, due to scarce materials that are processed in mobile phones and the occurrence of negative social impacts in mining processes, as resources often originate from conflict areas. This research concerns a case study on the potential for a Dutch telecom provider to include sustainable consumption measures in its environmental strategy towards mobile phone consumers. The central question that guides this research is: To what extent can KPN strategically intervene in sustainable consumption of mobile phones as a form of self-governance on the basis of factors that determine sustainable consumer behaviour?

In order to answer this question, the research has been approached at two analytical levels; the consumer level and the corporate level. For the consumer level, assumptions are formulated on the basis of a literature review on explanatory factors that determine sustainable consumption. In order to test these assumptions empirically, structured interviews are conducted with 40 KPN customers. From the corporate level, intervention options for business interventions to stimulate sustainable consumption are derived from literature, and empirically tested by means of a content analysis of corporate documents and by conducting expert interviews with managers.

The empirical results at the consumer level show that the promoting factor with the most potential to address stimulate sustainable consumption is improving information access. In contrast, a constraining factor is the attitude-behaviour gap, as there seems to be an explicit gap between the positive attitudes of consumers towards sustainability and their actual consumption behaviour. Furthermore, the fact that mobile phone consumption is to a large extent determined by habitual purchase behaviour forms a barrier to address sustainable consumption. These constraints are difficult to overcome through corporate measures. Nonetheless, it is concluded that the potential for KPN, in order to stimulate sustainable consumption amongst its customers, lies mostly in using appropriate communication strategies targeted at specific consumer groups. However, results also show that the negative environmental and social impacts of mobile phone consumption cannot be tackled at a system-level by means of self-governance. Hence, in order to address this problem, other modes of governance have to be considered.

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# 1. Introduction

Consumer behaviour contributes extensively to the impact that society has on the environment. It is acknowledged that an increased level of consumption in industrialized countries is one of the key factors contributing to environmental degradation (Fuchs & Lorek, 2005; Moreno, Lilley, & Lofthouse, 2011; Tukker et al., 2008). To meet the challenge of sustainable development, i.e. in which people and societal actors try to meet current needs with an awareness of the necessary actions to preserve the ability of future generations to meet their needs, changes in consumption behaviour are necessary (Steg & Vlek, 2009, p. 309; World Commission on Environment and Development, 1987).

Sustainable consumption is gaining emphasis in scientific literature and as an environmental policy objective. Both call for widespread changes in behaviour at all levels of society, in order to reduce environmental degradation. On the one hand, environmental governance institutions are growing upwards from state to global scale to challenge system-wide environmental issues. Yet, at the same time, there is a growing focus on smaller-scale governance (Seyfang, 2006). Although several authors emphasize that businesses could take on a leading role in stimulating sustainable consumption (Haddock-Fraser & Tourelle, 2010; Spaargaren & van Koppen, 2009), insights and understandings on why and how businesses engage in this topic within specific industries are more limited. This study aims to develop more understanding on the role of businesses in stimulating sustainable consumption as a corporate sustainability practice.

## 1.1. Research background and problem definition

Sustainable consumption is a challenging concept according to Peattie (2010), not least because it involves contradicting terminology. Sustainability requires the preservation of environmental resources (International Institute for Sustainable Development, 2013), while consumption generally contributes to environmental degradation. "The concept is highly context dependent as a set of practices, as well as complex and multifaceted in both theory and practice" (Peattie, 2010, p. 197). One of the reasons for this complexity is that there is a wide variety of factors that influence behaviour change, especially towards a sustainable direction (Kollmuss & Agyeman, 2002). Also, behavioural and lifestyle issues have a 'value laden' connotation since they resemble individuals' and social identities. However, at the same time there is a broad recognition of the need to engage in this difficult terrain and to develop 'evidence-based policies' to support behavioural change (Jackson, 2005).

Yet, how to define sustainable consumption according to different schools of thought in scientific literature? In 1994, the Oslo symposium stated that sustainable consumption refers to "the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations" (Ministry of Environment Norway, 1994). Several scholars in the field of environmental behaviour argue that moving towards sustainable consumption involves two developments. In the first place, sustainable consumption requires an increase in consumption efficiency which can be accomplished mainly through technological improvements, also referred to as eco-efficiency. In the second place, a development needs to take place to change consumption patterns and reduce consumption levels, specifically within industrialized countries. This requires changes in infrastructures and choices, as well as a questioning of the levels and drivers of consumption (Fuchs & Lorek, 2005; Jackson, 2005; Mont & Plepys, 2008).

The notion of sustainable consumption has not only emerged as a topic for research, but also as focus for policy makers and marketing strategies (Jackson, 2005; Peattie, 2010; Steg & Vlek, 2009).



National governments will have an important role to play in this process, yet they are no longer the “exclusive environmental authority to build upon”. Although initially it were nation states that possessed a monopoly on environmental governance during the 1970s, starting from the 1980s onwards, companies entered the policy field. Subsequently, a de-nationalization of policies occurred under the influence of globalization in the 1990s. In view of the potential roles of different policy actors and the best strategies and instruments to be used for the greening of global consumption, governmental actors are no longer considered as the leading entities. Environmental issues that are increasingly addressed by private parties show evidence for this shift (Driessen, Dieperink, van Laerhoven, Runhaar, & Vermeulen, 2012). Still, the picture of consumption politics in our globalized society is far from clear, although it is certain to include a variety of actors (Spaargaren & van Koppen, 2009, p. 81).

*The role of the business community in addressing sustainable consumption*

To make consumption practices more sustainable, new ideas, information, and products have to be incorporated into existing consumption practices. For a successful incorporation process it is key that companies, as leading providers of new products and services, develop an active orientation towards consumers and their practices (Spaargaren & van Koppen, 2009). The World Business Council for Sustainable Development (2009) states that businesses can play an important role in fostering sustainable consumption: by delivering sustainable value to society and consumers; by helping consumers to choose and use their goods and services sustainably; and by promoting sustainable lifestyles that help to reduce overall consumption of materials and resources. According to Haddock-Fraser and Tourelle (2010), from the supply-side, or business perspective, interest in sustainability practices can be partially linked to opportunities for competitive advantage by taking actions to reduce problems. On the other hand, such actions may be undertaken for altruistic reasons also.

The scope of this research is set within the telecom industry. The telecom industry consists of network operators (such as Vodafone, KPN, and T-Mobile), phone manufacturers (such as Apple, Samsung, and Huawei) and network manufacturers and suppliers (such as Alcatel and Cisco). All actors within the industry have different impacts on the environment and responsibilities to manage and reduce this impact. Figure 1 visually represents the impacts on the environment caused by the actors within the industry. It shows three key elements (networks, phones, and offices) and covers four life cycle stages: material extraction, manufacturing, operation/use, and end of life treatment (Forum for the Future, 2006).

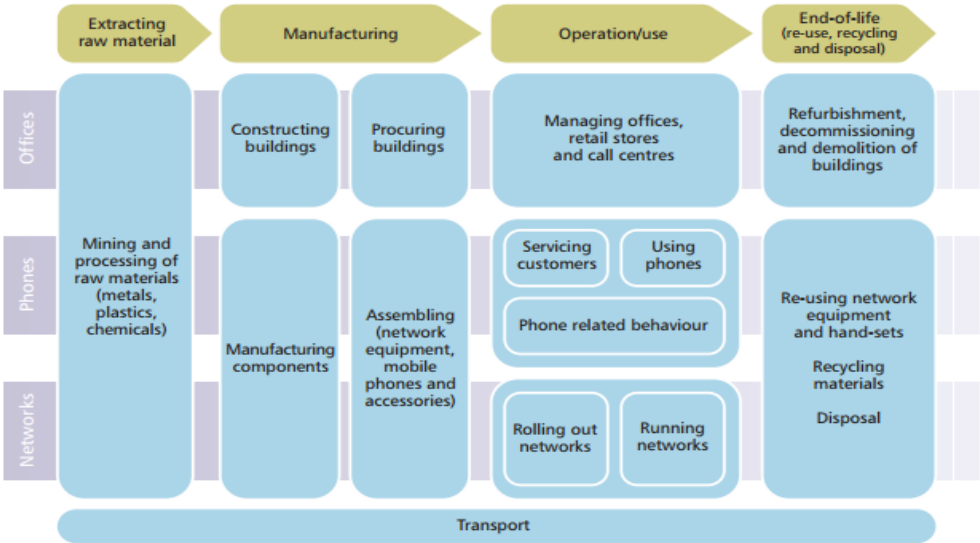


Figure 1: Telecom industry from an environmental perspective (Forum for the Future, 2006)

A problem particularly present in the telecom industry, according to Boons and Lüdeke-Freund (2013), is the locked-in business model which causes a high ecological impact (Figure 2). This high ecological impact is partly due to the marketing of mobile phones as a joint effort of the device producer and the network provider. The hardware in the form of mobile phones is offered by producers, whereas network contracts are offered by the provider. While this business model is feasible for both actors, it leads to a high level of substitution of devices that are still technically functioning. Mobile phones have a high innovation rate and new models are offered rather frequently, creating new trends amongst users. However, this business model leads to disproportionate resource use, including scarce materials. Furthermore, negative social impacts in mining processes occur as resources often originate from conflict areas. This points out that introducing interventions to address sustainable consumption, requires a far-reaching approach to change things at the company level, while taking into account the external barriers imposed by the wider environment of the production and consumption system.

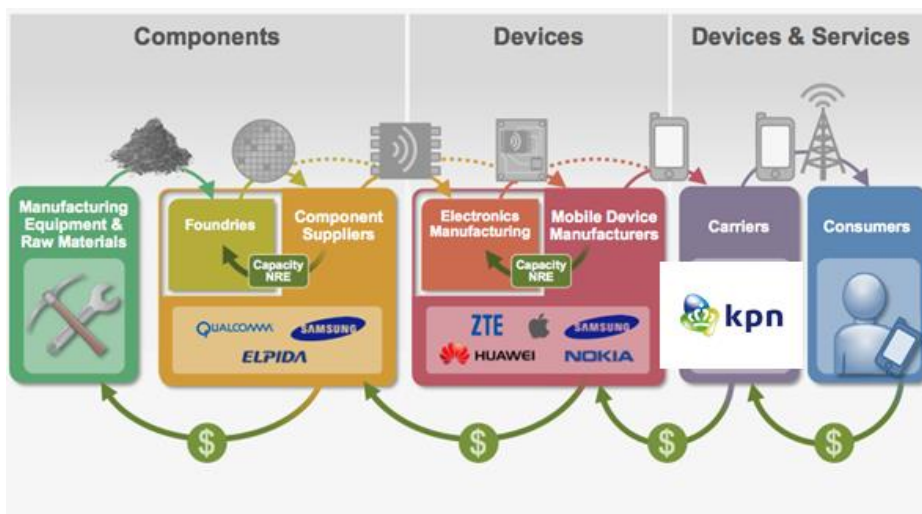


Figure 2: Business model of the telecom industry (ANTH 1102, 2015)

A telecom provider that aims to reduce its environmental impact is KPN, which is the largest telecom network and IT service provider in the Netherlands. The company offers ‘consumer customers’ data broadband services, IPTV services, mobile, and fixed line telephony. For ‘business customers’ the company offers broadband services, mobile, fixed line, and data services. In addition, consultancy, datacentre storage and other network-related ICT solutions are part of KPN’s core business (KPN, 2015a). For this research, only consumer customers of mobile phones were taken into account.

KPN acknowledges that the environmental impact that it causes also includes taking responsibilities for consumers’ purchasing behaviour, energy usage, and the end-of-life treatment of mobile phones. The company intends to make its consumers more aware of the environmental impact associated with using mobile phones and has taken several measures related to intervene in this area. These measures will be more thoroughly described in Chapter 6. This means that the company aims to claim responsibility for societal interests by engaging in, and contributing to sustainable consumption. However, KPN has difficulties in finding the right way to communicate about -and raise awareness for- the above mentioned measures as part of sustainable mobile phone consumption (KPN, 2015b). One of the causes for these difficulties is due to the fact that telecom providers have no direct control in the area of consumer behaviour. As shown in Figure 3, telecom providers such as KPN do have direct control over certain aspects of their environmental impact. Yet, KPN can only

influence, rather than control, consumers' purchasing decisions and mobile phone usage (Forum for the Future, 2006).

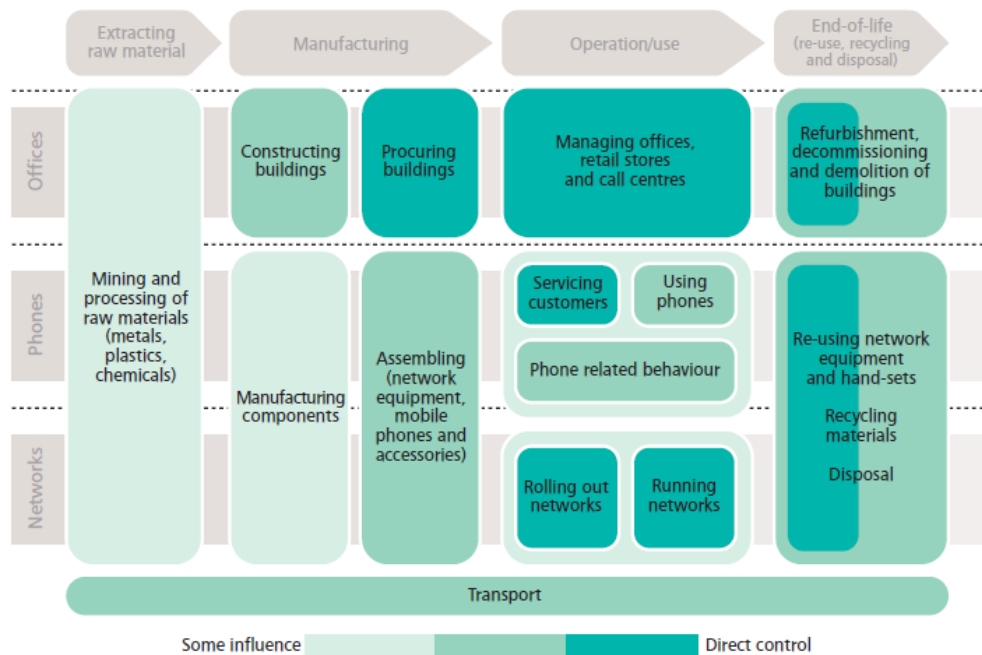


Figure 3: Provider's responsibility: spheres of control and influence (Forum for the Future, 2006)

## 1.2. Knowledge gap

Considering the way in which a company such as KPN can address consumption of mobile phones, it seems appropriate to frame this type of action in terms of self-governance. Driessen et al. (2012, p. 148) define self-governance as “a mode of governance in which the private sector aims to achieve environmental goals through private efforts and investments”, where the focus lies on collective purposes. An example is corporate social responsibility, in which key actors in the business world take greater responsibility in environmental governance, and take the lead in new initiatives that go beyond complying with government regulation. Since 2000, front-running market actors are the initiators of these governance initiatives. KPN's total Dutch market share in the consumer mobile market is 43% (KPN, 2015b). Therefore the company can be seen as market or front-running market actor, when taking the initiative towards a new strategy that goes beyond compliance with regulation and focusses on broader social interests. Furthermore, it can be argued that KPN has the potential to be a first-mover firm within its sector, by applying a strategy in a new context such as sustainable consumption (Lieberman & Montgomery, 1988).

Moreno et al. (2011), point out that there are many approaches and tools that help businesses to integrate sustainability practices into their strategy. However, despite these approaches and the changes that they have accomplished regarding sustainability, there is still a need to address the social and environmental impacts of final consumption. Businesses can play a key role in moving towards sustainability, as they are central to creating technology and wealth; cornerstones of modern society. As such, businesses have the power to influence consumers to consume more sustainably (Mont & Plepys, 2008). Haddock-Fraser and Tourelle (2010) argue that there is limited literature that concentrates on corporate activity in regard to particular environmental management actions and initiatives related to behaviour of consumers. More explicitly, this is also the case for interventions in sustainable consumption of mobile phones by businesses within the telecom sector.

This study therefore aims to contribute to filling the gap of information about how, and to what extent companies can present specific environmental management actions related to sustainable consumption as a form of self-governance (Haddock-Fraser & Tourelle, 2010).

### 1.3. Research objective

This research aims to contribute to scientific literature in two ways. The first aim is to provide a better understanding of consumer behaviour and underlying factors that define sustainable consumption of mobile phones. The second aim is to identify to what extent companies within the mobile phone industry, and particularly KPN as a case study, can intervene in sustainable consumption. These two aims are related because intervention strategies towards sustainable consumption should connect to factors that define consumer behaviour. This enables an intervention strategy that combines the company level with the consumer level. The research objective is both theory- and practice-oriented, and focusses on two features of sustainable consumption as described in the introduction:

- Determinants of sustainable consumption regarding purchasing- and user behaviour of consumers focused on mobile phones;
- Interventions by companies on sustainable consumption as a form of self-governance with regard to mobile phones, in order to increase the sustainability of the mobile phone industry.

The research objective is therefore formulated as follows:

**To contribute to insights on corporate intervention options for a business strategy on sustainable consumption of mobile phones, and to scientific literature on the role of businesses within the mobile phone industry in stimulating sustainable consumption as a form of self-governance.**

This objective can be achieved by: (1) identifying the consumer behaviour to be changed, by examining the factors underlying and explaining this behaviour; (2) discovering which intervention options are relevant for corporate interventions towards sustainable consumption and applying these factors to a business strategy for KPN.

### 1.4. Research question

Following the research objective, the central question to be answered in this study is formulated:

**To what extent can KPN strategically intervene in sustainable consumption of mobile phones as a form of self-governance on the basis of factors that determine sustainable consumer behaviour?**

As the central question requires extensive knowledge on the subjects included, a number of sub questions are formulated to structure the information gathering. By means of a literature review, sub questions 1 and 2 will be answered. In addition, in order to answer sub questions 3 and 4, interviews will be conducted with KPN customers and KPN managers. In other words, the first two sub questions are formulated to develop a theoretical assessment framework. The third and fourth sub question are developed to empirically test this theoretical framework.

1. *Which factors that determine sustainable consumer behaviour are addressed in literature?*
2. *Which corporate intervention options in regard to influencing sustainable consumption are addressed in literature?*
3. *What drives KPN consumers during mobile phone consumption?*
4. *Which intervention options for a business strategy towards sustainable consumption can be identified at KPN?*

The sub questions were derived from the central research question, which was derived from the objective according to the methodology of corroborative types of knowledge (Verschuren, Doorewaard, Poper, & Mellion, 2010).

### 1.5. Research framework

The research framework (as shown in Figure 4) depicts the approach for finding answers to the research questions. In the first place, this involves a literature analysis of two bodies of literature. The first body of literature contains literature on consumer behaviour to identify the factors that determine this behaviour and to establish assumptions for sustainable consumption of mobile phones. The second body of literature contains intervention options in the form of business strategies to target sustainable consumption. The strategies that are found in literature will be translated into assumptions to find components for an intervention strategy for sustainable consumption. These two bodies of literature are used and linked to each other, because in order to answer the research question, an intervention strategy should connect to the factors that define the underlying consumer behaviour.

The first empirical part of the research consists of structured interviews with consumers (KPN customers) to examine the assumptions on sustainable consumption of mobile phones that are formulated in the first theoretical section. The second part of the empirical research consists of semi-structured interviews with relevant KPN managers that influence the corporate sustainability strategy and consumer market policy. A content analysis of corporate documents will complement this part of the empirical research to identify which measures in the field of sustainable consumption are currently being applied by KPN. The final part of the empirical research entails an expert panel to gain input on the interview results to further demarcate the concluding business recommendations.

On the basis of this literature- and empirical analysis, the research will lead to a contribution to the body of literature on business interventions towards sustainable consumer behaviour as a form of self-governance in the first place. In the second place, the research will lead to business recommendations for KPN to intervene in the field of sustainable mobile phone consumption.

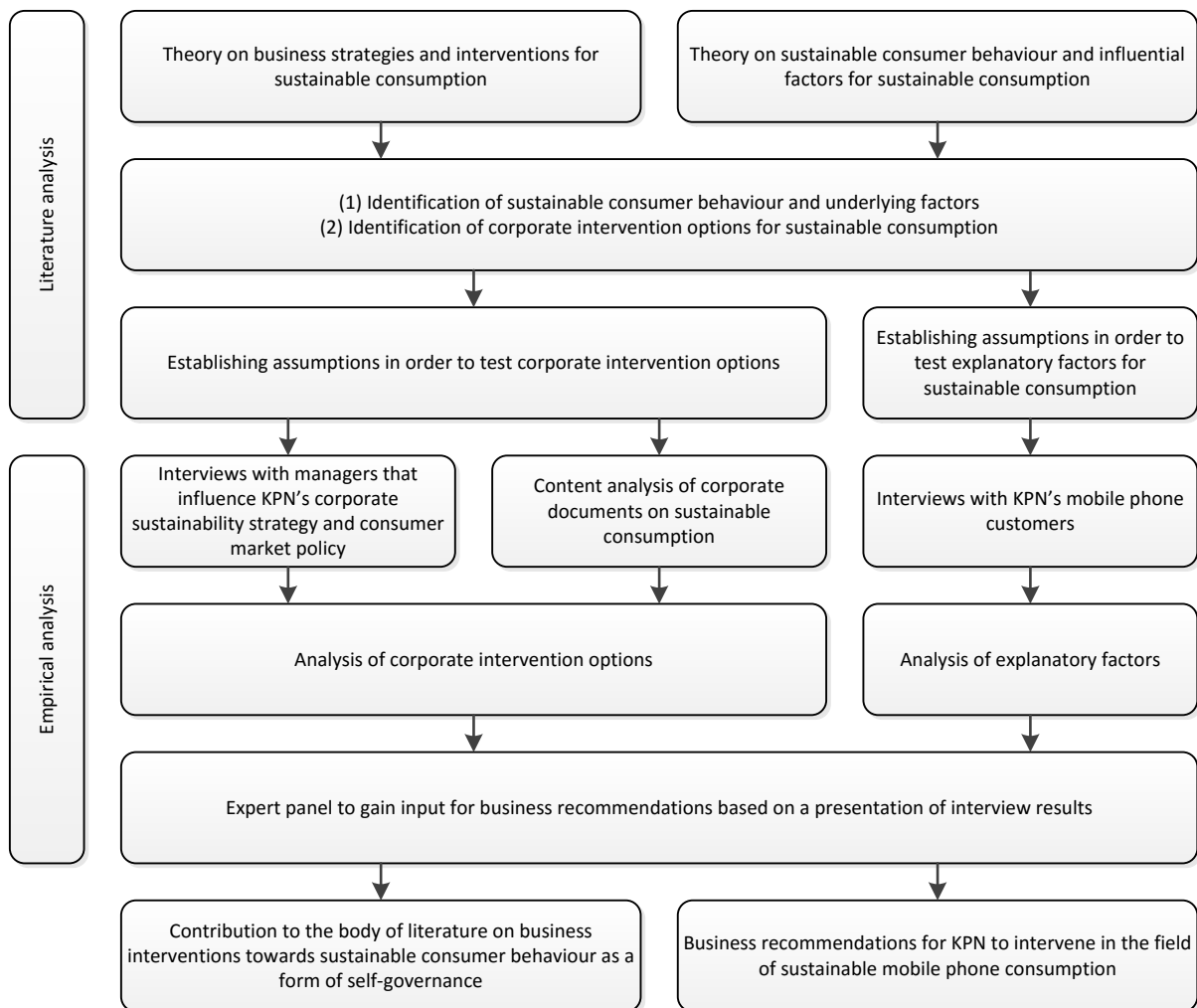


Figure 4: Research framework

## 1.6. Relevance

The role of the business community is gaining attention in the scientific debate about sustainable consumption. However, the body of literature on this topic is still rather limited (Haddock-Fraser & Tourelle, 2010; Michaelis, 2003; Moreno et al., 2011). Companies created the technology and wealth that transformed society in the last two centuries. They provide most of the (private) goods and services that people consume. They invent, design, develop and market products and services, with which they shape market demand and the environmental impact of consumption (Moreno et al., 2011). Businesses are responsible for the creation of a consumer culture where marketable goods are promoted as a means to “satisfy not only material needs, but also needs of social stratification and cultural identification” (Sanne, 2002, p. 282). So far, the majority of environmental strategies and policy instruments have focussed on production-side issues. However, moving towards sustainable development and reducing environmental degradation due to consumption will require setting in place new understandings of consumption-oriented business strategies that can influence people to consume more sustainably (Mont & Plepys, 2008).

This is especially relevant regarding mobile phones, due to the large variety of 29 materials that are processed in smartphones, as is shown in Figure 5 (Compound Interest, 2014). Looking at substitutability, scarcity, and recycling of these materials, the following figures emphasize the need of addressing sustainable consumption of mobile phones:

- 13 out of 29 metals are difficult, if not impossible, to substitute (Figure 6)(Graedel, Harper, Nassar, & Reck, 2015, p. 6298)
- For 8 out of 29 metals the current global extraction is not sustainable, relative to the consumption of those metals in industrialized countries (Figure 7)(Henckens, Driessen, & Worrell, 2014)
- The current recycle rate for 13 out of 29 metals is below 1% (Figure 8)(UNEP, 2011)

This means that a consumption reduction of key materials is necessary, that improvement of product utility and durability is needed, and that the recycling rate has to increase. Therefore, companies in the telecom industry must address upstream, as well as downstream economic, social, and environmental repercussions of their activities in order to reduce waste and increase their value (Press & Arnould, 2009).

Moreover, consumers collectively generate the dominant patterns of financial rewards that shape the economy. By continuing the consumption of products and services that negatively impact our environment, the industrial and corporate actors are not the only ones responsible. Thus, in order to make corporations more sustainability oriented, both the corporate and the consumer level have to be taken into account (Benn, Dunphy, & Griffiths, 2014). Unfortunately, changing behaviours, and in particular towards sustainable behaviour, is far from straightforward. Individual behaviours are embedded in social and institutional structures and contexts. Both the 'rules of the game' of these contexts as well as personal choices are guiding behaviour. People often find themselves 'locked-in' to unsustainable behaviours (Jackson, 2005). In addition, various factors, such as habits, the difference in perceived and actual characteristics of eco-products, and a lack of empowerment, lead to the attitude-behaviour gap. This is the gap between actual behaviour and merely awareness and behavioural intentions, as it is often addressed in behavioural literature (Kollmuss & Agyeman, 2002; Salzmann, Fecht, Steger, & Ionescu-Somers, 2006).

Therefore, it is relevant to develop insights in drivers and constraints for sustainable consumption of mobile phones, to contribute to scientific literature in this field, and to develop an 'evidence-based' strategy for KPN to stimulate sustainable consumption.

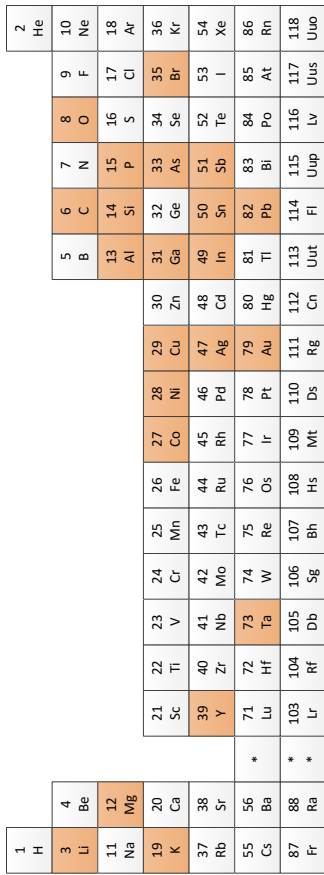


Figure 5: Chemical elements of a smartphone (Compound Interest, 2014)

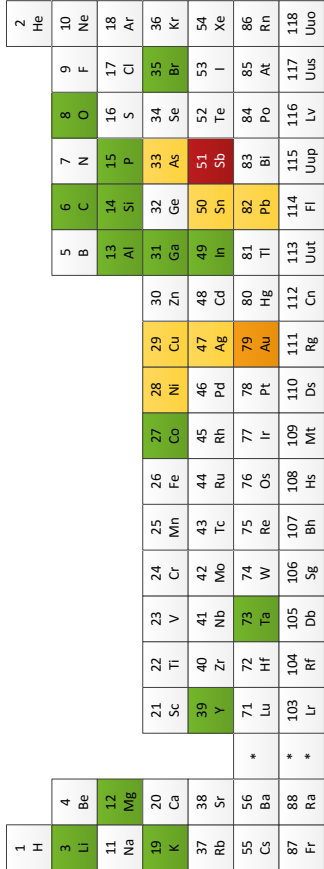


Figure 7: Material scarcity (Henkens et al., 2014)

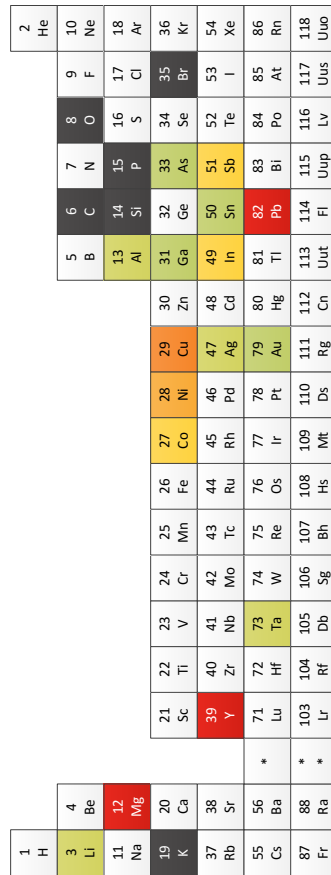


Figure 6: Material substitution performance (Graedel et al., 2015, p. 6298)

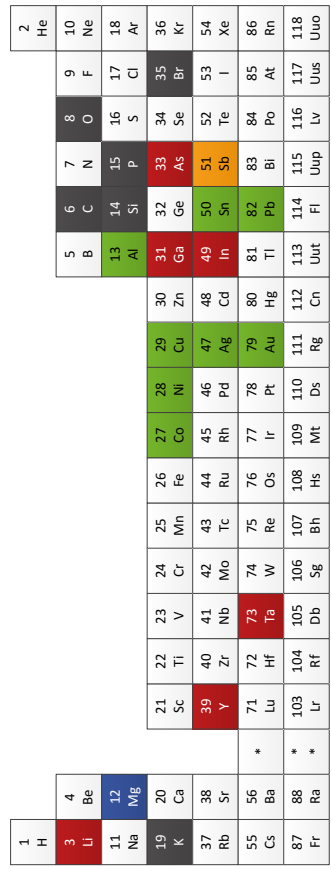


Figure 8: Material recycling rate (UNEP, 2011)



### 1.7. Thesis outline

The thesis is structured as follows (also shown in Figure 9): Chapter 2 presents a theoretical framework containing two bodies of literature: on sustainable consumption, and on corporate interventions towards sustainable consumption. In Chapter 3, the methodology and research strategy are addressed, including an elaboration on the means of data collection, data analysis and quality of the research. Subsequently in Chapter 4, the empirical findings on sustainable consumption regarding KPN's consumers are provided. Chapter 5 presents the empirical findings on the corporate interventions towards sustainable consumption within the context of KPN. Finally, conclusions, business recommendations, and a discussion based on the research results are provided in Chapter 6 and 7.

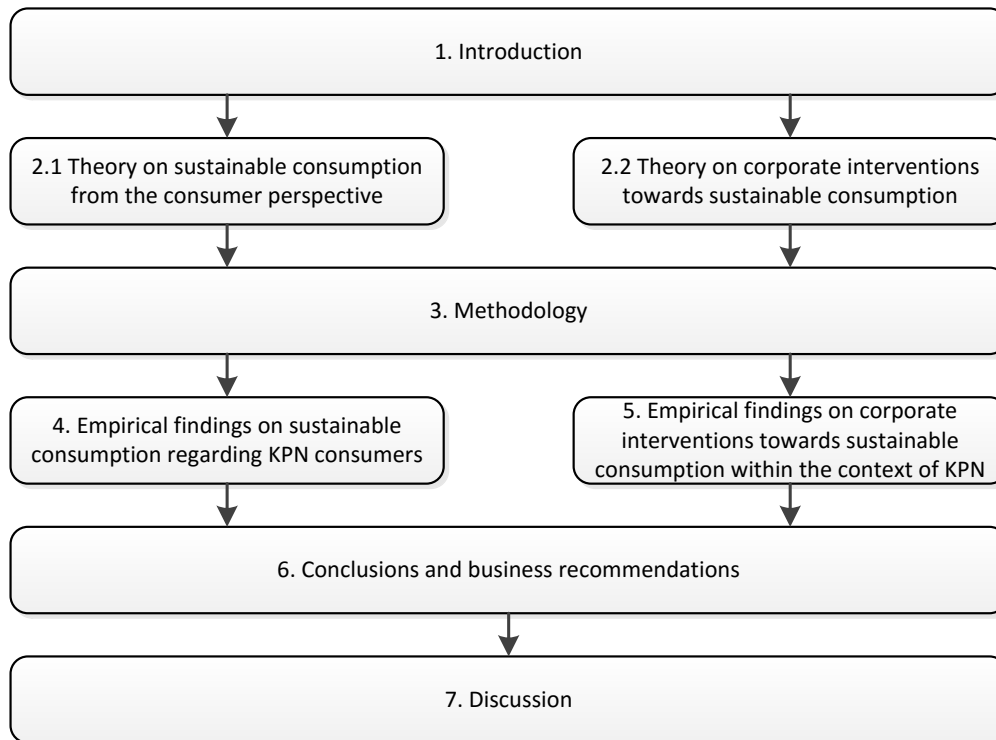


Figure 9: Thesis outline

## 2. Theoretical framework

This theoretical chapter covers a review of two bodies of literature. The first section addresses theory on consumer behaviour, in which factors are identified that determine sustainable consumption. On the basis of these factors, assumptions are formulated to establish what sustainable consumption entails, with a focus on mobile phones. These assumptions will serve as a testing framework for the first empirical part of the research; the consumer interviews. This section answers the first sub question: *which factors that determine sustainable consumer behaviour are addressed in literature?*

The second section covers a literature review on business strategies within the broader context of corporate sustainability. In the first place, to point out that it is relevant to consider sustainable consumption as a form of corporate sustainability. Subsequently, strategies are addressed to target sustainable consumption from a business perspective. These strategies are considered as an assessment framework for the intervention options for KPN. Thus, on the basis of these strategies addressed in literature, assumptions regarding these intervention options will be formulated in the last part of this section. This section answers the second sub question: *Which corporate intervention options in regard to influencing sustainable consumption are addressed in literature?*

The chapter will conclude with a short explanation on how these two bodies of literature are connected in this research.

### 2.1 Theory on consumer behaviour

Many theories address factors that determine consumer behaviour, in which often overlap can be found. The aim of this first part of the theoretical chapter is to select the target behaviour of KPN consumers in the first place, and then to derive factors that promote or constrain sustainable consumption from different theories.

In the end of each section, assumptions regarding sustainable consumption of mobile phones are formulated on the basis of these factors. These assumptions will be tested in the empirical part of the research to examine which factors promote or constrain sustainable consumption according to consumers, and which interventions could be applied towards sustainable consumption in the context of this research.

The approach to select the target behaviour in the first place, then to address the factors that precede this behaviour, and ultimately to find which interventions could be applied to encourage this behaviour follows Geller, Bechtel, and Churchman (2002) and Steg and Vlek (2009). They argue that promoting sustainable consumption is more effective when one: (1) selects the target behaviour for sustainable consumption carefully; (2) examines which factors influence this behaviour; and (3) applies concentrated interventions to address this behaviour and its antecedents. Furthermore, they argue that it is relevant as a final stage to systematically evaluate the effects of these interventions. However, due to the scope of this research and the aim to propose interventions rather than evaluating them within the limited time available, this final stage will not be taken into account.

#### 2.1.1. Target behaviour

To find a selection of relevant factors that influence sustainable consumption, consumer behaviour theories (Faiers, Cook, & Neame, 2007; Vermeir & Verbeke, 2006), and environmental behaviour theories (Jackson, 2005; Stern, 2000) are combined. It is relevant for this research to combine these two schools of behavioural literature because sustainable development implies amongst others an environmental connotation, whereas consumption refers to the behaviour of consumers. Therefore, in the following sections, factors from both behavioural literature schools are applied, and the target

behaviour is referred to as 'sustainable consumption'. The target behaviour is demarcated by KPN consumers of mobile telephones. Sustainable consumption thus refers to: factors that may or may not reflect concerns about the effects of the life cycle of a mobile phone on the natural environment and social values, and that aims to harm the environment and social values as little as possible while buying, using and/or disposing the device (Frederiks, Stenner, & Hobman, 2015; Steg & Vlek, 2009; Wagner, 2003).

Stern (2000) has developed a conceptual framework for sustainable behaviour and has summarized evidence for factors that determine sustainable significant behaviours, and that can effectively change these behaviours. Four general categories of factors are distinguished that affect sustainable behaviour. Moreover, factors mentioned by other authors also fit into Stern's categories, and there are factors that can be subdivided in more than one category (Faiers et al., 2007; Jager, 2000; Vermeir & Verbeke, 2006). Hence, Stern's categories are applied in this chapter as overarching for the factors that are mentioned by other authors. The categories are classified on the basis of:

- Attitudinal factors, which focus mostly on the individual intrinsic causes for specific behaviour.
- Contextual forces, which comprise interpersonal influences, and various features of the broad social, economic, and political context that affect behaviour.
- Personal capabilities concern the knowledge and skills required for particular actions.
- Finally, habit or routine forms a category. Behaviour change often requires breaking old habits and becomes established by creating new habits.

In the following paragraphs, factors will be discussed according to the above mentioned order of categories. Although Stern (2000) argues that attitudinal causes have the highest predictive value for behaviour that is not strongly determined by context, consumer behaviour is especially dependent on contextual forces. Hence, attitudinal factors will be addressed first, and thereafter contextual factors are outlined. Subsequently, personal capabilities are discussed that are, according to Stern (2000), particularly likely to account for more of the variance when behaviour is expensive or difficult. The last paragraph addresses the impact and meaning of habit or routine on consumer behaviour.

### 2.1.2. Attitudinal factors

Attitudinal factors concern among others: norms, values and beliefs. In terms of sustainable behaviour, these factors are related because they indicate whether an individual has a general predisposition to act with sustainable intent, which influences all behaviours considered to be important in terms of sustainability (Stern, 2000). However, sustainable behaviour is also affected by non-sustainable attitudes about attributes of products, or for instance luxury. The following attitudinal factors are identified in theory:

*Personal values* can be seen as relatively stable beliefs about the personal or social desirability of certain behaviours and modes of existence, and can play a significant role in the decision making process of the consumer. They express the goals and needs that motivate people as well appropriate ways on how to attain these goals (Vermeir & Verbeke, 2006). Several consumer behavioural models and theories identify values as factors that influence consumer behaviour (Jackson, 2005; Shaw & Black, 2010).

*Needs* are, according to Faiers et al. (2007), influenced by an individual's values, and also frequently mentioned in behavioural literature. Needs are important for consumer choice because consumers appear to make choices subordinate and relative to their needs. A distinction is thereby often made

between 'needs' versus 'wants'. Individual needs can furthermore be differentiated in needing core goods that are necessary for everyday living, and peripheral goods, which are luxuries and are closer to 'wants'. This differentiation is especially relevant as it is related to an individual's resources in line with the hierarchy of needs. "As choices are related to income, consumers move through the hierarchy of needs and have the capacity and resources to innovate and desire new needs" (Faiers et al., 2007, p. 4384). *Consumer choice* is directed or influenced by principles and insights that are provided in consumer theories. Whereas post-Keynesian Theory assumes that consumers appear to utilise principles that occur in a priority order, Behavioural Economic Theory (BET) advocates that goods are purchased by an individual on the basis of core reasons; e.g. for maintenance, to accumulate, for pleasure, or for accomplishment. Consumer choice is interlinked with needs.

*Motivation* corresponds closely with the concept of needs versus wants. Vermeir and Verbeke (2006) argue that people are motivated to invest more effort in a decision-making process when they are more involved. Motivation is triggered when a product or service is perceived as instrumental when meeting specific needs, goals and values.

*Attitudes* refer to the way an individual views or behaves towards an object, often in an evaluative manner. Attitudes have been identified as a key determinant and an important predictor of environmental and social conscious behaviour. However, it must be taken into consideration that discrepancies exist between an individual's intended and actual behaviour, i.e. the attitude-behaviour gap. Still, environmental concern, political orientation, and in particular 'perceived consumer effectiveness' (PCE) have been proven as causal links to behaviour, and are required to evoke a positive pro-environmental attitude (Faiers et al., 2007; Rex & Baumann, 2007). PCE can be defined as the extent to which the consumer believes that his personal efforts can contribute to the solution of a problem (Vermeir & Verbeke, 2006).

Two assumptions are formulated on the basis of a selection of the above mentioned factors which are expected to influence sustainable behaviour when it comes to consumption in particular. The first assumption concerns the influence of needs versus wants on consumer behaviour. The second assumption concerns the role of attitudes and PCE specifically, as it is expected that these factors indicate whether an individual is intrinsically inclined towards sustainable consumption.

- 1) Consumers who consider their mobile phone as a luxury good, are more willing to take environmental and social impacts of their device into account than consumers who consider their mobile phone as a core good.
- 2) Positive attitudes towards environmental and social issues, and a high PCE leads to more deliberate actions in purchasing and recycling behaviour of mobile phones.

### 2.1.3. Contextual forces

Contextual forces concern amongst others, interpersonal influences, community expectations, (government) regulations, legal and institutional factors, advertisements, monetary incentives, and constraints provided by physical surroundings or technology. In other words, all factors that are imposed by the external circumstances. However, it is notable that contextual forces may have different influences on people with different attitudes or values (Stern, 2000). The following contextual forces are identified in theory:

*Social learning* involves the process of individuals seeking advice from a social network in order to improve their own judgement or to increase their reasoning for a decision. Individuals might use this advice to fill gaps in their own knowledge or to assess the value of alternative options for a decision. Another form of social learning takes place through media. Consumers can, to a certain degree, be

conditioned through media advertising to act in a specific way, or associate particular emotions with a product (Faiers et al., 2007). Wider cultural and societal influences also affect behaviour. Peattie (2010) argues that a collective society with more social interaction will look more readily for solutions to global issues as messages are disseminated faster compared to an individualistic society, which tends more towards materialistic values. Moreover, what is purchased or avoided to purchase, and how particular products are used and disposed can help to construct a social identity and send messages about that identity to others.

The purchase decision process is to a high degree dependent on clear and reliable *information access*. Problems might occur due to the fact that benefits of sustainable products are often poorly communicated, which leads to uninformed purchasing decisions. The degree of information provision as well as the complexity of information influences consumers' certainty in decision making processes. Furthermore, it is important to take into account that sustainability can be seen as a 'credence attribute'. This means that consumers cannot evaluate the effects of their purchase decision personally, but have to put trust in the source that claims sustainability (Vermeir & Verbeke, 2006). One way of providing information is by means of product labelling. Spaargaren and van Koppen (2009) argue, that consumers should be provided with information about the pressure on the environment that is caused by others, in the phases preceding the end-use phase, as well as the impacts after disposal. Current label systems deal with direct and indirect impacts in different ways. From a perspective of consumer agency, communication through ecolabels and other types of product information is not only a matter of conveying information on the product's life cycle impacts. It is also a matter of involving consumers in different phases of the product chain. Consumers have the power to directly change their ways of disposal, use, and access, but also have the power to influence providers through their consumption choices and by providing feedback. In doing so, they can provoke change in all stages of the product chain.

The factor information access can be seen as contextual force, but is dependent on personal capabilities as well as attitudinal factors. On the one hand, information access depends on the information provision by providers of products and is therefore a contextual force. However whether an individual has the right knowledge, and is willing to absorb the information that is provided, depends on its capabilities as well as its attitude towards a product.

Three assumptions are formulated on the basis of the above mentioned factors. The third assumption is based on the factor information access. The fourth assumption concerns communication through product labelling as a means of information provision. Specifically the importance of information about earlier phases of the product development is addressed. The fifth assumption is based on media advertising as a means of social influencing.

- 3) Consumers who believe that they are provided with transparent information about the impact of their consumption choices, will make more environmentally aware choices.
- 4) Consumers that are willing to be involved in earlier phases of the product-chain of mobile phones, are more likely to make conscious purchase decisions.
- 5) Framing the issue through (social) media advertising, contributes to conscious purchase decisions of consumers.

#### 2.1.4. Personal capabilities

The third type of factors are personal capabilities, which include the knowledge and skills that are necessary for specific actions. Examples of personal capabilities are the availability of time and opportunities to act, as well as more general capabilities and resources. Sociodemographic variables such as age, educational attainment, and income might also be indicators for this category.

However, because these variables have limited explanatory power for many significant sustainable behaviours, they will not be taken into account as explanatory factors in this research (Stern, 2000).

Behavioural theories indicate that individuals with either more *knowledge* or *concern* about particular environmental issues generally state a willingness to pay higher prices for alternative products. Individuals will need to analyse products to learn about them. Analysis of a product will require evaluation of both the content and the structure of a product. Whereas content refers to a mental evaluation originating from knowledge of and beliefs about a product, structure defines how the individual cognitively places the product in relationship to other products, goods, or services. Hence, an individual tends to categorise a product, thereby easing their decision to accept or reject it (Faiers et al., 2007). By means of limiting available input to relevant environmental aspects, and by organizing and moderating information, the process can lead to individuals' informed decision making (Faiers et al., 2007; Jackson, 2005). Developing an understanding of an issue, product or service depends on the way people take-in information (Faiers et al., 2007). However, learning about a product's environmental and social impacts means dealing with often complex and perplexing information (Young, Hwang, McDonald, & Oates, 2010).

Behavioural Economic Theory elaborates on a *categorisation of consumers* where four categories of consumers are distinguished on the basis of environmental and cognitive parameters. These four categories are labelled as; initiators, early, and later initiators, and last adopters. It is argued that within these categories, consumers express their type of behaviour along a continuum related to the level of antecedent influences. Examples are personal values, needs, motivation, attitudes, and the level of their learning towards a product. Moreover, consumers' moods or desires can be influenced through communication techniques. Their response, in turn, depends on their level of education related to the product in question (Faiers et al., 2007).

The categorization of consumers that is identified in BET, is compatible with the categorization of individuals that follow the innovation-diffusion process presented by Diffusion Theory. This theory categorizes adopters into five types, based on the time at which they adopt an innovation relative to its launch (Figure 10). These categories are; innovators, early adopters, early majority, late majority, and laggards. Lozano (2006, p. 789) argues that "the combination of the innovators and early adopters provides an idea of the proportion of individuals who could be active in change for the innovation and can serve as sustainable development multipliers, creating the momentum needed to convince the other adopter categories". On the other hand, the late majority and the laggards are the categories that show the highest level of change resistance, but might eventually adopt the innovation after the innovators and early adopters have adopted it. An innovation can thereby refer to a product, a process or an idea.

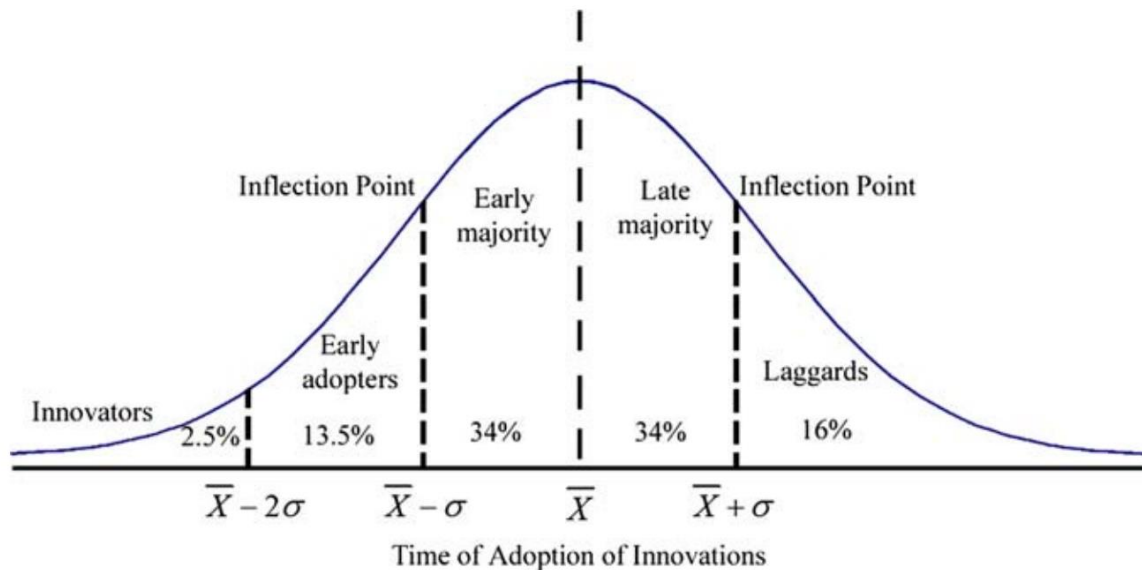


Figure 10: Innovation adopter categorization (Lozano, 2006)

*Behavioural control* refers to the ease or difficulty of obtaining or consuming a specific product. Although a consumer might be motivated to consume (more) sustainably, it may be impossible to turn this motivation into actual behaviour because of low product availability. Perceived consumer effectiveness (PCE) is another aspect that is besides being related to attitudes, also related to behavioural control. PCE specifically requires the individual to trust that others will do their part in achieving an overall goal, including companies and governments (Faiers et al., 2007; Rex & Baumann, 2007).

On the basis of the above mentioned factors, two assumptions related to personal capabilities are formulated. The sixth assumption includes the role of knowledge about sustainability issues related to product assets. The seventh assumption addresses the categorisation of consumers and the difference between these consumer categories in adopting an innovation in line with the innovation diffusion process. Sustainable consumption is thereby considered as a process-oriented innovation.

- 6) Individuals that are willing to learn and gather knowledge about the sustainability assets of the product they purchase, are more willing to consider alternative products.
- 7) Innovators and early adopters must be identified as specific target groups, because strategies that actively address these groups are more likely to succeed in line with the innovation diffusion process.

#### 2.1.5. Habits

As described in previous paragraphs, many theories consider behaviour as a result of considered, cognitive processes. But in practice, many ordinary, everyday behaviours are carried out with very little consciousness and deliberation at all. However, in order to function effectively, habits, routines and other forms of automatic behaviour are crucial (Jackson, 2005). Still, people are often aware of the need to change their behaviour, but their past behavioural routines form a barrier to make an actual change required to update their behaviour (Faiers et al., 2007).

The ability for efficient cognitive processing becomes increasingly important in a message-dense environment, such as the modern society of industrialized countries. At the same time, the process of 'routinization' of everyday behaviours makes individuals less susceptible to rational deliberation,

less obvious to understand, and less accessible to policy intervention. Habitual behaviours often undermine our best intentions to change and are an important structural feature of behavioural 'lock-in'. Lock-in is defined as "consumers' decreased propensity to search and switch after an initial investment, which is determined both by a preference to minimize immediate costs and by an inability to anticipate the impact of future switching costs" (Zauberman, 2003). Habit and lock-in of behaviour are key challenges for behavioural change interventions since many environmentally significant behaviours have this routine character (Jackson, 2005; Stern, 2000). In order to change habits one must 'unfreeze' existing behaviour, to reverse the behaviour from the practical to discursive consciousness (Figure 11). This process is known to be more effective in a supportive, social environment.

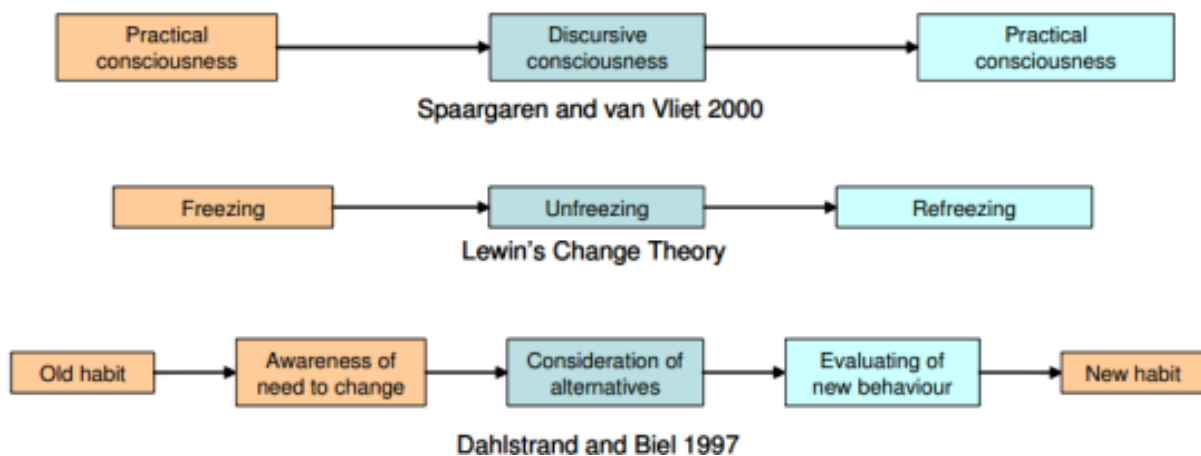


Figure 11: Conceptual perspectives on breaking old habits (Jackson, 2005)

Due to the complexity of changing habitual behaviour as indicated by Jackson (2005) and Faiers et al. (2007), particularly in regard to lock-in of consumers, the following assumption is formulated:

- 8) Habits and consumer 'lock-in', form a barrier to stimulate consumers towards conscious considerations in purchase behaviour.

#### 2.1.6. Conclusion

On the basis of explanatory factors that are identified in literature, eight assumptions were formulated in the previous paragraphs. These assumptions are related to four types of factors (attitudinal factors, contextual forces, personal capabilities, and habits), in order to increase comprehensive understanding on what sustainable consumption determines. The assumptions form the assessment framework to empirically test what is driving KPN consumers during their mobile phone consumption.



## 2.2. Theory on corporate interventions to target sustainable consumption

This section covers a literature review on business strategies towards sustainable consumption. The section begins with an elaboration on corporate sustainability, since it is argued that interventions towards sustainable consumption can be seen as corporate sustainability initiatives. This is done in order to demarcate the broader context of sustainability interventions from the corporate perspective. In the second paragraph, this broad perspective will be further narrowed down by addressing comprehensive business approaches, which businesses can apply to intervene in sustainable consumption. A further demarcation is given in the third paragraph, in which assumptions are formulated on how to address sustainable consumption from the perspective of the mobile phone industry. Thus, this section first outlines the preconditions for corporate interventions in the field of corporate sustainability and second addresses what type of interventions can be used to target sustainable consumption.

### 2.2.1. Corporate sustainability

Corporate sustainability can be defined as: “Corporate actions that proactively seek to contribute to sustainability equilibria, including the economic, environmental, and social dimensions of today, as well as their interrelations within and throughout the time-dimension (i.e. the short-, long-, and longer-term), while addressing the company’s systems as well as its stakeholders” (Lozano, 2015, p. 33). Siebenhüner and Arnold (2007) state that in order to become more sustainability oriented, a company should make changes that include the introduction of resource-efficient technologies, sustainability reporting schemes, and by providing sustainable products, services, and product-service combinations. This is particularly relevant, because it stresses the fact that addressing sustainable consumption as a strategy towards a more sustainability oriented state, can be considered as corporate sustainability initiative, which enables KPN to become more sustainability oriented.

Although numerous corporate sustainability initiatives have emerged, most of these initiatives fall short in capturing the full spectrum of sustainability and its implications of and for corporations. Lozano (2015) argues that companies that have engaged in sustainability, have done so mainly through upper management level initiatives. Yet, companies have been generally treated as ‘black boxes’ in implementing these initiatives, not taking into account subcultures and intra-organisational differences. However, according to Lozano (2015), CS should not merely focus on technology and managerial initiatives, such as changes in processes, products and raw materials, but also on changing corporate culture and attitudes. Cultural change programs require changing the mental models of the organisation’s members, “which takes a long time and requires some luck and skill” (Lozano, 2015, p. 34). Additionally, in order for corporate sustainability change to succeed on the long term, a holistic perspective on change management is required, comprising ‘soft issues’ such as mental models, the organizational structure, and proposals on how to achieve these changes. Therefore, it is assumed that:

- 1) A change of business culture is required to implant the concept of sustainability within the mental models of employees in order to achieve corporate sustainability goals.

### 2.2.2. Business approaches towards sustainable consumption

The World Business Council for Sustainable Development (2009) stresses that businesses can take a leadership role in stimulating sustainable production and consumption patterns that meet societal needs within ecological limits. Part of this recognition is that business can influence consumers to consume more sustainably, which will depend much on their business strategy. This entails “the way in which a company defines its business and links together the knowledge and relationships,

competencies and customers” (Normann & Ramirez, 1993, p. 65). Business approaches towards sustainable consumption can be grouped into three broad categories (Table 1).

*Table 1: Business approaches (World Business Council for Sustainable Development, 2009)*

<b>Sustainable innovation</b>	Business processes for the development of new and improved products, services, and businesses are shifting to integrate provisions for maximizing societal value and minimizing environmental cost
<b>Choice influencing</b>	The use of marketing and awareness-raising campaigns to enable and encourage consumers to choose and use products more efficiently and sustainably.
<b>Choice editing</b>	The removal of “unsustainable” products and services from the marketplace in partnership with other actors in society

Steg and Vlek (2009) distinguish between antecedent and consequence strategies to target behaviour of consumers. Antecedent strategies have a purpose to change factors that precede behaviour. They can address problem awareness, inform about choice options, and mention the possibility of positive or negative consequences, which is in line with the choice influencing strategies. Consequence strategies focus on changing the consequences following behaviour, which is more in line with choice editing strategies. Another distinction is made between: (1) informational strategies in line with choice influencing, aimed at changing prevalent motivations, perceptions, cognitions, and norms; and (2) structural strategies aimed at changing the circumstances under which behavioural choices are made.

Moreover, providing sustainable consumption opportunities to consumers goes beyond merely offering environmental friendly products, produced in clean production processes. The concept has several dimensions. From a perspective of consumer agency, communication through ecolabels and other types of product information should not only entail conveying information on the product’s life cycle impacts. It is also a matter of involving consumers in different phases of the product chain. In doing so, consumers should be made aware of their impact to directly change their ways of disposal, use, and access (Shaw & Black, 2010; Spaargaren & van Koppen, 2009).

The strategies mentioned above all provide options to solve part of the issues. However, in order for companies to target the all-encompassing complex of sustainable consumption, the following is assumed:

- 2) To target the full spectrum of sustainable consumption, business strategies have to focus on factors preceding purchasing decisions as well as on consequential factors of consumer purchases.

### 2.2.3. Addressing sustainable consumption within the mobile phone industry

From the previous section, it can be concluded that individual companies, and especially large corporations in the field of consumer products, can influence consumption patterns. In relation to the research object it is relevant to mention that mobile phones are more frequently replaced than any other electronic good (Boons & Lüdeke-Freund, 2013). On the other hand, mobile devices have become part of consumers’ lifestyles, an extension of who they are and what they do for work and recreation (Wilhelm, 2012). Therefore it is important that businesses in this sector not only create, but also change the system towards a direction of more sustainable production and consumption.

Only focusing on eco-efficiency however, does not reduce the overall environmental impact of electronic products, because the absolute levels of consumption continue to rise as the innovation

cycle shortens. Therefore, changes in consumer behaviour have to be combined with incentives for manufacturers to design more durable phones Wilhelm (2012). Table 2 provides a variety of strategies that can be used for interventions on mobile phone consumption:

Table 2: Strategies for mobile phone consumption interventions Wilhelm (2012)

Strategies	Examples
Provide options for repair and maintenance by customers	<ul style="list-style-type: none"> <li>• Provide spare parts and manuals</li> <li>• Provide assistance for maintenance</li> </ul>
Provide modular/upgradable phones	<ul style="list-style-type: none"> <li>• Provide software updates</li> <li>• Provide upgrade modules</li> </ul>
Make life extension “cool” & discarding expensive	<ul style="list-style-type: none"> <li>• Luxury product positioning</li> <li>• Financial incentives for recycling</li> </ul>
Sell services rather than products	<ul style="list-style-type: none"> <li>• Guarantee functionality and durability</li> <li>• Address needs rather than selling physical ownership</li> </ul>
Educate individuals about the problem of e-waste	<ul style="list-style-type: none"> <li>• Implement eco-labels</li> <li>• Provide access to data on design life</li> </ul>
Increase value through information networks & secondary markets	<ul style="list-style-type: none"> <li>• Campaigns via social media</li> <li>• Offer trade-in programs</li> </ul>

Considering the level of detail of the strategies in Table 2, these strategies will not be specifically included in the final assumption of this chapter. Rather, the strategies provided above are more generally referred to as technocratic solutions and attitudinal and behavioural shifts.

- 3) Technocratic solutions in the form of alternative, eco-efficient products have to be combined with strategies that encourage attitudinal and behavioural shifts in order to target sustainable consumption within the mobile phone industry.

2.2.4. Conclusion

Three assumptions have been formulated in this section that serve as an assessment framework to empirically test intervention options for KPN towards sustainable consumption.

On the basis of theory on corporate sustainability, broad sustainability interventions were identified leading to the first assumption regarding corporate intervention options. The second assumption more specifically addresses the target for business strategies in terms of sustainable consumption. Subsequently, the third assumption covers an even more specific demarcation, where the focus lies on sustainable consumption interventions explicitly within the mobile phone industry.

2.4. Combining the corporate and the consumer level

To conclude this chapter, the link between the first and the second section will be clarified. The first section addressed theoretical factors that were translated into assumptions that serve as a framework to empirically establish what sustainable consumption determines in terms of mobile phone consumption. The second section covered a theoretical review on how sustainable consumption interventions can be placed within the broader context of corporate sustainability, and how these interventions can be applied by companies. In this section, assumptions were formulated likewise, in order to empirically test KPN’s potential for interventions in sustainable consumption of mobile phones.

In the first section it was emphasized that in order to promote sustainable consumption most effectively, three steps need to be taken: (1) select the target behaviour, (2) examine the factors

that influence this behaviour, and (3) apply concentrated interventions to address this behaviour and its antecedents (Steg & Vlek, 2009). In the first section, the target behaviour is identified, and the factors that influence this behaviour are addressed. In the second section, interventions to address this behaviour are identified. In other words, the relation between the two bodies of literature that constitute this chapter lies within the idea that corporate intervention options towards sustainable consumption have to connect to the factors that determine the underlying consumer behaviour.

### 3. Methodology

This chapter presents the strategy and methodology that guided the research. The steps that were taken in order to be able to answer the central and sub research questions are substantiated. First, the research strategy will be discussed, including arguments for specific choices that were made to carry out this strategy. Second, the means of data collection and related research material is provided, followed by a description of the methods used for data analysis in the third section of this chapter. The final section addresses the quality of this research in terms of internal and external validity and reliability.

#### 3.1. Research strategy

This section addresses the research strategy: “a set of key decisions from which a number of other decisions will follow” (Verschuren et al., 2010, p. 156). The first part of the research strategy consisted of desk research. By means of a literature analysis, explanatory factors for sustainable consumer behaviour were identified. Following this literature review, several assumptions were composed containing factors that might affect sustainable consumption either positively or negatively. Furthermore, the desk research covers a literature review on business strategies in the field of sustainable consumption. This means that two analytical levels are guiding the research: the consumer level and the corporate level.

The empirical part of the research strategy consists of a qualitative case study analysis. A case study is a research strategy often conducted to gain a profound and full insight into one or several objects or processes, confined in time and space (Verschuren et al., 2010). In the first place, the aim is to reveal prerequisites regarding sustainable consumption, consumer motivations, and consumer considerations. In addition, since the company KPN forms the research context within which the consumers and target behaviour are demarcated, the second aim is to investigate how strategies should be defined to approach consumers. Thus, for the objective of this research, the case study strategy applies to gaining insights on consumer behaviour and perspectives of KPN managers, in order to develop a proposal for improving KPN’s business strategy in the field of sustainable consumption. Although the choice for an in-depth small-scale study yields knowledge that can be generalised to a limited extent, it will provide more knowledge to reveal explanatory mechanisms (Verschuren et al., 2010); mechanisms that trigger the process of purchasing, using, and disposing mobile phones.

The study is both exploratory and explanatory in nature. It is exploratory because the aim is to gain understanding on sustainable consumption from two perspectives, namely sustainable consumption in the mobile phone market from a perspective of consumer behaviour and from a perspective of business strategies to influence sustainable consumption. Yet, it is also explanatory because the emphasis is on studying explanatory factors that determine this consumer behaviour in the context of mobile phone consumption (Saunders, Lewis, & Thronhill, 2009).

According to Benn et al. (2014), the sustainability debate is currently framed in three ways. First, at the intellectual level as current unsustainable practices are more and more being documented and people become more aware of the complexity of changing these practices. Second, at the level of corporate action, as corporate actors increasingly focus on approaches for more sustainability oriented organizations that have an impact on issues of social and environmental sustainability (Lozano, 2008). Third, at the level of consumption, as consumers collectively generate the dominant patterns of financial rewards that shape the economy. If consumers carry on purchasing products that undesirably impact the environment, industrial and business actors are not the only ones responsible for the resulting destruction. Hence, in order for corporations to become more

sustainability oriented, the debate must be engaged at these three levels: through creating new ideas and visions, in implementing the organizational changes in the corporate context, as well as through effecting change in consumption patterns. Thus, the aim of the research is to contribute to the intellectual level, by combining the corporate level with the level of consumption.

As Saunders et al. (2009) point out, business research projects can be placed on a continuum on the basis of their purpose and context. One end of the continuum comprises basic research that is undertaken purely to understand the processes of business and management and their outcomes as a result of an academic agenda. The other end of the continuum comprises applied research that only focusses on practical consequences. Research at the latter end is of direct and immediate relevance to managers and addresses issues that they consider as important (Table 3). This research can be placed in between basic and applied research as its purpose serves both sides: (1) to expand knowledge of business interventions in the field of corporate sustainability, as well as (2) to provide insights that will be of practical relevance and value to managers in finding a solution to address sustainable consumption at KPN. Regarding this context, the research is mainly carried out within the business and the choice of topic and objectives is both determined by the researcher as well as through negotiation with the company. Moreover, Saunders et al. (2009) argue that a gap between basic and applied research is perceived by academics and managers, which has consequences for the take up of research findings. In the first place, this thesis can be categorized as basic research. In order to overcome the mentioned gap, thereafter, the research findings will also be translated into usable information for KPN (applied component).

Table 3: Continuum on basic and applied research (Saunders et al., 2009)

<b>Basic research</b>	<b>Applied research</b>
<b>Purpose:</b> <ul style="list-style-type: none"> <li>• Expand knowledge of processes of business and management</li> <li>• Results in universal principles relating to the process and its relationship to outcomes</li> <li>• Findings of significance and value to society in general</li> </ul>	<b>Purpose:</b> <ul style="list-style-type: none"> <li>• Improve understanding of a particular business or management problem</li> <li>• Results in a solution to the problem</li> <li>• New knowledge limited to problem</li> <li>• Findings of practical relevance and value to manager(s) in organization(s)</li> </ul>
<b>Context:</b> <ul style="list-style-type: none"> <li>• Undertaken by people based in universities</li> <li>• Choice of topic and objectives determined by the researcher</li> <li>• Flexible in time scales</li> </ul>	<b>Context:</b> <ul style="list-style-type: none"> <li>• Undertaken by people based in a variety of settings including organizations and universities</li> <li>• Objectives negotiated with originator</li> <li>• Tight time scales</li> </ul>

3.2. Data collection

The research questions will be answered by using several data sources. Thus, data triangulation is applied to ensure that the data that is found is rich, valid and reliable (Table 4) (Saunders et al., 2009). First, desk research is conducted to formulate a theoretical (assessment) framework. Secondly, data that has already been collected by KPN for other purposes is analysed. This data consists of documentary data in the form of KPN’s corporate sustainability reporting and information provided on KPN’s websites. This information provides preliminary knowledge regarding KPN’s current measures to address sustainable consumption. The third source of data emerged from two types of interviews: structured interviews with KPN customers and semi-structured expert interviews

with KPN managers. Interviews are considered appropriate for this study, because they can be used to understand the relationships between factors identified in the theoretical framework, content provided by KPN, and perspectives of the interviewees.

After the interviews are conducted, the last part of the data collection consists of an expert panel. The expert panel is engaged to gain specialised input and opinions on the results and outcomes of the consumer- and manager interviews in order to demarcate the business recommendations. In addition, the expert panel has the purpose to detect whether or not the research findings reflect the right need for advice from the organisational perspective.

Table 4: Overview of data collection material

Research material	Description
Structured interviews with consumers	To examine the assumptions for sustainable consumption formulated in the first section of the theoretical framework, related to measures currently taken by KPN (as identified during document analysis). Consumers are approached in three KPN stores to interview them about their consumption considerations and motivations.
Semi-structured interviews with KPN top-level managers	To examine the assumptions for intervention options as formulated in the second section of the theoretical framework, and to collect information about opportunities for strategy development and opinions about current measures taken by KPN to address sustainable consumption.
Expert Panel with KPN managers and employees	To gain a variety of informed (expert) points of view on the interview results, as input for recommendations or courses of action for KPN.
Document analysis	Including sustainability reporting in the integrated report and information provided on websites, to gain insights in measures currently taken by KPN in the field of sustainable consumption.
Literature	(1) to demarcate a theoretical framework and assumptions based on explanatory factors for sustainable consumer behaviour; (2) to identify business strategies for sustainable consumption as corporate sustainability initiatives
Informal meetings	Informal meetings took place and observations were made during the internship period at KPN. They have not been recorded or documented, but contributed to framing the topic and obtaining knowledge in KPN’s business context and market perspective in the field of <i>consumer mobile</i> .

*Interviews with KPN consumers*

Within three KPN stores, mobile phone customers were approached by using a pre-structured questionnaire (Appendix I). The aim was to approach as much customers as possible. However due to limited time available, this finally resulted in an amount of 40 respondents. There were no selection criteria defined on the basis of demographic variables, it was required though that these customers visited the KPN stores within the context of mobile phone consumption (rather than other products and services provided within the stores). The three stores were selected on the basis of practical considerations (on a short distance of the researcher’s office) and located within different neighbourhoods in The Hague.

Interviews were conducted in three different stores because these stores account for different customers, which increases representativeness of the average KPN customer. The aim of these

interviews was to test assumptions regarding the factors that influence sustainable consumption as identified in the theoretical framework. As Steg and Vlek (2009) point out, the effectiveness of interventions that are focused on behaviour, generally increases when they are aimed at important antecedents (defined as factors) of this behaviour and at removing barriers for change. Therefore, it is important to conduct interviews that contribute to an understanding of the identified factors that either promote or constrain sustainable consumption of mobile phones. The interview questions were based on the assumptions formulated in the theoretical framework.

The interviews were structured in terms of fixed questions and there were limited options for response. This form of interviewing means that the same questions are asked in the same order of every respondent. In other words, these interviews can be described as fixed-item, pre-categorized survey interviews (Weiss, 1995). This form of 'survey interviewing' is chosen for several reasons.

In the first place, Sekaran and Bougie (2013) state that structured interviews are conducted when it is known at the outset what information is needed. The information needed from these interviews, consisted of factors that may or may not determine sustainable consumption, as defined in the theoretical framework. In the second place this form of interviewing was chosen because it is easier and takes less time for respondents to answer this type of questions, rather than open-ended questions. Additionally, the questions had to be answered within a store where customers were not expecting to be approached. Furthermore, this form of interviewing is chosen due the scope of the research. Administering questionnaires to a larger number of individuals is less expensive and consumes less time than open-ended interviews. As the aim of this part of the empirical research was to conduct interviews with as many consumers as possible, it is more convenient to formulate pre-categorized questions rather than open-ended questions. Interviews are conducted in Dutch, due to the fact that the research context and the respondents were Dutch.

#### *Interviews with KPN managers*

Second, semi-structured interviews were conducted with six top-level managers at KPN to gain insights and in-depth knowledge in business processes and internal considerations in the field of corporate sustainability and consumer strategies applied by the company. Additionally, one interview is conducted with one of the co-founders of Fairphone (which is one of the measures identified during document analysis), who is responsible for the cooperation between Fairphone and KPN. The aim for this interview was to gain insights in Fairphone's vision and mission, as well as KPN's current forms of cooperation with Fairphone and possibilities to improve this cooperation. Lozano (2012) states that interviewing top executives or leaders can be a reliable source of knowledge because they play vital roles when companies are planning organisational changes for sustainability. However, problems concerned with interviewing top executives might occur due to limited resources, geographic perspectives or hierarchical bias.

Since the topic of the research is demarcated, a list of questions related to the topic was formulated (Appendix II). The topics that were addressed in the interviews were pre-determined on the basis of the theoretical framework on corporate interventions, and the document analysis on current measures taken by KPN to address sustainable consumption. The emphasis was on the interviewee's perspective with the aim to generate rich and detailed answers. Interviewees at KPN were selected and approached on the basis of their job title (job titles of the interviewees, and the aim for selecting these interviewees are presented Appendix III).

#### *Expert panel*

Seven KPN experts with various fields of expertise were engaged in an expert panel, of whom three were also engaged in the manager interviews (job titles of the experts are presented in Appendix IV).



The expert panel was organized specifically to discuss potential courses of action for business recommendations on the basis of the results of the consumer and manager interviews. A first draft of the results was presented, after which options for recommendations and various courses of action were given in a structured manner (Victorian Government Department of Sustainability and Environment, 2005).

In order to minimize potential bias by also selecting some interviewees for the panel, all interview results (especially the results from manager interviews) were presented anonymously. In addition, discussion of all topics was stimulated in order to gain insights from different points of view.

### 3.3. Data analysis

This section provides an explanation and justification on the way in which the obtained data has been analysed. First, the means of analysis of the consumer interview data will be clarified. Second, the analysis of the manager interview data is substantiated, followed by a brief explanation on the application of the expert panel outcomes.

#### *Structured consumer interviews*

The first step was to enter and summarize the answers from the structured consumer interviews in Microsoft Excel. The structured consumer interviews contained five different types of questions (Appendix I):

- 4 closed questions with one possible answer
- 2 closed questions with multiple possible answers
- 17 closed question with a five-point Likert scale
- 1 Closed question with an ordinal scale
- 3 Open questions

Based on this overview, the answers to each question were visualized (Appendix V). Since the goal of the consumer interviews was to gain a basic understanding of consumer motivations, qualitative analysis in the form of descriptive statistics was applied instead of evaluative statistics (Sekaran & Bougie, 2013). Therefore, the use of Excel was sufficient for analysis and the use of SPSS was considered unnecessary. Finally, in order to obtain answers to the assumptions formulated in the theoretical framework, the answers to multiple questions were combined and/or cross-referenced: e.g. are the same consumers that claim to have a positive attitude towards sustainability also willing to recycle their mobile phone?

#### *Semi-structured manager interviews*

For the analysis of the semi-structured expert interviews, a coding approach on the basis of Grounded Theory is applied. According to Grounded Theory, three different types of coding can be distinguished: open coding, axial coding, and selective coding. Open coding concerns the labelling and categorising of elements that are marked by the data. Open coding thus “fractures” the data into concepts and categories. Axial coding involves the process of putting the data back together in new ways to make connections between a category and its subcategories. Selective coding refers to integrating these categories. Subsequently, a story line is generated, which is a descriptive narrative about the central phenomenon of study (Pandit, 1996). In other words, this storyline becomes the core category. Subsidiary categories adjoin the core category in line with the *paradigm model* (Figure 12). The basic purpose of this model is to enable the researcher to think systematically about the data and to develop connections (Pandit, 1996).

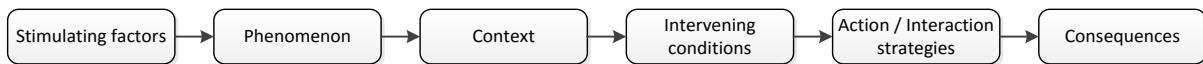


Figure 12: Paradigm model (Pandit, 1996)

The core category is defined as the *phenomenon*, and other categories are consequently related to this category. Causal conditions are distinguished as the events or variables that contribute to the occurrence or development of the phenomenon. However, in this study this element will be referred to as *stimulating factors* to the phenomenon, because causality is hard to establish. The *context* is a set of conditions that influences the action strategies. The *intervening conditions* are similar to the context, however the context is often considered as moderating-, and the *intervening conditions* as mediating variables. The *action strategies* are the (goal-oriented) activities, and responses that agents perform as a result of the phenomenon. The intended or unintended outcomes of these strategies, are referred to as *consequences* (Pandit, 1996).

Thus, the features of this model are used as guideline to develop a storyline on the basis of the interview data that is obtained from the manager interviews. In line with the coding activities described above, categories are distinguished and connected, and subsequently classified according to the six elements of the paradigm model. All coding activities were executed using QSR NVivo.

#### Expert panel

The answers and suggestions given by the experts during the expert panel are written down and related to the empirical findings of the consumer- and manager interviews. In the final sections of the two results chapters (Chapter 4 and 5), the conclusions of the empirical findings are linked to the outcomes of the expert panel. Furthermore, the outcomes of the expert panel are primarily used to test the applicability of the findings and demarcate the business recommendations.

### 3.4. Quality of the research

The methodological literature indicates threats to validity, reliability and forms of bias by applying the case study methodology (Saunders et al., 2009). In terms of construct validity, critics towards case studies refer mainly to the fact that a case study researcher might fail to develop a suitable set of operational measures and that “subjective judgements” are used to collect the data. Threats that have been identified to internal validity refer mainly to dealing with spurious effects. This is mainly a concern for causal case studies where the researcher can make false conclusions on whether event x led to event y. A second concern for internal validity refers to making inferences based on interviews and documentary data, although events were not directly observed. For external validity, threats refer to the fact that conclusions drawn from one particular case study can be hardly generalized to other contexts (Yin, 2003). In terms of reliability, threats include subject or participant error, subject or participant bias, observer error and observer bias (Lozano, 2012). During the research, it has been taken into account that these limitations can affect the outcomes of the results. However, in order to ensure the quality of the research, several case study tactics (shown in Table 5) are considered.

Table 5: Case study tactics for research quality (Yin, 2003, p. 34)

Tests	Case study tactic	Application to research	Phase of research
Construct validity	Use multiple sources of evidence	Triangulation of data collection allows for multiple measures of the same phenomenon. The thesis relied theoretical literature, on semi-structured and structured interviews with various internal and external stakeholders; on content analysis of sustainability reporting and information provided	Data collection

		through websites. The data acquired from multiple sources also forms the basis for the research conclusions, as findings from the theoretical literature, the content analysis and the interviews can be compared to each other in order to answer the central research question.	
Internal validity	Do explanation-building	“To ‘explain’ a phenomenon is to stipulate a presumed set of causal links about it”. By means of applying Grounded Theory a presumed set of stimulating factors was established in a narrative form. These factors to a certain degree reflect theoretical propositions and elements found in documentary data.	Data analysis
External validity	Use theory in single-case studies	A theoretical framework served to test the findings in order to establish an analytical generalization.	Research design
Reliability	Develop a case study database	In order to create a case study data base, the answers of the respondents of the consumer questionnaires are written down and have been stored; the semi-structured manager interviews have been recorded and written down. In this manner, another researcher can investigate the evidence directly if desired. Editing and rewriting of the case study database was not a main priority, therefore the data can appear rough compared to the content of the report itself.	Data collection

## 4. Findings on sustainable consumption from the KPN consumer perspective

This chapter presents the findings of the consumer interviews. In the first part of the theoretical framework it was described that Stern's (2000) categories of explanatory factors (attitudinal factors, contextual forces, personal capabilities, and habits) are applied as overarching categories that structured the chapter in order to increase comprehensive understanding on what determines sustainable consumption. Hence, in this chapter that covers an empirical examination of the assumptions formulated in the theoretical framework, these categories again serve as overarching categories that determine the chapter structure.

Thus, the sections are structured on the basis of these categories of explanatory factors. In the first place, a descriptive analysis on the outcomes of the assumptions is provided in each section. Thereafter, each section concludes with an explanatory reflection on the findings regarding the overall findings for each category. The final section presents a conclusion on the results and answers to the third sub question: *What drives KPN consumers during mobile phone consumption?*

### 4.1. Demographic information

In this section, the distribution of the (questionnaire) respondents is presented. As argued by Rex and Baumann (2007) and Stern (2000), demographic factors have limited explanatory power for many significant sustainable behaviours. Therefore, the following sections will not address the results in relation to these factors. Nevertheless, these demographics are presented to indicate the distribution of the respondents in terms of gender and age. Figure 13 shows that respondents are equally distributed in terms of gender and age which increases representativeness amongst the answers. Furthermore it is shown that all respondents live in The Hague and surrounding villages, which can be explained because the three stores in which the interviews are conducted are located across different locations in The Hague.

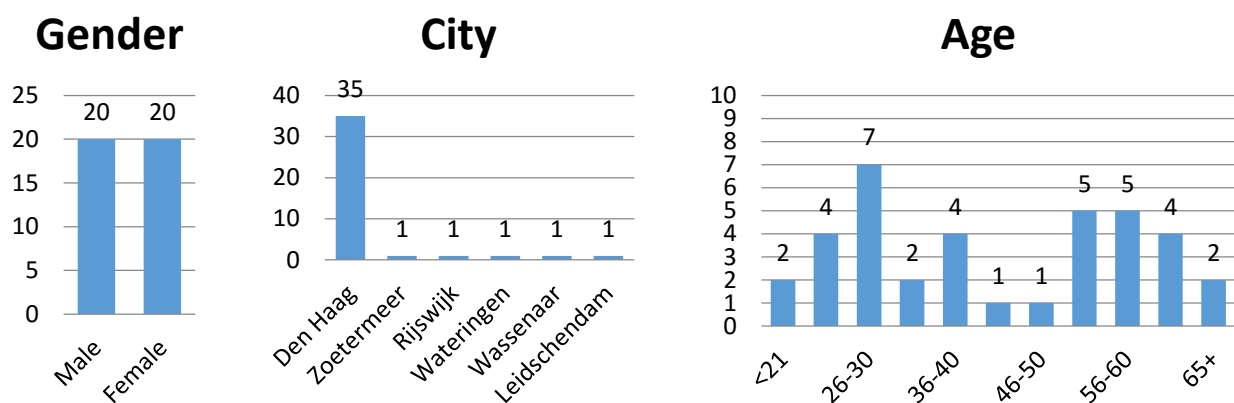


Figure 13: Schematic representation of demographic variables

## 4.2. Assumptions related to attitudinal factors

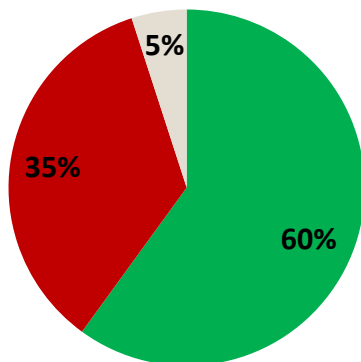
Attitudinal factors are factors that focus mostly on the individual intrinsic causes for specific behaviour (Stern, 2000). The following factors were identified in the theoretical framework attitudinal factors: personal values, needs, consumer choice, motivation and attitudes. The first assumption concerns the influence of needs versus wants on consumer behaviour. The second assumption concerns the role of attitudes and PCE specifically, as it is expected that these factors indicate whether an individual is intrinsically inclined towards sustainable consumption.

### 4.2.1. Assumption 1

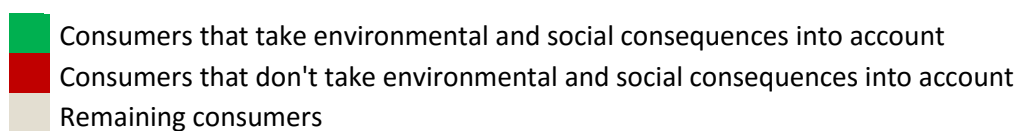
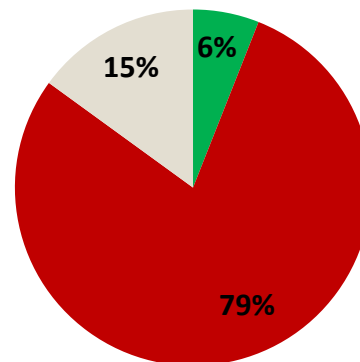
**Consumers who consider their mobile phone as a luxury good, are more willing to take environmental and social impacts of their device into account than consumers who consider their mobile phone as a core good.**

In order to analyse this assumption, the answers to the following questionnaire items have been cross-referenced: (Q7) A mobile phone is a luxury product and not a necessary product; (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; and (Q13) when purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account.

**Consumers that consider their mobile phone a luxury product**  
10 respondents



**Consumers that don't consider their mobile phone a luxury product**  
24 respondents



Respondents without an opinion: 6

Figure 14: Representation of the answers to assumption 1

Figure 14 shows that the amount of respondents who indicated to consider their mobile phone as a luxury product, is considerably smaller than the amount of respondents who indicated that they don't consider their mobile phone as a luxury product. However, following the assumption, the respondents who consider their mobile phone as a luxury product are indeed more willing to take environmental and social consequences of their mobile phone into account. Thus, the assumption can be confirmed.

### 4.2.2. Assumption 2

**Positive attitudes towards environmental and social issues, and a high PCE leads to more deliberate actions in purchasing and recycling behaviour of mobile phones.**

In order to analyse this assumption in regard to recycling, the answers to the following questionnaire items have been cross-referenced: (Q11) By making a conscious choice for a more sustainable mobile phone, I can contribute positively to a more sustainable mobile phone industry; (Q18) I am willing to choose for a specific phone, if I know that this device is more sustainably produced and more sustainable in usage than other phones; (Q10) I am willing to return my old phone for recycling. In regard to purchasing behaviour, the following statements have been cross-referenced: (Q11); (Q18); (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account.

**Consumers with a positive attitude towards sustainability and a high PCE**  
21 respondents

**Consumers with a negative attitude towards sustainability and a low PCE**  
3 respondents

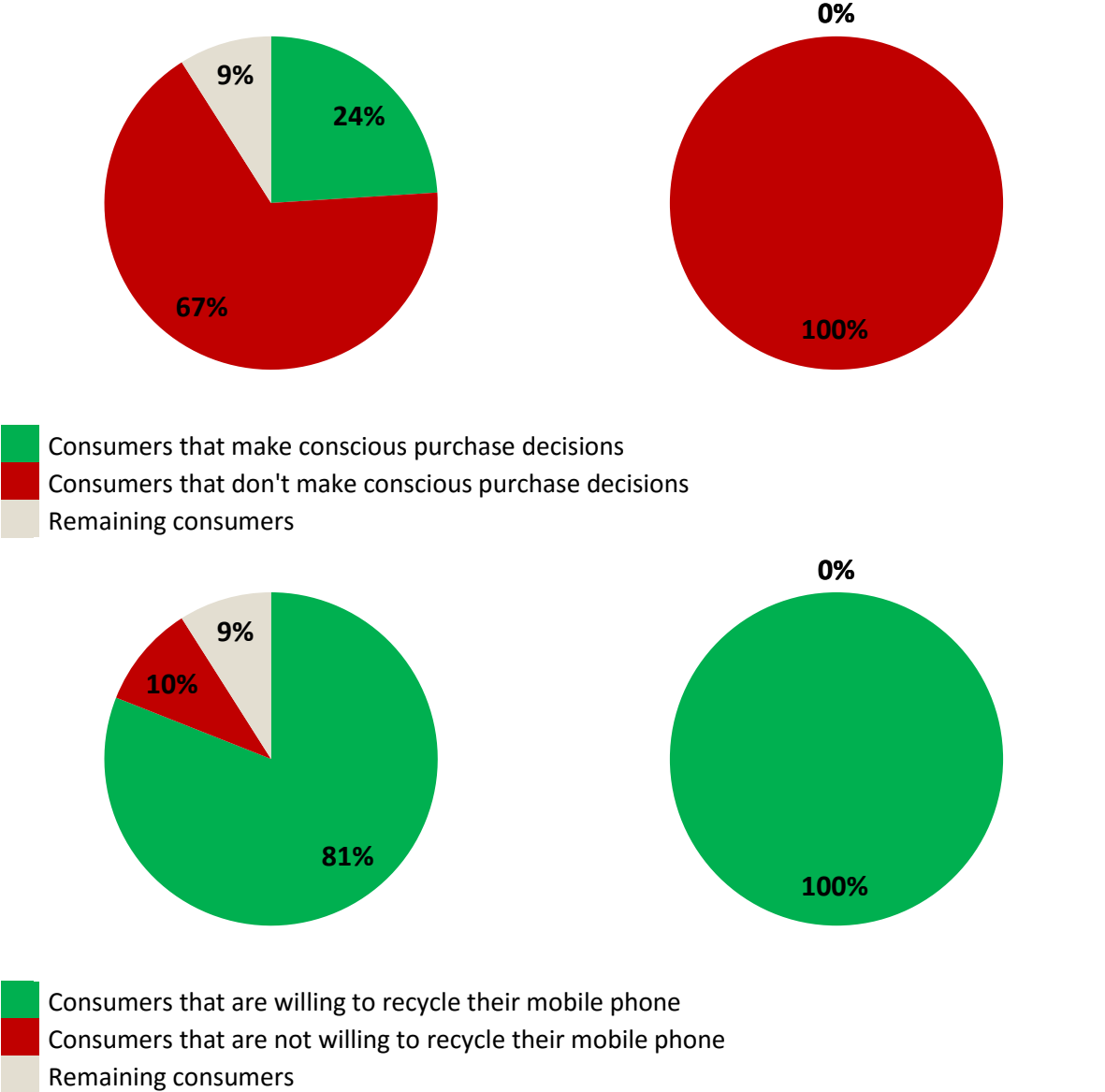


Figure 15: Representation of the answers to assumption 2

As shown in Figure 15, the majority of 67% of the respondents who indicated to have a positive attitude towards sustainability and a high PCE, doesn't make conscious purchase decisions. All

respondents who indicated to have a negative attitude towards sustainability and a low PCE similarly don't make conscious purchase decisions. However, the amount of respondents who indicated to have a negative attitude and a low PCE is considerably small. This means that on the one hand, the assumption in regard to purchase decisions can be rejected. Yet, on the other hand it is hard to actually make a comparison with the respondents who indicated to have a negative attitude towards sustainability and a low PCE as this group accounts only for three respondents.

In regard to recycling, the opposite findings are shown in Figure 15. The majority of 81% of the respondents who indicated to have a positive attitude towards sustainability and a high PCE, is also willing to recycle its mobile phone. At the same time, all the respondents who indicate to have a negative attitude towards sustainability and a low PCE, also indicated to be willing to recycle their mobile phone. Furthermore, it is remarkable that as much as 16 respondents indicated to have no opinion on this issue. However, the assumption in regard to recycling behaviour can be confirmed and is conflicting with the assumption in regard to purchase behaviour.

#### 4.2.3. Reflection on the attitudinal factors

The outcomes of the first assumption showed that a minority of the consumers perceive their mobile phone as a luxury product. This implies that mobile phones can be considered as 'needs' rather than 'wants' for most respondents. Nevertheless, Figure 14 shows that the first assumption can be confirmed. As Faiers et al. (2007) point out, needs are important for consumer choice because consumers appear to make choices subordinate and relative to their needs. This means that as mobile phones are largely perceived as needs, environmental and social consequences of the device are subordinate for most consumers.

Yet, the outcomes of the second assumption illustrated that almost all respondents indicate to have a positive attitude towards sustainability and a high PCE, but they don't actually make conscious purchase decisions which gives evidence to the attitude-behaviour gap (Faiers et al., 2007; Rex & Baumann, 2007). At the same time, most respondents indicate to be willing to return their mobile phones for recycling, including the group of respondents who also indicated to have a negative attitude towards sustainability and a low PCE. This suggests that recycling can be considered as a form of sustainable consumption with a lower barrier to act upon, than adjusting purchase behaviour. However, it must be taken into account that willingness to recycle does not resemble actual recycling behaviour.

### 4.3. Assumptions related to contextual forces

Contextual forces include the interpersonal influences, and various features of the broad social, economic, and political context that affect (sustainable) behaviour. The factors that were identified in the theoretical framework as contextual forces are: social learning, and information access. Three assumptions are formulated on the basis of these factors. The third assumption is based on the factor information access. The fourth assumption concerns communication through product labelling as a means of information provision. Specifically the importance of information about earlier phases of the product development is addressed. The fifth assumption is based on media advertising as a means of social influencing.

#### 4.3.1. Assumption 3

**Consumers who believe that they are provided with transparent information about the impact of their consumption choices, will make more environmentally aware choices.**

In order to analyse this assumption, the answers to the following questionnaire items have been cross-referenced: (Q12) I am provided with transparent information about the sustainability aspects

of mobile phones while making my purchase choice for a specific device; (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device’s life cycle into account.

**Consumers that are provided with transparent information**  
9 respondents

**Consumers that are not provided with transparent information**  
23 respondents

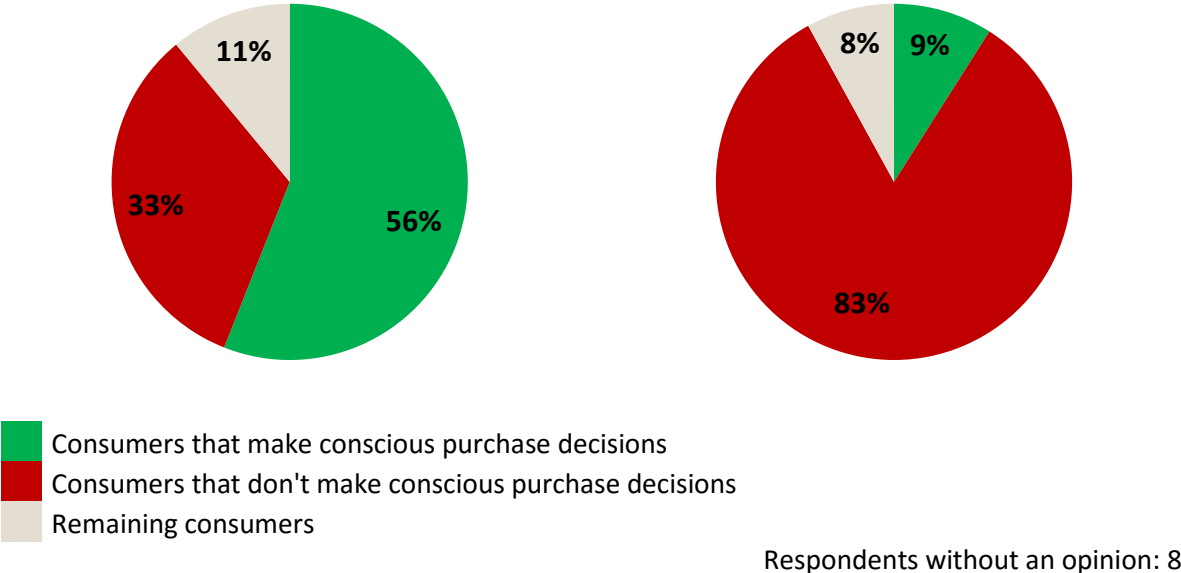


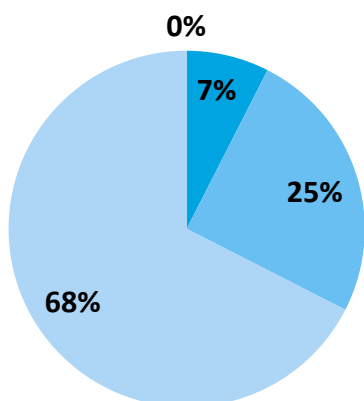
Figure 16: Representation of the answers to assumption 3

The amount of respondents who believe that they are provided with transparent information is much smaller than the amount of respondents who believe that they are not provided with transparent information. Nevertheless, as Figure 16 shows, a majority of 56% of the respondents who believe that they are provided with transparent information, also indicate to make conscious purchase decisions. In contrast, a majority of 83% of the respondents who believe that they are not provided with transparent information, indicate that they don’t make conscious purchase decisions. This means that information provision is not equally perceived by all respondents or information is not distributed equally. Yet, on the other hand, the assumption can be confirmed because the respondents who believe that they are provided with transparent information about the impact of their consumption choice, make more conscious purchase decisions. However, the relation between these two factors is not very strong.

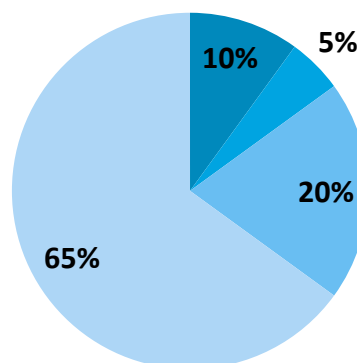
In addition to the questionnaire statements that were cross- referenced and presented in Figure 16, other questionnaire items concerning the familiarity of consumers with Eco-rating and Fairphone (both concepts will be explained in Chapter 5) are also relevant in regard to assumption 1. This is due to the fact that they resemble perceptions of consumers about KPN’s information provision regarding current measures that address sustainable consumption. Therefore, the following questions are represented in Figure 17: (Q3) Are you familiar with Eco-rating; and (Q4) Are you familiar with the Fairphone?



**Familiarity of consumers with Eco-rating**  
40 respondents



**Familiarity of consumers with Fairphone**  
40 respondents



- Familiar and read about it on KPN's website
- Familiar but received information outside of KPN
- Not familiar, but heard about it
- Not familiar, never heard about it

Respondents without an opinion: 0

Figure 17: Representation of the answers regarding familiarity with Eco-rating and Fairphone

Figure 17 shows that a majority of 68% of the respondents indicates that they are not familiar with Eco-rating. 25% indicates to be familiar with Eco-rating, but not through information provided by KPN, whereas no one indicates that they are familiar with Eco-rating through information provided by KPN. Similarly, a majority of 65% of the respondents indicates that they are not familiar with Fairphone. 20% indicates to be familiar with Fairphone, but not through information provided by KPN, whereas 10% indicates to be familiar with Fairphone through information provided by KPN. This means that the majority of the respondents point out that they are not provided with transparent information about the Eco-rating of mobile phones or about the Fairphone.

#### 4.3.2. Assumption 4

**Consumers that are willing to be involved in earlier phases of the product-chain of mobile phones by means of providing feedback, are more likely to make conscious purchase decisions.**

In order to analyse this assumption, the answers to the following questionnaire items have been cross-referenced: (Q15) If I could contribute positively to more sustainable production processes of mobile phones by means of providing feedback, I would do so; (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account.

**Consumers that are willing to provide feedback about production processes**  
28 respondents

**Consumers that are not willing to provide feedback about production processes**  
3 respondents

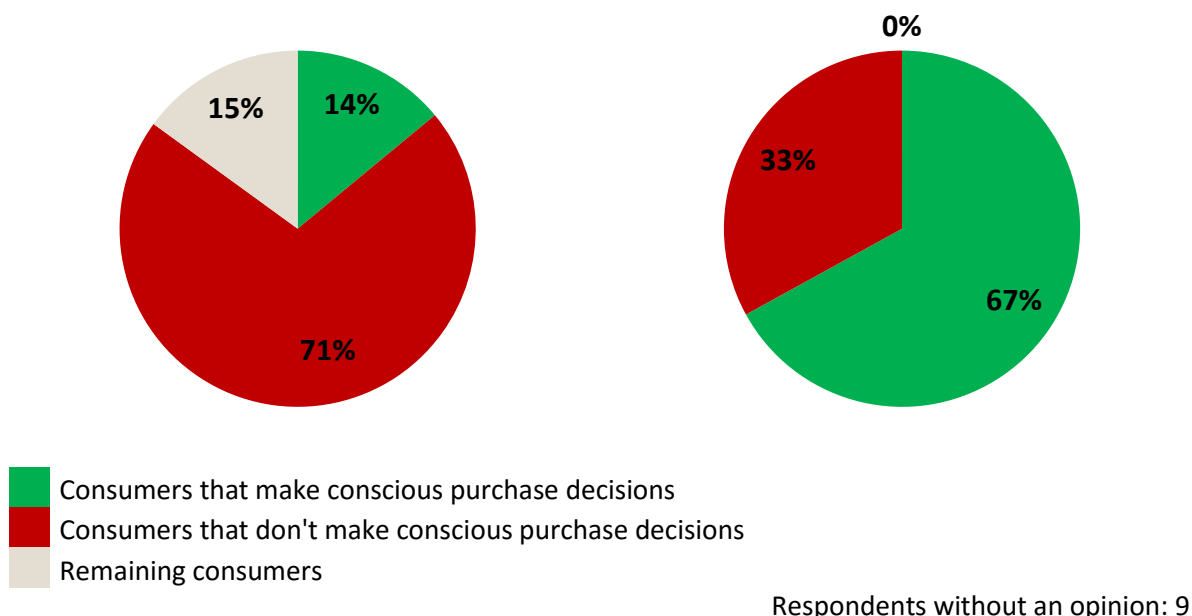


Figure 18: Representation of the answers to assumption 4

The amount of respondents who are willing to provide feedback is considerably higher, than the amount of respondents who are not willing to provide feedback. Also, there is a substantial amount of respondents who don't have an opinion on this item. Figure 18 shows that, of the respondents who indicated that they are willing to provide feedback about production processes, a majority of 71% doesn't make conscious purchase decisions. On the other hand, of the consumers who indicated that they are not willing to provide feedback, a majority of 67% indicates that that they make conscious purchase decisions. This means that consumers who are willing to provide feedback, do not make more conscious purchase decisions which rejects the assumption. However, as the amount of respondents who indicated that they are not willing to provide feedback is considerably small, an actual comparison cannot be made. Yet, it can be concluded that although most respondents are willing to provide feedback, they are not willing to adjust their purchase behaviour. This means that respondents are willing to contribute to a more sustainable mobile phone industry by means of giving their opinion about production processes, yet they are not willing to adjust their actual behaviour. This represents an example of the attitude-behaviour gap.

#### 4.3.3. Assumption 5

**Framing the issue through (social) media advertising and, contributes to conscious purchase decisions of consumers.**

In order to analyse this assumption, the answers to the following questionnaire items have been cross-referenced: (Q14) (Social) media play a significant role in my choice for a mobile phone; (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account.

**Consumers that are influenced by (social) media**  
12 respondents

**Consumers that are not influenced by (social) media**  
15 respondents

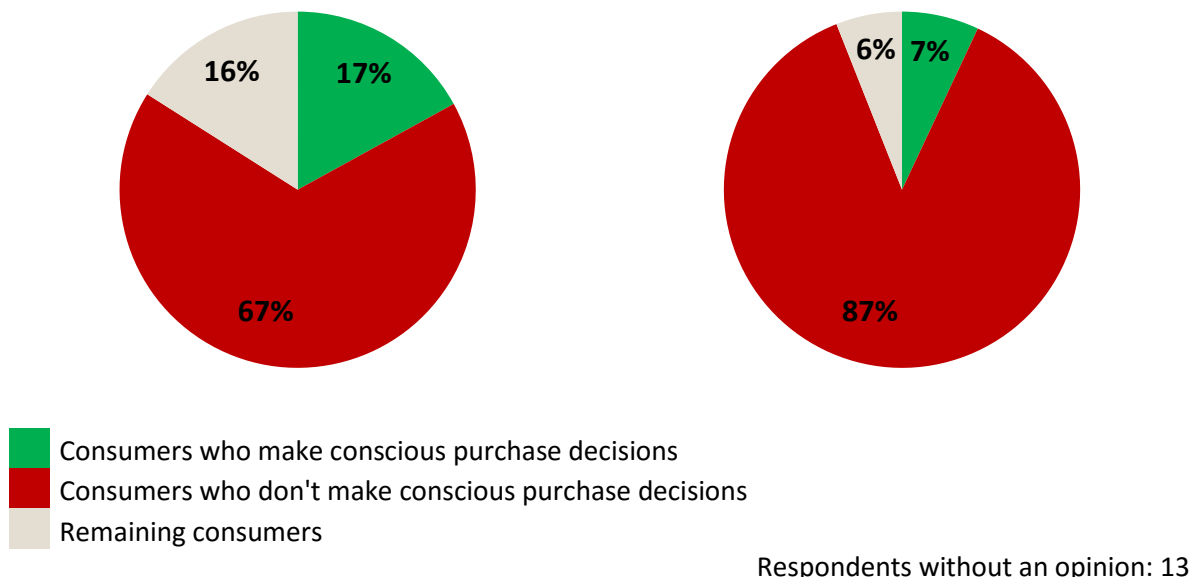


Figure 19: Representation of the answers to assumption 5

The amount of respondents who indicated that their choice for a mobile phone is influenced by (social) media, is slightly smaller than the amount of respondents who indicated that they are not influenced by (social) media in their choice for a mobile phone (Figure 19). Furthermore, it must be noted that a substantial amount of respondents indicated to have no opinion on this issue. Moreover, of the respondents who indicated to be influenced in their choice by (social) media, 67% doesn't make conscious purchase decisions. For the respondents who indicated that they are not influenced in their choice by (social) media, a bigger majority of 87% do not make conscious purchase decisions. Although the amount of respondents who don't make conscious purchase decisions is bigger within the group of respondents that are not influenced by (social) media than within the group of respondents that are influenced by social media, the assumption can be rejected. This means that, generally a small group of respondents indicates indeed to be influenced by (social) media, and within this group there are no indications that more conscious purchase decisions are made.

#### 4.3.4. Reflection on the contextual forces

The amount of respondents who believe that they are provided with transparent information is much smaller than the amount of respondents who believe that they are not provided with transparent information. This means that there are points for improvement in the information provision by KPN, which is also confirmed by the fact that a large majority of the respondents is not familiar with Eco-rating or Fairphone. However, the respondents who indicated that they are provided with transparent information, also indicated to make more conscious purchase decisions. This can be explained due to either differences between consumers in willingness to absorb information, or to differences in information distribution in different stores or within different consumption contexts. Hence, it is relevant for KPN to take a closer look at the degree and distribution of information provision, as well as on the possible complexity of the information about

Eco-rating and Fairphone, as these two features might influence consumers in their decision making process (Vermeir & Verbeke, 2006).

In contrast, the answers to the second assumption showed that consumers are more willing to provide feedback as a means of influencing the product chain, than through their consumption choices to provoke change in all stages of the product chain (Spaargaren & van Koppen, 2009). This points out that, although KPN can focus on improving its strategy of information provision about the sustainability of its products, consumers are to a limited extent willing to change their consumption pattern.

For the analysis of the third assumption, it appeared that using (social) media as a form of social influencing seems irrelevant to stimulate sustainable consumption of mobile phones. Although Faiers et al. (2007) point out that consumers can be conditioned through (social) media advertising to act in a specific way, this does not apply to mobile phone consumption. This is due to the fact that a small group of respondents indicated to be influenced by (social) media in their purchase decisions in the first place, and amongst these respondents there is no evidence for more conscious purchase decisions.

#### 4.4. Assumptions related to personal capabilities

Personal capabilities comprise the knowledge and skills to act in a certain way, the availability of time and opportunities, and more general capabilities and resources of individuals. The following factors were identified in the theoretical framework as personal capabilities: knowledge and willingness to learn, and categorisation of consumers. Two assumptions related to personal capabilities are formulated. The sixth assumption includes the role of knowledge about sustainability issues related to product assets. The seventh assumption addresses the categorisation of consumers and the difference between these consumer categories in adopting an innovation in line with the innovation diffusion process. Sustainable consumption is thereby considered as a process-oriented innovation.

##### 4.4.1. Assumption 6

**Individuals that are willing to learn and gather knowledge about the sustainability assets of the product they purchase, are more willing to consider alternative products.**

In order to analyse this assumption, the following questionnaire items have been cross-referenced: (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account; (Q18) I am willing to choose for a specific device, if I know that this device is more sustainably produced and more sustainable in usage than other mobile phones.

**Consumers that are willing to learn about the sustainability assets of mobile phones**  
6 respondents

**Consumers that are not willing to learn about the sustainability assets of mobile phones**  
25 respondents

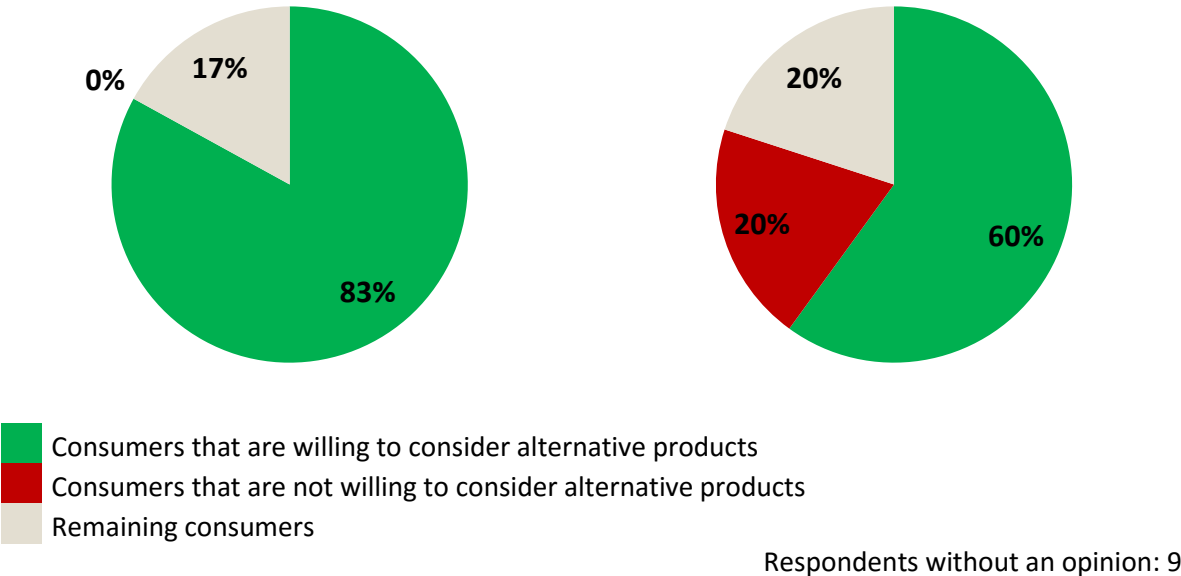


Figure 20: Representation of the answers to assumption 6

As shown in Figure 20, the amount of respondents who point out that they are willing to learn is small compared to the amount of respondents who indicate that they are not willing to learn. Moreover, Figure 20 shows that the consumers who are willing to learn, are also to a higher degree willing to consider alternative products. Yet, of the consumers who indicate that they are not willing to learn, there is still a majority who indicates that they are willing to consider alternative products if they know that this device is more sustainably produced and more sustainably in usage than other mobile phones. This means that, in the first place the assumption can be confirmed considering the difference between the two groups. Although, a majority of all respondents indicate that they are willing to consider alternative products if they know that these products are more sustainable, apart from whether they are willing to learn. Also, as the group of respondents who indicated that they are willing to learn is considerably small, it is difficult to actually confirm or reject the assumption.

4.4.2. Assumption 7

**Innovators and early adopters must be identified as specific target groups, because strategies that actively address these groups are more likely to succeed in line with the innovation diffusion process.**

In order to analyse this assumption, the following questionnaire items have been cross referenced: (Q8) Before purchasing a mobile phone, I inquire about the social impact of the production processes; (Q13) When purchasing a mobile phone, I take the environmental consequences of the device’s life cycle into account; (Q21) When I am convinced of the positive (sustainable) characteristics of a mobile phone, I share these convictions with relatives.

**Strategies targeted at innovators and early adopters**  
6 respondents

**Strategies not targeted at innovators and early adopters**  
25 respondents

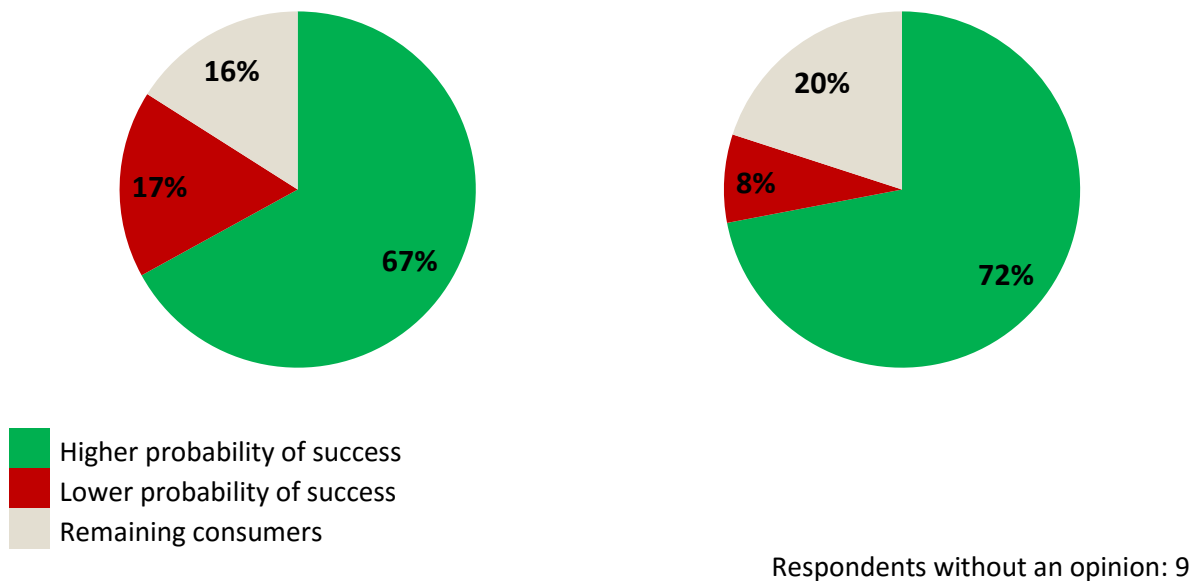


Figure 21: Representation of the answers to assumption 7

As shown in Figure 21, the amount of respondents identified as innovators and early adopters, is considerably smaller than the amount of respondents not identified as innovators and early adopters. This is the same group of respondents that indicated for the first assumption that they are willing to learn. More specifically, the group that is willing to learn about and take sustainability aspects into account, can be seen as the group of innovators and early adopters in the field of sustainable mobile phone consumption. However, Figure 21 shows that if strategies are targeted at innovators and early adopters, they will not have a higher probability of success. In both groups a majority of the respondents indicates that they will share their convictions with relatives. This means that although there is a substantial difference in willingness to adopt sustainability assets of mobile phones, there is no difference in convincing others about these sustainability assets, once they are recognized. Therefore, in terms of the innovation diffusion process, strategies that actively address innovators and early adopters are not more likely to succeed. The assumption can be rejected on the basis of the findings in Figure 21. Yet, as the group of respondents identified as innovators and early adopters is considerably small, the assumption cannot be rejected unambiguously.

#### 4.4.3. Reflection on the personal capabilities

As described in the theoretical framework, individuals will need to analyse products to learn about them. Analysis of a product will require evaluation of both the content and the structure of a product (Faiers et al., 2007). It appeared that the amount of respondents that is willing to learn and gather knowledge about the sustainability assets of mobile phones is considerably small. This might be due to the fact that learning about a product's environmental and social impacts means dealing with often complex and perplexing information (Young et al., 2010). It also appeared that the group that is willing to learn and gather knowledge, is not to a higher degree willing to consider alternative products if they know that these products are sustainable. This implies that willingness to learn does not affect whether respondents will consumer sustainably. However, as the amount of respondents that indicated to be willing to learn is small, the rejection of the first assumption cannot be proved unambiguously.

In the theoretical framework it is stated that “the combination of the innovators and early adopters provides an idea of the proportion of individuals who could be active in change for the innovation and can serve as sustainable development multipliers, creating the momentum needed to convince the other adopter categories” (Lozano, 2006, p. 789). For the second assumption, innovators and early adopters are defined as those consumers who take sustainability aspects into account when purchasing a mobile phone. The innovation is identified as sustainability measures that increase sustainable consumption of mobile phones. However, it appeared that if sustainable consumption strategies would focus on this group, they are not more likely to succeed in terms of convincing relatives, i.e. other adopter categories. Thus, the second assumption can be rejected. Still, as the amount of respondents identified as innovators and early adopters is considerably small, the rejection of the second assumption cannot be proved unambiguously.

4.5. Assumption related to habits

Behaviour change often requires breaking old habits and becomes established by creating new habits. Jackson (2005) points out that habits, routines and other forms of automatic behaviour have a crucial role in the cognitive effort required to function effectively. One assumption is formulated in regard to this factor, particularly concerning lock-in of consumers. This assumption will be analysed in this section.

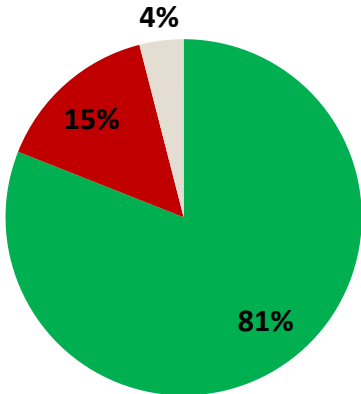
4.5.1. Assumption 8

**Habits and consumer ‘lock-in’ form a barrier to stimulate consumers towards conscious purchase considerations.**

In order to analyse this assumption, the following questionnaire items have been cross-referenced: (Q16) Before purchasing a mobile phone, I always take specifications of multiple devices into account, in order to make a conscious and deliberate choice; (Q20) My choice for a specific mobile phone is based on the choice for my previous/current mobile phone.

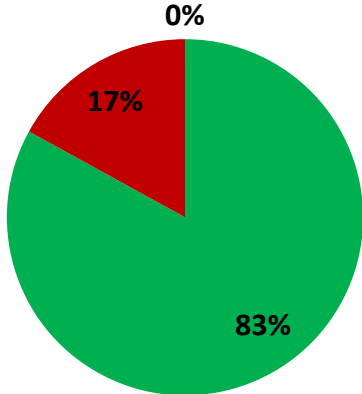
**Consumers who base their purchase on habits**

26 respondents



**Consumers who don't base their purchase on habits**

6 respondents



- Consumers that make conscious purchase decisions
- Consumers that don't make conscious purchase decisions
- Remaining consumers

Respondents without an opinion: 8

Figure 22: Representation of the answers to assumption 8

Figure 22 shows that the respondents have given conflicting answers to whether they base their mobile phone consumption is based on habitual behaviour. On the one hand, a significant majority indicates that their purchase decisions on their choice for their previous mobile phone, which stresses a form of habitual purchase behaviour. On the other hand, this same group also indicates that they take specifications of multiple devices into account to make a conscious and deliberate choice, which stresses a form of conscious purchase behaviour. A considerably smaller group of respondents has indicated that they don't base their mobile phone purchase on the choice for their previous mobile phone, i.e. habitual behaviour. This means that either the respondents have conflicting perceptions about their purchase, or the choice for their previous mobile phone is more important than taking specifications of multiple devices into account to make a conscious choice. Thus, it can be concluded that mobile phone consumption is to a certain degree determined by habits in the form of 'lock-in' in previous choices for specific devices.

#### 4.5.2. Reflection on the role of habits

As stated in the theoretical framework, Stern (2000) and Jackson (2005) point out that habits and lock-in of behaviour are key challenges for strategies that address behavioural change. Since the target behaviour of this study is partly determined by consumer lock-in, it can be confirmed that this factor forms a barrier to stimulate consumers towards conscious (sustainable) purchase decisions of mobile phones. Thus, the assumption can be confirmed.

#### 4.6. Conclusion

The aim of this chapter was to answer the following sub question: *What drives KPN consumers during mobile phone consumption?* The first section pointed out that a substantial majority of the respondents indicated to have a positive attitude towards sustainability and a high PCE. Yet, there seems to be a convincing gap between consumers' explicit attitudes towards sustainability, and actual consumption behaviour. Rex and Baumann (2007) point out that a model often used to explain this gap is Ajzen's Theory of Planned Behaviour. According to this theory, intentions to act in a certain way are, amongst others, determined by attitudes. However, many factors can interfere in between the intention and the act of behaviour. Interfering factors that have an influence on this process include; whether a purchase is perceived as low-cost or high-cost, if the consumer associates the product with earlier behaviours and habits, the consumers' perception on the availability of alternative products, and whether the consumer trusts the environmental information provided.

Furthermore, it was described that there are points for improvement in KPN's information provision and distribution regarding sustainability characteristics of mobile phones. However, the respondents who believe that they are provided with transparent information, also indicated to make more conscious purchase decisions. This means that it is relevant for KPN to take a closer look at the degree of information provision, as well as on the possible complexity of the information provision related to Eco-rating and Fairphone, and possibly other sustainable consumption measures. In doing so, marketing activities have a key role to play. "Marketing activities are involved with both production and consumption: they influence the product portfolio and the communication efforts of the producers" (Rex & Baumann, 2007, p. 568). However, Luchs, Naylor, Irwin, and Raghunathan (2010) argue that increasing product sustainability, and thus marketing actions that focus on sustainability, may not always increase preference. Although people value sustainability, it may not necessarily lead to a preference for sustainable products. This is also stressed by Rex and Baumann (2007), who show that sustainable consumers can be characterized in terms of 'greenness'. They provide a distribution of consumers on the basis their willingness to consume sustainably. Table 6 shows that according to this characterization, Ogilvy and Mather (as stated by Rex and Baumann



(2007)) determined that 16% of consumers can be considered as activists that are actually likely to buy green products and services.

Table 6: Consumer typology by Ogilvy and Mather (Rex & Baumann, 2007)

<b>16%</b>	<b>Activists</b>	Likely to buy green products and services
<b>34%</b>	<b>Realists</b>	Are worried about the environment but sceptical about the green bandwagon
<b>28%</b>	<b>Complacents</b>	See the solution as somebody else’s problem
<b>22%</b>	<b>Alienated</b>	Are unaware of green issues or see them as transient

This implies that technical sustainable information, does not have to be at the centre to appeal the realists, complacents, and alienated consumers to consume (more) sustainably. This is also reflected in the fact that the amount of respondents that is willing to learn and gather knowledge about the sustainability assets of mobile phones is considerably small. In fact, those respondents who are willing to learn have shown that they are not more willing to consider alternative products if they know that these products are sustainable. Thus, the broader group of consumers (that includes the realists, complacents and alienated) will probably not be affected by means of addressing sustainability assets as the most important properties of sustainable products. Instead, in order to affect this group, sustainability can be addressed as one of the appeals among others, of a product (Rex & Baumann, 2007). This is even more relevant as it appeared that if sustainable consumption measures would focus on potential innovators and early adopters, i.e. the sustainable consumers, they are not more likely to succeed in terms of the innovation diffusion process. Additionally, this connects to the input that was gained during the expert panel. It appeared namely, that KPN is explicitly struggling with the most effective way in which sustainability assets should be communicated towards consumers, in order to stimulate them to engage in sustainable consumption (Expert I, II).

Still, a barrier for interventions to effectively address sustainable consumption, appears to be determined by habits and behavioural lock-in. This means that most respondents indicated to “repeat their past behaviour with little regard to current goals and valued outcomes” (Wood & Neal, 2009, p. 579). Generally, habits are relevant to address by means of marketing activities because increases in repeated purchase and consumption are linked with increases in market share of a brand or product (Wood & Neal, 2009). However, as sustainable mobile phone consumption requires a change in consumers’ current behaviour, marketing activities should focus on breaking, rather than retaining habitual behaviour of consumers purchasing mobile phones. Wood and Neal (2009) point out that habits and lock-in can be altered when changes in the purchase context, remove the cues that trigger habitual responding.

## 5. Intervention options towards sustainable consumption

As described in the Methodology, six managers at KPN and one of the co-founders of Fairphone have been interviewed. These interviews were conducted in order to answer the fourth sub question: *Which intervention options for a business strategy towards sustainable consumption can be identified at KPN?* This chapter presents the perspectives of the interviewed managers on (feasible) sustainable consumption interventions and associated measures.

The first section will address three different measures that were identified during a document analysis of KPN content. These measures are considered part of the findings regarding intervention options towards sustainable consumption, and contribute to answering the assumptions on corporate interventions that were formulated in the theoretical framework. Second, the interview findings are discussed according to the six features of Grounded Theory that were identified in the methodology chapter. Hence, section 2 to 6 present the findings accordingly in terms of: *the phenomenon, stimulating factors, context, intervening conditions, action and strategies and consequences*. The final section provides a conclusion in which answers are given to the assumptions, as well as to the fourth sub question. Additionally, potential courses of action that were addressed during the expert panel are provided.

### 5.1. Measures currently applied by KPN

Three different measures that are considered as interventions to address sustainable consumption are identified during the document analysis of (1) KPN's corporate sustainability report in the annual integrated report and of (2) KPN's website. These interventions target the problems that are related to disproportionate resource use, negative social impacts of mining processes, and the problem of e-waste in different ways, and are described in the following paragraphs.

#### *Eco rating*

To better inform its consumers about the sustainability aspects and environmental impacts of mobile phones, KPN introduced Eco-rating in 2014. Eco-rating is developed by Forum for the Future, an independent sustainability (non-profit) organization that works with different organisations across different sectors to develop sustainability strategies. Eco-rating is applied by multiple network operators across the industry to provide a consistent system for assessing sustainability aspects of mobile phones. It provides mobile phones with a standardized score on sustainability aspects. These scores vary between 1 and 5 and are established on the basis of answers to specific questions provided by manufacturers. These questions contain lifecycle issues and material use as well as responsible design issues. The aim is to provide consumers with information to make a responsible consumption choice. In addition, Eco-rating aims to stimulate producers and manufacturers towards a more sustainable production (Forum for the Future, 2015). KPN provides information about Eco-rating to its customers on its website. However, one of the producers with the largest market share on the mobile phone market (Apple) does not cooperate in providing the assessment criteria (KPN, 2015c).

The end-score is composed of a business score and a product score. The business score is based on activities undertaken by manufacturers in terms of sustainability on the social and environmental dimension. The product score displays the social and environmental impact of the device itself. This score is derived of the lifecycle of a mobile phone which includes four phases. Every phase influences the Eco-rating (Table 7). The assessment criteria result in a score between 1 and 5, in which 5 is the highest score (KPN, 2015c).

Table 7: Four phases of the lifecycle of a mobile phone (KPN, 2015c)

Phases	Description
1. <b>Raw material extraction</b>	The less raw materials a device contains, the higher the eco-rating.
2. <b>Production/manufacturing</b>	This phase has the highest impact on the eco-rating. The Co2 emissions and the amount of water used during production are taken into account.
3. <b>Usage</b>	In this phase, energy efficient functions and accessories are taken into account, the energy consumption for dialling and using the internet, and the time it takes to recharge the battery. Also, a mobile phone of which specific components can be replaced when something is broken (modular), scores higher than a phone that has to be replaced as a whole.
4. <b>Recycling</b>	Every supplier takes back devices. Of the importance is the way in which this is done, and whether the recycled materials are being re-used for new devices.

### Fairphone

Fairphone is a mobile phone producer that aims to open up supply chains to understand how things are made, and to connect individuals with the environmental and social impact of their mobile phones. Their phones “serve to uncover production systems, address problems and stimulate discussions about what is truly fair” (Fairphone, 2016). Fairphone started in 2010 as an awareness campaign by three Dutch Ngo’s (Waag Society, Action Aid and Schrijf-Schrijf), to raise awareness about metals that are processed in electronic devices, originating from conflict areas. The campaign and related research activities ran for three years. In 2013, Fairphone was officially established as a social enterprise to expand the reach of their goals. By creating smartphones, they attempt to use commercial strategies with a purpose to maximize social impact at every stage of the value chain, from sourcing and production to distribution and recycling (Fairphone, 2016).

KPN was the first network provider in the Netherlands that offered Fairphone to its customers. KPN supports the initiators of Fairphone with their product development since 2011. Since 2014, KPN has started selling the first Fairphone model, and since 2016 the second model entered the market (KPN, 2016). KPN provides information about Fairphone through its website and through news messages at other online channels. Fairphone focusses on activities and interventions within five core action areas (Table 8).

Table 8: Fairphone's core action areas (Fairphone, 2016)

Core areas	Description
<b>Mining</b>	Source materials that support local economies, not armed militias. They started with conflict-free minerals from the DR Congo.
<b>Design</b>	Focus on longevity, reparability and modularity to extend the phone's usable life and give buyers more control over their products (figure 7)
<b>Manufacturing</b>	Factory workers deserve safe conditions, fair wages and worker representation. Fairphone aims to work closely with manufacturers that want to invest in employee wellbeing.
<b>Life Cycle</b>	Fairphone addresses the full lifespan of mobile phones, including use, reuse and safe recycling.
<b>Social</b>	The mission of Fairphone is to create a new economy with a focus on social

## Entrepreneurship

values. By operating transparently and sharing the Fairphone story, the goal is to help consumers make informed decisions about what they buy.



Figure 23: Fairphone with modular design (KPN, 2016)

### Recycling measures

KPN aims to reduce the use of scarce minerals and the emergence of e-waste by improving the recycling rate and the recyclability of the equipment used for its own operations and by its customers. In the first place, KPN asks suppliers to improve the recyclability of their products as part of their sustainable sourcing program. To recycle user equipment, KPN collected 28% of the mobile phones in 2015 and 62% of the fixed equipment that was exchanged (KPN, 2015b). Customers can return their mobile phones to KPN stores for responsible processing. When returned phones are damaged, but can still be fixed, the device will be refurbished by using particles of other phones. When returned phones are irreparable damaged, KPN sells them to Sims Recycling Solutions, a metal recycling company that processes devices in an environmentally sound manner, along the lines of required certification (KPN, 2014).

### 5.2. Phenomenon

The phenomenon, which is the outcome of interest, of the interviews was established as ‘the implementation of interventions by KPN, in order to target sustainable consumption of mobile phones’. All interviews were conducted to (1) examine the measures and strategies that KPN currently applies, (2) to identify the most appropriate courses of action, and (3) to explore what can or should be done to improve the status quo.

### 5.3. Stimulating factors

From an organisational perspective, three stimulating factors were identified that have an influence on whether a strategy towards sustainable consumption will be implemented or not. To some extent, these factors were also identified in the theoretical framework. The factors listed below will be discussed individually.

- A positive attitude from involved KPN managers and employees towards sustainable consumption measures;
- The presence of a business culture in which sustainability is intertwined;
- A positive fit of sustainable consumption interventions within KPN’s existing sustainability goals.

All interviewees acknowledged the relevance of the research subject had a positive attitude towards sustainable consumption measures: “KPN is in need of such a strategy, because it contributes to the company’s current quest for more sustainability measures that are visible for consumers” (Interviewee III). According to Interviewee II, IV, and V, sustainable consumption interventions can be considered as initiatives to improve the mobile phone market; not for the image of the company, but

because it is necessary that KPN takes a leading role to change the mobile phone market to become more sustainable. This might not directly pay off in the short term, but the company has a duty to act in this field since it will become inevitable on the long term and it is the path in which KPN believes (Interviewee II and V).

However, despite an overall positive attitude of the interviewees, some concerns were expressed as well, specifically regarding the interests in these measures from the consumer perspective: “It is important that our company engages in this topic, however I have some doubts whether our customers are interested in these practices” (Interviewee I). Furthermore, differences in attitudes were noticed in regard to KPN’s information provision towards customers on the existence of the current measures described in the previous section: “I think the information provision on Eco-rating can be improved. It is currently part of the technical specifications of devices, and I think that more information can be provided in stores and on our website” (Interviewee IV). Moreover, this lack of information provision towards consumers can be explained due to the fact that KPN’s corporate sustainability policy has predominantly addressed sustainability of the infrastructure and network operations. In other words, corporate sustainability activities have been directed on upstream activities of KPN’s infrastructure, rather than downstream consumer practices.

The second stimulating factor is identified as the presence of a business culture in which sustainability is intertwined. On the one hand, all interviewees recognized that in order to propagate sustainable practices towards consumers, sustainability has to be intertwined within the business culture. On the other hand, it was also acknowledged that within large companies such as KPN, multiple goals have to be achieved at the same time, which complicates continuous and dedicated attention of all the organisation members towards sustainability issues (Interviewee II). At the same time, it appears particularly complex to bring all departments in line with sustainability related topics, due to conflicting interests and intra-organisational and cultural differences between departments. Not least because there is only a small group of employees throughout the organisation actively engaged in sustainability (Interviewee I). For example, the sales and marketing departments are don’t consider sustainability a priority in setting up campaigns and advertisements (Interviewee I and II).

However, positive examples of an increasing attention towards sustainability issues throughout the company are also noticed: more shareholders pay attention to sustainability goals during shareholder meetings each year, customers ask more questions related to KPN’s sustainability policy through social media, and the Board of Directors speaks more often about sustainability topics and actively addresses them during shareholder meetings (Interviewee II). Yet, in order to entangle sustainability throughout the company, a transition has to occur to engage a broader group of sustainability advocates throughout different departments within the organisation (interviewee I).

Because corporate sustainability goals are set on the mid- and long-term, the third stimulating factor is identified as a positive fit of sustainable consumption interventions within KPN’s existing sustainability goals. KPN’s most important sustainability goal is set for 2025 and entails achieving 100% circular business operations. Therefore it is relevant that new measures in the field of sustainable consumption also contribute to this (and other) long-term goal.

#### 5.4. Context

The collaboration with external actors has been identified as a condition that influences the relation between the phenomenon and the action strategies, i.e. context. Collaboration does not directly influence this relation, but can contribute to the effectiveness of the action strategies, i.e. addressing change towards sustainable consumption at a broader level throughout the mobile phone industry.

It appeared from the interviews that some action strategies are undertaken by KPN, and others are addressed industrywide. Both however, are confined by the limits of legislative frameworks and the rules protecting 'trade secrets'. An example of (external) stakeholder involvement is KPN's annual stakeholder dialogue. During this dialogue, KPN strives to obtain feedback on important themes, e.g. sustainability, that are key to KPN's CSR policy. In order to achieve relevant output, KPN's Board of Directors invites relevant stakeholders from different organisations, such as Ngo's, the scientific community and other businesses (Interviewee II, III, and IV).

In addition, it appeared that there are action strategies that involve cooperation throughout the sector, such as the implementation of Eco-rating (Interviewee VI). Furthermore, there are action strategies that involve cooperation throughout the supply chain, such as the distribution of Fairphone (Interviewee V). Together with other (international) telecom providers, KPN partakes in joint auditing of suppliers: "especially in order to pay attention to sustainability practices of upstream suppliers, cooperation with other network providers (e.g. the Global e-Sustainability Initiative, GeSI) is relevant" (Interviewee III and IV).

### 5.5. Intervening conditions

Two intervening conditions were identified that have a direct influence on the action strategies: (1) external (market) complexities and (2) consumer demand. An important indicator for external (market) complexities is KPN's dependence on established mobile phone manufacturers that have large market shares and can influence consumer demand extensively (Interviewee I, II, III, IV, and V). Because those manufacturers are institutionalised within the market, it becomes difficult for consumers to change towards more sustainable consumption practices. This has a negative (economic) effect on KPN's ability to change its market supply of mobile phones. Another external complexity is that "the innovation and thus replacement of devices depends on software innovations in the form of new applications" (Interviewee IV). In other words, the hardware depends to some extent on developments of software applications for mobile phones. A third complexity, which was mentioned by Interviewee II, is the lack of action taken by governmental actors, as there is no legislative or regulating framework to stimulate sustainability throughout the mobile phone sector. However, at the moment, a market transition has been initiated by the implementation of a new financial control act. This act entails that KPN must (financially) detach contracts and devices that they offer, with the goal that consumers are provided with transparent information regarding the actual prices of devices and contracts instead of all-in prices. This act can contribute positively to the duration of consumers' mobile phone usage (Interviewee I and V).

The second intervening condition, that was identified by all interviewees, is KPN's dependence on consumer demand. For KPN, it is hard to stand out in a market that is about providing connectivity in the form of intangible assets like data and minutes. Therefore, KPN offers mobile phones as a means of providing this connectivity to their consumers. Unfortunately, most consumers choose for devices of the established brands, and only a limited group of consumers actively asks for sustainable devices. In other words, both consumers and KPN are to some extent locked-in to the supply and demand of established mobile phone manufacturers.

### 5.6. Action strategies and consequences

During different phases of the research, intervention options were identified. In terms of Grounded Theory, these intervention options are labelled as actions strategies. Three interventions were identified during the content analysis, and discussed with regard to positive effects and points for improvement: the provision of Eco-rating, offering the Fairphone, and carrying out a recycling programme. A fourth action strategy that is not yet implemented by KPN, is identified during the

interviews: lifetime extension. Besides these strategies, their consequences in terms of positive effects and points for improvement are discussed in this section.

### *Eco-rating*

Even though all interviewees believe that there is no substantial consumer demand for Eco-rating, they do agree that there are points for improvement in the way in which KPN provides information about Eco-rating towards its customers. According to Interviewee I, Eco-rating is “more attractive as a confirmation towards current customers that KPN is involved in sustainability, than it is a means to reach new customers.” Moreover, the most important dilemma concerning the information provision of Eco-rating is whether the target group is large enough in order for KPN to allocate resources to and present it as a USP (Interviewee I). This is emphasized by the fact that the largest mobile phone manufacturer in the market refuses to cooperate with Eco-rating (Interviewee II, III, IV, and V). Thus, however positive the instrument is perceived, success in communicating the environmental and social dimensions of mobile phone production by means of Eco-rating, still depends on the cooperation of all major manufacturers.

Still, the implementation of Eco-rating also has led to positive effects. For example, it is especially used as an instrument for collaboration between network providers in order to demand increased sustainability in upstream supply chain operations. In addition, it is the first instrument/measure that incorporates sustainability impacts throughout the entire life cycle of mobile phones, instead of focussing on one sustainability aspect only, e.g. energy usage (Interviewee IV). Although Eco-rating is one of the few existing tools that can be used to communicate mobile phone sustainability aspects to consumers, those consumers are currently not aware of affected by Eco-rating during their consumption choices.

### *Fairphone*

Proliferating the Fairphone as an alternative product in the market is the most important message that KPN wants to express towards consumers (Interviewee II, III, and V). It is a social project that KPN strives to support and endorse on the long term. However, the small size of the start-up within the established market of large brands is considered problematic to increase sales according to Interviewee II, IV, and V. Also Interviewee VII emphasized that so far, Fairphone did not sell a lot of devices via KPN. “For KPN and across other network operators, we see that it is difficult to accommodate more resources or more space for co-marketing activities with Fairphone, which would boost sales”. This is due to the fact that mobile phone operators get a lot of co-marketing budget from the larger brands. In addition, Fairphone doesn’t have the resources for co-marketing activities (yet), which resembles a clash between using traditional channels and being a start-up (Interviewee VII). Moreover, Interviewee VII acknowledges that it is both necessary and challenging to increase their brand awareness.

Besides the size of the start-up that is considered problematic to increase sales, Interviewee II, IV, and V also point out that it is difficult to differentiate a mobile phone in the market, on the basis of sustainable characteristics and social impact. Therefore, Interviewee VII emphasizes that in order for consumers to change their behaviour and engage with Fairphone, it is important not only to express how sustainable Fairphone is, but also by showing that Fairphone is reliable, that it’s not inconvenient buying a Fairphone, and its modularity that extends the phone’s lifetime by means of reparability. This means that Fairphone would have greater potential in reaching a broader group of interested KPN consumers when other aspects, such as reliability, modularity, and safety would be emphasized.

Another method used to engage consumers with Fairphone is the organization of workshops. During the years that Fairphone started as an awareness campaign, urban mining workshops were organised. Interested consumers were invited through social media and during these workshops, they were given mobile phones from recycling plants with the goal to dismantle them. In doing so, they were taught how mobile phones are made, where the materials originate from, and what the social and environmental issues are (Interviewee VII). In order to increase cooperation with and raise awareness for Fairphone, KPN could start organizing workshops for consumers to extend its potential beyond merely sales.

#### *Recycling*

For some time, KPN offered a lease programme for mobile phones. With this program, consumers did not become owners of the device they purchased, but they had to turn it in by the end of the contract. This programme ensured a high rate of return for mobile phones. Because the lease programme is coming to an end, a new recycling programme is being developed to retain the same level of returned devices (Interviewee VI). However, at the moment it seems to be difficult to stimulate recycling among Dutch consumers, for which three reasons were pointed out: (1) emotional attachment to an old device, (2) a sense of data insecurity, and (3) the fact that consumers like to keep hold of old devices as a back-up for their new device (Interviewee III, V, and VI). Since recycling will become more relevant as some metals that are used for the production of mobile phones become scarcer, the new programme should stimulate recycling with additional measures. For instance, KPN could focus on other incentives such as guaranteed safe data removal (right in front of consumers).

#### *Lifetime extension*

In order to reduce the high level of substitution of devices that are still technically functioning, KPN can stimulate its consumers, e.g. by means of financial incentives, to purchase sim-only contracts and to retain devices when contracts end (Interviewee I and V). This strategy can be supported by further emphasizing the positive effects of modular phones in regard to reparability (Interviewee VII). With both measures combined, KPN can positively contribute to a lifetime extension of consumers' devices.

### 5.7. Conclusion

The aim of this chapter was to answer the following sub question: *Which intervention options for a business strategy towards sustainable consumption can be identified at KPN?*

The previous sections described the outcomes of the document analysis and the expert interviews. However, in order to fully answer this sub question, a concluding link will be made in this section between these empirical findings and the assumptions that were formulated in the theoretical framework. Additionally, outcomes of the expert panel that contributed to answering the assumptions, are added within this section.

The first assumption that was formulated in the theoretical framework on business interventions was:

- 1) A change of business culture is required to implant the concept of sustainability within the mental models of employees in order to achieve corporate sustainability goals.

As described in the theoretical framework, the implementation of sustainable consumption interventions is considered as a corporate sustainability initiative. Additionally, it was stressed that the extent to which interventions are feasible and can be implemented, are dependent on internal drivers for corporate sustainability. The stimulating factors that were identified in the previous



sections, are considered as drivers for corporate sustainability. However, corporate sustainability initiatives often fall short in capturing the full spectrum of sustainability and its implications of and for corporations (Lozano, 2015). These initiatives should not only focus on technocratic and managerial measures, but also on recognising and acting towards cultural change. Cultural change programs require changing the mental models of the organisation’s members.

This seems especially relevant as the presence of a business culture in which sustainability is intertwined, is also identified during the interviews as an important stimulating factor. Currently it is complex to bring all departments at KPN in line towards corporate sustainability, as a consequence of conflicting interests and intra-organisational and cultural differences. Thus, it is relevant for KPN to focus on cultural change in order to improve the feasibility of sustainable consumption measures. A framework that can provide insights in managing “the people side of change” at the individual level is the ADKAR model (Table 9), developed by Hiatt (2006, p. 3).

*Table 9: The ADKAR model (Hiatt, 2006)*

<b>A</b>	Awareness: create awareness of the need for change
<b>D</b>	Desire: create the desire to change, this step remains intangible, and can by definition not be controlled
<b>K</b>	Knowledge: represents <i>how</i> to implement a change, and includes; training and education, detailed information on how to apply the new processes or strategies and tools, understanding of the new roles and responsibilities associated with change
<b>A</b>	Ability: to implement required skills and behaviours, i.e. the demonstrated capability to implement the change and achieve the desired performance level
<b>R</b>	Reinforcement to sustain the change

The second assumption that was formulated in the theoretical framework was:

- 2) To target the full spectrum of sustainable consumption, business strategies have to focus on factors preceding purchasing decisions as well as on consequential factors of consumer purchases.

The measures found in the content analysis that are already being applied by KPN, which were also defined as action strategies during the interviews comprise: influencing purchasing decisions by providing Eco-rating to better inform its consumers about the sustainability aspects and environmental impacts of mobile phones; influencing purchasing decisions by offering sustainable product alternatives in terms of the Fairphone; offering a recycling programme to improve the recycling rate of mobile phones. Whereas the first two measures focus on factors that precede purchase decisions, the latter focusses on the consequences of consumer purchases. Another action strategy that has been identified during the interviews and is not being applied yet, is lifetime extension. This strategy focusses both on factors preceding purchasing decisions as well as on consequences of consumer purchases. Hence, it can be confirmed that KPN has the potential to target the full spectrum of sustainable consumption by applying these strategies, as they focus on both preceding and consequential factors of consumer behaviour.

Still, the results in Chapter 4 show that consumers are barely influenced by the measures that are already being applied. Thus, this means that providing these measures alone will not affect consumers. In order to make these measures feasible for a broader group of consumers, the means of communicating and providing information is essential. However, communicating especially about the sustainability aspects of Fairphone, recycling, or lifetime extension does not necessarily lead to sustainable consumption. In fact, to stimulate sustainable consumption amongst a broader group of

consumers other incentives should be given more attention as also argued by Rex and Baumann (2007). These incentives might include: financial incentives if consumers extend their contract while retaining their device; ensuring safe data removal and financial incentives to stimulate recycling; emphasizing the modularity and reliability of Fairphone, express identifiable messages terms of choice influencing (World Business Council for Sustainable Development, 2009).

On the other hand, in order to reach the smaller group of sustainable consumers, or the activists as emphasized by Rex and Baumann (2007) that do make conscious choices on the basis of sustainability values, Eco-rating and Fairphone can serve as measures that might help KPN to be differently seen by these consumers. This in turn might lead to positive brand affiliation to their sustainability values. Therefore, in order to engage this specific group it is relevant to explicitly communicate and provide information about Eco-rating or Fairphone. Moreover, it was noted during the expert panel that KPN strives to take a leading role in cooperation with other network providers to contribute to awareness and sustainability affiliations of consumers with the telecom sector (Expert IV). In order to take this lead, it is relevant to address the specific group of sustainable consumers.

However, it must be noticed that a substantial barrier that negatively influences the implementation and feasibility of the above mentioned sustainable consumption measures concerns the fact that both consumers and KPN are considered as being locked-in to the supply and demand of established mobile phone producers.

The third assumption that was formulated in the theoretical framework, was:

- 3) Technocratic solutions in the form of alternative, eco-efficient products have to be combined with strategies that encourage attitudinal and behavioural shifts in order to target sustainable consumption within the mobile phone industry.

As argued in the theoretical framework, only focussing on eco-efficiency does not reduce the overall environmental impact of electronic products, because the absolute levels of consumption continue to rise as the innovation cycle shortens (Wilhelm, 2012). Hence, attitudinal and behavioural shifts have to be addressed as well. From the document analysis and during the interviews, it appeared that whereas Eco-rating focusses mainly on attitudinal shifts by means of educating individuals about the environmental impact of mobile phones, Fairphone can be considered as an eco-efficient product. However, Fairphone represents a broader objective of connecting individuals with the environmental and social impact of their mobile phones, which also requires attitudinal shifts. The same goes for recycling and life-time extension which are eco-efficient solutions, but require behavioural shifts to be effectuated. Thus, it is hard to make a clear distinction between eco-efficient products and strategies that encourage environmental and behavioural shift. Rather, it can be concluded that both types of strategies are intertwined in the intervention options for KPN.

## 6. Conclusions

Within this chapter, the conclusions of the master thesis are discussed and business recommendations for KPN are provided. First, the findings regarding the explanatory factors that determine sustainable consumption according to literature and the interviews with KPN customers are presented. Second, corporate intervention options identified in the theoretical framework, KPN documents and expert interviews in regard to influencing sustainable consumption are presented. The findings from these two parts relate to the sub questions that were defined in the introduction of this thesis, which are presented below. In the final part of this chapter, insights that are gained from the answers to these sub questions are combined in order to provide an answer to the central research question.

1. *Which factors that determine sustainable consumer behaviour are addressed in literature?*
2. *Which corporate intervention options in regard to influencing sustainable consumption are addressed in literature?*
3. *What drives KPN consumers during mobile phone consumption?*
4. *Which intervention options for a business strategy towards sustainable consumption can be identified at KPN?*

### *Factors that determine sustainable consumption*

The first and third sub question were formulated to identify the target behaviour, which is the sustainable consumption of mobile phones, and to find explanatory factors that determine this behaviour in literature and within the context of KPN. For the aim of this research, the target behaviour was demarcated by KPN's customers of mobile phones and is referred to as: behaviour that may or may not reflect concerns about the effects of the life cycle of a mobile phone on the natural environment and social values, and that aims to harm the environment and social values as little as possible while buying, using and/or disposing the device (Frederiks et al., 2015; Steg & Vlek, 2009; Wagner, 2003).

Since the list of explanatory factors described by several authors in the behavioural science domain is extensive, the factors have been classified on the basis of four overarching categories distinguished by Stern (2000). Within each category, one or more assumptions were generated (eight in total), which contained a selection of factors and served as a testing framework for the first part of the empirical research, the consumer interviews. Based on the overview below, which presents all assumptions, the main findings will be discussed.

- |                            |   |
|----------------------------|---|
| <i>Attitudinal factors</i> | <ul style="list-style-type: none"><li>• Consumers who consider their mobile phones as a luxury good, are more willing to take environmental and social impacts of their device into account than consumers who consider their mobile phone as a core good.</li><li>• Positive attitudes towards environmental and social issues, and a high PCE leads to more deliberate actions in purchasing and recycling behaviour of mobile phones.</li></ul>  |
| <i>Contextual forces</i>   | <ul style="list-style-type: none"><li>• Consumers who believe that they are provided with transparent information about the impact of their consumption choices, will make more environmentally aware choices.</li><li>• Consumers that are willing to be involved in earlier phases of the product-chain of mobile phones, are more likely to make conscious purchase decisions.</li><li>• Positive attitudes towards environmental and social issues, and a high PCE leads to more deliberate actions in purchasing and recycling behaviour of mobile phones.</li></ul> |

- Personal capabilities*
  - Individuals that are willing to learn and gather knowledge about the sustainability assets of the product they purchase, are more willing to consider alternative products.
  - Innovators and early adopters must be identified as specific target groups, because strategies that actively address these groups are more likely to succeed in line with the innovation diffusion process.
- Habits*
  - Habits and consumer 'lock-in', form a barrier to stimulate consumers towards conscious considerations in purchase behaviour.

The most important promoting factor that was identified, is the consumers' access to information as a contextual force. Consumers who indicated that they receive transparent information about mobile phones, also claimed to make conscious purchase decisions. However, in regard to sustainable consumption, this statement only applies to a small group of activists who already act towards sustainable consumption (in other areas). Based on the results, focusing explicitly on (technical) information concerning sustainability aspects of mobile phones is only applicable to this small group of consumers. Targeting the larger consumer group is more challenging, because they do not act towards sustainable consumption yet.

Although a large percentage of the consumers indicated that they have a positive attitude towards sustainability and a high PCE, this does not necessarily mean they are willing to change. Results show that the attitude-behaviour gap and lock-in of consumers form barriers for sustainable consumption. There seems to be an explicit gap between positive attitudes and the actual consumption behaviour of consumers, as the majority of respondents with positive attitudes indicated that they don't make conscious purchase decisions. This is supported by the fact that mobile phone consumption is mainly determined by habitual behaviour. Hence, in order to affect a behaviour change, cues that trigger habitual responding need to be removed.

#### *Intervention options from the corporate perspective*

The second and fourth sub question were formulated to identify corporate intervention options towards sustainable consumption in literature and within the context of KPN. The theoretical framework was structured by starting from a broad point of view, pointing out that it is appropriate to consider sustainable consumption as a form of corporate sustainability. Subsequently, several strategies to target sustainable consumption were described and narrowed down to specific intervention options within the mobile phone industry. For each contextual level one assumption has been formulated to test the theoretical findings empirically within the context of KPN. The contextual levels are corporate sustainability, general corporate strategies to target sustainable consumption, and specific intervention options within the mobile phone industry respectively:



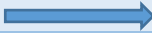


- 1) A change of business culture is required to implant the concept of sustainability within the mental models of employees in order to achieve corporate sustainability goals.
- 2) To target the full spectrum of sustainable consumption, business strategies have to focus on factors preceding purchasing decisions as well as on consequential factors of consumer purchases.
- 3) Technocratic solutions in the form of alternative, eco-efficient products have to be combined with strategies that encourage attitudinal and behavioural shifts in order to target sustainable consumption within the mobile phone industry.

Interventions that KPN currently applies were identified during a document analysis and during expert interviews and comprise: influencing purchasing decisions by providing Eco-rating to better inform consumers about the sustainability aspects and environmental impacts of mobile phones;

influencing purchasing decisions by offering sustainable product alternatives in terms of the Fairphone; offering a recycling programme to improve the recycling rate of mobile phones. Additionally, one intervention option (lifetime extension) that is not yet applied was identified during interviews.

In order to successfully implement the abovementioned interventions, results show that it is relevant for KPN to focus on cultural change to entangle sustainability within the mental models of its employees. This is a prerequisite for employees to spread KPN’s sustainability message: they have to believe in the message themselves in order to express this message towards consumers in a credible manner. There are many models and theories to achieve a cultural change within an organisation. Since analysing all possibilities was not possible within the timeframe of this thesis, one model has been selected as an example: the ADKAR model that is summarized in Table 10. While there might exist models that better suit the organisational environment at KPN, this model fits the topic of addressing sustainable consumption within the broader field of corporate sustainability. By applying the model as an assisting tool, the likelihood that changes are implemented successfully will increase (Hiatt, 2006).

Table 10: Change management tools and assessing results of the ADKAR model (Hiatt, 2006)

Change management tools	ADKAR phases of change	Assessing results
Communications	Awareness 	Employee feedback
Sponsorship	Desire 	Supervisor feedback
Training	Knowledge 	Training feedback
Coaching	Ability 	Performance feedback
Resistance management	Reinforcement 	Audits and Compliance

Secondly, results show that in order to effectuate interventions amongst consumers, the means of communicating and providing information about these measures are essential. Communication strategies that provide information to address sustainable consumption of mobile phones, can be applied by KPN in two different ways. In order to address the majority of consumers who are not likely to consume sustainably by themselves, as a consequence of the intervention options mentioned above, sustainability messages should not be at the centre of communication strategies. This means that, in order to stimulate these consumers to engage with Fairphone, to recycle, or to extend their mobile phone contracts without purchasing a new device, the focus should be mainly on communicating about reliability, safety, or modularity, or to provide financial incentives. On the other hand, in order to engage the small group of sustainable consumers who are already likely to buy green products or services, communicating about sustainability might help KPN to establish brand affiliation with sustainability values. This difference in means of communicating the sustainability message related to the identified intervention options is presented in Table 11. Focussing on sustainable consumers might lead KPN towards a first mover company when it comes to sustainability affiliations of consumers within the telecom sector. Especially as sustainable development by definition implies changes on the long term, and sustainability related problems in the mobile phone sector become more significant due to increasing material scarcity, it is relevant to focus on this group that can be considered as innovators and early adopters of sustainable mobile phone consumption.

Table 11: Targeting different consumer groups for identified measures

Identified measures	Targeting the activists (Sustainable consumers)	Targeting the realists, complacents, or alienated (Non-sustainable consumers)
<b>Lifetime extension</b>	Stimulate consumers to buy sim-only contracts and to retain their devices when contracts end by means of clearly expressing the added sustainability value (unnecessary use of materials while devices are still functioning)	Stimulate consumers to buy sim-only contracts and to retain their devices when contracts end by means of financial incentives: provide discounts on contracts when consumers retain their device
<b>Fairphone</b>	Create more awareness amongst consumers about environmental and social added value of Fairphone. Expand cooperation with Fairphone to engage more consumers, for example by means of organizing workshops in co-operation, engage in Fairphone's social media reach by sharing their messages.	Create awareness of Fairphone by means of communicating explicitly about Fairphone's added value in terms of modularity, its possibility of 2 sims within one device, emphasize on the reliability of the product and its longer operating time.
<b>Eco-rating</b>	Express the meaning of Eco-rating along all the KPN touchpoints: in stores, and on websites Eco-rating should be more prominently reflected.	Expressing Eco-rating towards consumers does not create more willingness towards sustainable consumption. However, focus on cooperation with network providers in order to increase the use of the tool and exert pressure towards upstream suppliers to improve their production chains in terms of sustainability.
<b>Recycling</b>	Stimulate recycling by providing information about the recycling/re-use process, and the added (environmental and social) value of responsible recycling processes	Stimulate recycling by ensuring safe data removal, and by providing financial incentives

Yet, despite these efforts, there is a substantial barrier that negatively influences the implementation and feasibility of the above mentioned sustainable consumption interventions. This barrier concerns the fact that both consumers and KPN are locked-in to the supply and demand of established mobile phone producers. This leads to an essential conclusion regarding the central question of this thesis:

**To what extent can KPN strategically intervene in sustainable consumption of mobile phones as a form of self-governance on the basis of factors that determine sustainable consumer behaviour?**

At the consumer level, especially in regard to the group of sustainable consumers, information provision and specified communication strategies have the potential to influence consumers. However, the attitude-behaviour gap and lock-in are identified as explanatory factors that constrain changes towards sustainable consumption, especially among a broader group of non-sustainable consumers. If consumers carry on purchasing products that undesirably impact the environment, industrial actors cannot fully effectuate sustainability initiatives that are targeting the consumer market. Thus, at the consumer level, KPN can effectuate change amongst a limited group of consumers as a form of self-governance. This change at the consumer-level can be targeted by applying the interventions that are presented in Table 12.

Table 12: Intervention options for KPN towards sustainable consumption (Wilhelm, 2012)

Strategies	Intervention options for KPN
Provide options for repair and maintenance by customers	Provide assistance for maintenance
Provide modular/upgradable phones	Present Fairphone in terms of the communication measures shown in Table 11 (previous table)
Make life extension “cool” & discarding expensive	Provide financial incentives for recycling
Sell services rather than products	Address needs rather than selling physical ownership
Educate individuals about the problem of e-waste	Present Eco-rating in terms of the communication measures shown in Table 11 (previous table) and include the problems of e-waste in the rating system
Increase value through information networks & secondary markets	Develop campaigns via social media and offer trade-in programs

However, in order to accomplish change towards sustainable consumption of mobile phones and to induce this change at a system-level, strategies need to be addressed industry-wide. Yet, by means of self-governance, a system-wide change won't be effectuated by KPN alone. Instead, a more important role in tackling the problem of sustainable consumption has to be claimed by governmental actors. For instance at a European or national level, a regulative framework can be implemented to reduce the high level of substitution of mobile phones amongst consumers and to oblige consumers to recycle their devices.

Thus, from the perspective of self-governance, KPN alone has the ability to initiate a movement towards sustainable consumption by initiating interventions such as Fairphone, Eco-rating, recycling, and lifetime extension. However, when operating solely, KPN cannot enforce a change in the consumption patterns and levels of the majority of its customers. Also, KPN cannot reduce the negative environmental and social effects of mobile phone consumption by themselves. More potential to tackle the negative environmental and social impacts of mobile phone consumption might be reserved for other modes of governance, in which either governmental actors enforce change through regulating frameworks, or different types of actors (governments, companies across the industry, and civil society) cooperatively operate.

## 7. Discussion

This chapter discusses the research findings in order to determine to what extent the obtained results reflect the research objective:

**To contribute to insights on corporate intervention options for a business strategy on sustainable consumption of mobile phones, and to scientific literature on the role of businesses within the mobile phone industry in stimulating sustainable consumption as a form of self-governance.**

In the first place, a better understanding of consumer behaviour and underlying explanatory factors that define sustainable consumption of mobile phones was required. In the second place, insights into the role of companies within the mobile phone industry (KPN in particular), with regard to stimulating sustainable consumption, were necessary. Hence, in order to address the objective, both theory- and practice oriented knowledge had to be derived during this research.

Since the objective is twofold, first, the theoretical implications and research recommendations regarding sustainable consumption of mobile phones are addressed. Second, the theoretical implications and research recommendations on the potential of companies within the mobile phone industry in intervening towards sustainable consumption are discussed. Thereafter, limitations of this research are discussed including a reflection on the methods.

### *Sustainable consumption of mobile phones*

As pointed out in the problem definition of this study, changing behaviour towards sustainable consumption is a complex process due to the extensive amount of factors that influence consumer behaviour and the attitude-behaviour gap (Jackson, 2005; Kollmuss & Agyeman, 2002; Peattie, 2010). Moreover, in order to develop an 'evidence-based' strategy to stimulate sustainable consumption of mobile phones, it is necessary to provide insights in drivers and constraints for this behaviour (Mont & Plepys, 2008). Much has been written about pro-environmental, sustainable, or ethical consumer behaviour (Faiers et al., 2007; Geller et al., 2002; Jackson, 2005; Steg & Vlek, 2009; Stern, 2000). However, this thesis contributed to this existing body of literature by providing insights in promoting and constraining factors for sustainable consumption in the context of mobile phone consumption, by applying four categories of explanatory factors developed by Stern (2000). Moreover, several elements that were found in literature have been established by this study. In the first place the discrepancy between consumers' attitude towards sustainability and their actual behaviour, known as the attitude-behaviour gap that is often addressed in behavioural literature (Kollmuss & Agyeman, 2002; Salzmann et al., 2006), proved to have a significant role in the consumption of mobile phones. Also, it was established that habitual behaviour and 'consumer lock-in' form a barrier for behavioural change (Jackson, 2005; Zauberan, 2003). This confirms that mobile phone consumption is essentially not a result of considered cognitive processes, which makes it more difficult to steer towards sustainable consumption.

However, in order to provide more empirical evidence for actual effects of the potential interventions that were identified in this study, it is recommended to complement this research with a pilot study on the suggested interventions, which might lead to better estimations on how consumers will actually be affected, and to what extent they are restricted to change due to habitual behaviour. Throughout this research, guiding principles developed by Steg and Vlek (2009) were followed. It was argued that promoting sustainable consumption is more effective when one: (1) selects the target behaviour for sustainable consumption; (2) examines which factors influence this behaviour; and (3) applies concentrated interventions to address this behaviour and its antecedents. Yet, the final step of these guiding principles comprises a systematic evaluation of the effects of



these interventions. This step is not taken into account and can therefore be studied as a follow up to this research.

#### *The role of companies within the mobile phone industry in stimulating sustainable consumption*

As indicated in the introduction of this thesis, several authors stress that businesses can play a key role in moving towards sustainability as the central actors of wealth and technology creation (Mont & Plepys, 2008; Moreno et al., 2011; Spaargaren & van Koppen, 2009). This study has shown that for businesses, and particularly within the mobile phone industry, it is indeed relevant to focus on consumer behaviour and to reduce environmental impacts of current consumption patterns due to: the materials that are processed in mobile phones (Graedel et al., 2015; Henckens et al., 2014), increasing competitive advantage by taking actions to reduce problems, or for altruistic reasons (Haddock-Fraser & Tourelle, 2010). Additionally, as the case study was focussed on KPN's potential in stimulating sustainable consumption, this study contributed to literature by providing corporate-level opportunities and barriers in addressing sustainable consumption of mobile phones

However, results of this study have shown that KPN cannot fully address sustainable consumption at a system-level by means of self-governance. Therefore, it is argued that in order to tackle the negative environmental and social impacts of mobile phone consumption, there is more potential in other modes of governance. A recommendation for further research therefore concerns a study on the potential of other modes of governance in intervening towards sustainable consumption, such as: public-private governance in which central government agencies take a leading role while companies are granted a preconditioned role, or interactive governance in which governments, companies, and civil society act together (Driessen et al., 2012).

#### *Limitations of the research*

Throughout the thesis process, several research limitations occurred. During the data collection interviews were conducted; collecting the data was not considered a problem as both the respondents of the consumer interviews and interviewees at the corporate level were willing to contribute to the research. However, in terms of reliability, the interview outcomes might be biased by interviewees withholding specific information for whatever reason. At the corporate level, mainly internal stakeholders have been interviewed in the form of top level managers. Lozano (2012), argues that interviewing top executives or leaders can be a reliable source of knowledge because they play vital roles if companies are planning organisational changes for sustainability. However, by interviewing this group of internal stakeholders, results can be hierarchically biased since it is unknown how other employees at strategic position view the topic (e.g. store managers). Considering the consumer interviews, the results can be biased due to the fact that the questionnaire was only provided and not explained. Therefore, consumers had few possibilities to seek clarification for questions they might not understand or misinterpret.

Besides the interviews, some KPN documents and information provided on KPN's website has been analysed to identify measures that are related to sustainable consumption. However, it should be noted that the collection of this content was not very extensive. This was due to the fact that these measures are not yet extensively taken into account in sustainability reporting or other types of documents. This also confirmed that KPN has difficulties in finding the right means to communicate about sustainability measures related to the consumer market, and the fact that previous sustainability efforts were mainly focussed on infrastructure and network operations. At the same time, the rather limited availability of content underscores the relevance for KPN to generate more knowledge and information in this field of expertise. In addition, feedback from the expert panel enabled to confirm this need for new insights and the contribution of the research for KPN's strategic interventions.

Problems regarding construct validity during the data collection might have occurred due to “subjective judgements” of the researcher to collect the data. Particularly, this might have occurred as the questionnaire items of the consumer interviews were based on assumptions rather than established relations. Additionally, some questionnaire items have not been used to answer the assumption as they appeared unnecessary for cross-referencing. However, several questionnaire items deliberately addressed the same topic in different formulations, which allowed for a consistency check on the answers.

During the data analysis limitations might concern the internal validity, due to inferences that were based on interviews and documentary data, although events were not directly observed. This may be applicable for the analysis of the interviews at the corporate level, as elements from Grounded Theory were applied and relations were established in a narrative form. However, this method allowed for analysing data through a combination of deductive and inductive thinking. This means that on the one hand the interview questions, and thus the obtained data, was based on findings from literature and KPN content. On the other hand, it allowed for new insights to be derived from data which were not pre-defined in the literature.

Limitations with regard to the research findings include the generalizability and external validity. To the knowledge of the author, external validation of the research is not possible with reference cases, due to the unique combination of sustainable consumption within the mobile phone sector and the two levels of analysis that were applied throughout the research. Thus, in order to use the findings of this research for the implementation of sustainable consumption strategy in other companies or contexts, an assessment of the differences and similarities of the other context compared to the KPN context is required. However, to reduce limitations regarding external validity, rich empirical data was obtained. The consumer interviews were conducted with many KPN customers and the corporate interviews were conducted with managers with different levels of expertise, which allowed for different contributions, insights, and data triangulation.

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## Appendices

### I. Consumer questionnaire

Dear reader,

My name is Noor Gerretsen and I am a master student Sustainable Development at Utrecht University. I am currently writing my thesis at KPN. As a part of this, I examine the role of sustainability factors in your choice for a specific mobile phone. I have formulated a couple of questions and statements, and I would appreciate it if you would answer them for me. This will take about 5 to 10 minutes. I would like to thank you in advance for your cooperation.

Mobile phone brands cope differently with sustainability aspects. This questionnaire contains questions about your choice for a mobile phone and whether these aspects apply. For my research I have defined sustainability with regard to mobile phones as follows:

*Mobile phones whereby during the production process, during use, and during the end of life/recycling phase a negative environmental and social impact is reduced and/or prevented.*

**This survey will be anonymous. However, would you please answer these general questions below?**

---

Gender	<input type="radio"/> Male
	<input type="radio"/> Female

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Age

---

City

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**Unless stated otherwise, it is not possible to give multiple answers to the following questions. Choose the answer that suits best with each statement.**

---

What type of subscription do you have or are you looking for?	<input type="radio"/> A subscription including a mobile phone <input type="radio"/> Sim-only combined with a separate mobile phone
What features do you use on your smartphone (multiple answers possible)?	<input type="radio"/> I only call and send text messages <input type="radio"/> I also use the internet and several apps <input type="radio"/> I also watch TV and YouTube on my phone <input type="radio"/> I also play a lot of games <input type="radio"/> I don't need a smartphone
Are you familiar with the Eco-rating of mobile phones?	<input type="radio"/> Yes, I have read about it on KPN's website <input type="radio"/> Yes, I have received information outside of KPN <input type="radio"/> No, but I have heard about it <input type="radio"/> No, I have never heard about it
Are you familiar with the Fairphone?	<input type="radio"/> Yes, I have read about it on KPN's website <input type="radio"/> Yes, I have received information outside of KPN <input type="radio"/> No, but I have heard about it <input type="radio"/> No, I have never heard about it

---

**The following statements only have one possible answer, choosing multiple answers per statement is not allowed. Choose the answer that best suits each statement.**

	Totally disagree	Disagree	Don't agree, nor disagree	Agree	Totally agree
A mobile phone is a luxury product and not a necessary product.	0	0	0	0	0
Before purchasing a mobile phone, I inquire about the social impact of the production processes.	0	0	0	0	0
I am aware of the fact that mobile phones can be returned to KPN for recycling.	0	0	0	0	0
I am willing to return my old phone for recycling.	0	0	0	0	0
By making a conscious choice for a more sustainable phone, I can contribute positively to a more sustainable mobile phone industry.	0	0	0	0	0
I am provided with transparent information about the sustainability aspects of mobile phones while making my purchase choice for a specific device.	0	0	0	0	0
When purchasing a mobile phone, I take the environmental consequences of the device's life cycle into account.	0	0	0	0	0
(Social) media plays a significant role in my choice for a mobile phone.	0	0	0	0	0
If I could contribute positively to more sustainable production processes of mobile phones by means of providing feedback about production processes, I would do so.	0	0	0	0	0
Before purchasing a mobile phone, I always take specifications of multiple devices into account, in order to make a conscious and deliberate choice.	0	0	0	0	0
I don't consider a mobile phone important.	0	0	0	0	0
I am willing to choose for a specific phone, if I know that this device is more sustainably produced and more sustainable in usage than other mobile phones.	0	0	0	0	0
I consider KPN to be a company that actively promotes sustainability.	0	0	0	0	0
My choice for a specific mobile phone is based on the choice for my previous/current mobile phone.	0	0	0	0	0
When I am convinced of the positive (sustainable) characteristics of a mobile phone, I share these convictions with family/friends/relatives.	0	0	0	0	0
Clear information regarding the social and environmental impacts of the production processes affects my choice for a specific mobile phone.	0	0	0	0	0
I cannot live without my mobile phone.	0	0	0	0	0

**Could you give the relative importance of the following factors that play a role in your choice for a mobile phone? This can be done by ranking the factors with the numbers 1 to 10.**

Rank
Costs
Design
Durability
(Social) media
Usability
Sustainability
Energy usage
Materials
Brand
Functionality

**Finally, two questions regarding the sharing/receiving of information, where giving multiple answers is allowed**

---

**If** you share your conviction for positive (sustainable) characteristics of a mobile phone with family/friends/relatives, in what way would you do that (multiple answers possible)?

<input type="radio"/> Personal contact
<input type="radio"/> (Social) media
<input type="radio"/> Internet
<input type="radio"/> I don't

---

**If** (social) media is important for your choice regarding a mobile phone, in what way is this the case and how do you appreciate such messages/information (e.g. attractiveness, clearness, etc.)?

---



## II. Manager interview outline

### Introduction

My name is Noor Gerretsen and I am a master student Sustainable Development at Utrecht University. I am currently writing my thesis at KPN. My research focuses on sustainable consumption and the role of companies in stimulating sustainable consumption. Therefore I am using KPN as a case study, specifically with the aim to study consumers in the mobile phone market. I have conducted interviews with consumers to examine to what extent specific factors are relevant for the choice they make when purchasing a specific mobile phone, and the role of current measures taken by KPN in the field of sustainable consumption. Therefore I have taken into account the Fairphone, Eco-rating and recycling.

I would like to get insights in the possibilities and points of improvement for KPN towards sustainable consumption measures, and therefore I am conducting interviews with relevant stakeholders/managers at KPN.

For the aim of my research, sustainable consumption refers to: factors that may or may not reflect concerns about the effects of the lifecycle and associated energy use of a mobile phone on the natural environment and social justice, and behaviour that aims to harm this environment as little as possible while buying and using the device.

I have prepared a couple of questions I would like to ask. Do you mind if I record the interview? For the research I will also transcribe the interview. I can optionally send this transcription to you if you want to read or adjust it.

First I would like to ask some questions about your function.

1. What does your job function exactly entail?
2. For how long have you been working at KPN in your current position?
3. In what ways is your job related to corporate sustainability within KPN?
4. How are your daily job activities related to the mobile phone consumer market?

### Eco-rating

5. Are you familiar with Eco-rating?
6. Do you think that Eco-rating is being successfully communicated towards consumers?

- If yes, why?

- If no, what are points for improvement?

7. Do you think Eco-rating is an appropriate way to make consumers more aware or to stimulate them to take sustainability impacts into account?

### **Fairphone**

8. To what extent/in what way does KPN communicate towards its consumers about Fairphone?
9. What are points for improvement?

### **Recycling**

10. Consumers can return their mobile phone at KPN for recycling, how is this communicated towards consumers?
11. What are points for improvement?
12. In what way, do you think that KPN can make consumers more aware of the sustainability impact of a mobile phone's life cycle?

### **Strategic relevance**

13. What do you think that KPN can do to further develop its strategy and measures towards sustainable consumption?
  - Which external actors should/can be involved?
14. Why do or don't you think it is important for KPN to focus on sustainable consumption?
15. Do you think that a strategy and measures towards sustainable consumption can contribute to a more circular business model for KPN?
16. Where do you see the most potential for KPN in the following three types of strategies (multiple answers are possible): sustainable innovation, choice influencing, or choice editing?
  - Why?

### **Completion**

17. Do you have any questions or recommendations?

Do you have any documents available in which I can find more information about the themes we have discussed?

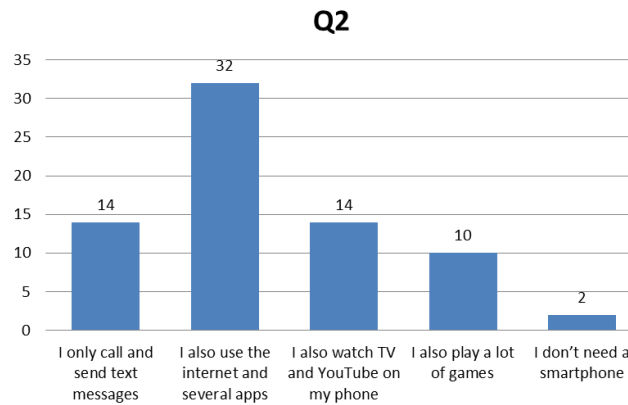
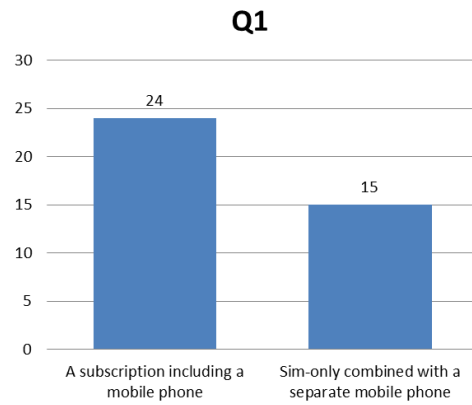
### III. Manager interviewees

<i>Job title</i>	<i>Aim</i>
Interviewee I: Marketing manager	To gain understanding in KPN's marketing activities specifically focussed on mobile phone consumers.
Interviewee II: Director Corporate communication & CSR	To gain understanding in processes of corporate communication in the field of sustainability and the company's CSR policy.
Interviewee III: CSR manager	To gain understanding in the translation of KPN's sustainability goals into a corporate sustainability strategy.
Interviewee IV: Manager Energy management	To gain understanding in the coordination of energy-related and environmental activities within the company.
Interviewee V: Director Product house	To gain understanding in processes regarding procurement and sales processes of mobile phones.
Interviewee VI: Manager Trade	To gain understanding in KPN's processing and recycling procedures of mobile phones.
Interviewee VII: (External) Operator Relations at Fairphone	To gain understanding in KPN's cooperation in Fairphone and more background information on Fairphone as a company, its vision and mission, as well as its products.

### IV. Expert panel participants

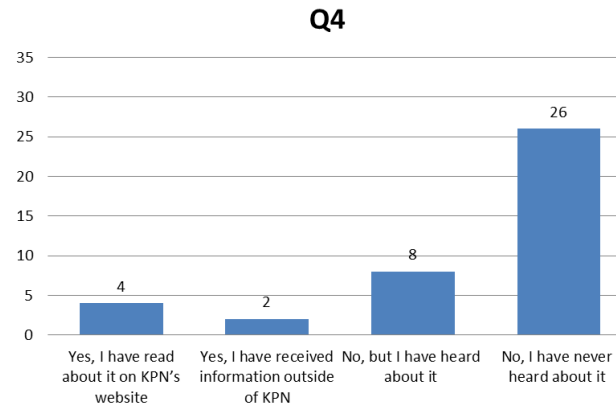
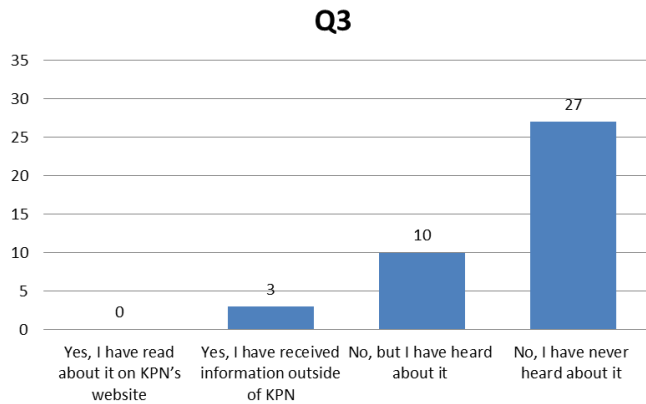
<i>Expert</i>	<i>Job title</i>
Expert I	Director Corporate Communication & CSR
Expert II	CSR Manager
Expert III	Manager Energy Management
Expert IV	Market analyst Consumer market
Expert V	Business Value Management Advisor
Expert VI	Senior Information Analyst
Expert VII	Consultant Energy and Environmental management

V. Consumer questionnaire answers



Q1: "What type of contract do you have or are you looking for?"

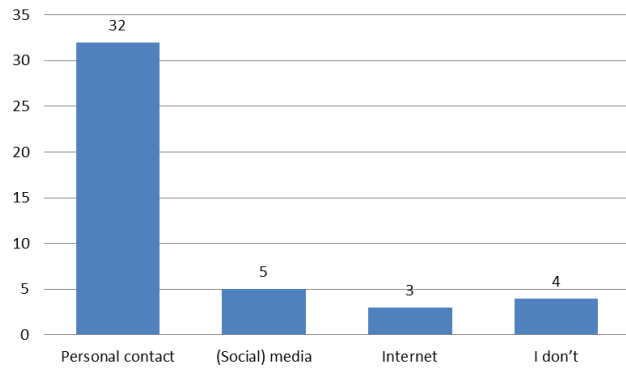
Q2: "What features do you use on your smartphone (multiple answers possible)?"



Q3: "Are you familiar with the Eco-rating of mobile phones?"

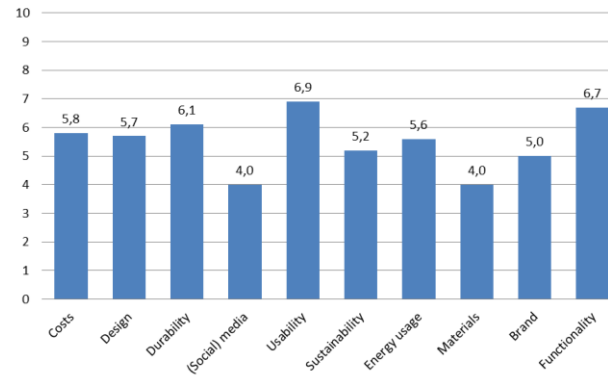
Q4: "Are you familiar with the Fairphone?"

**Q5**



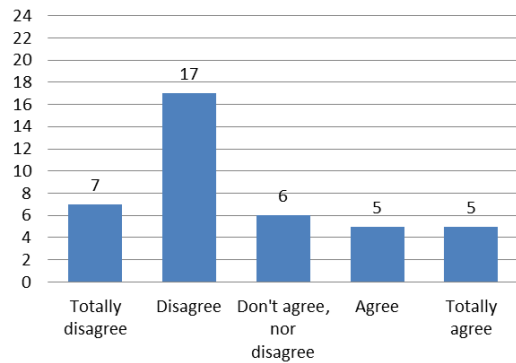
Q5: "If you share your conviction for positive (sustainable) characteristics of a mobile phone with family/friends/relatives, in what way would you do that (multiple answers possible)?"

**Q6**



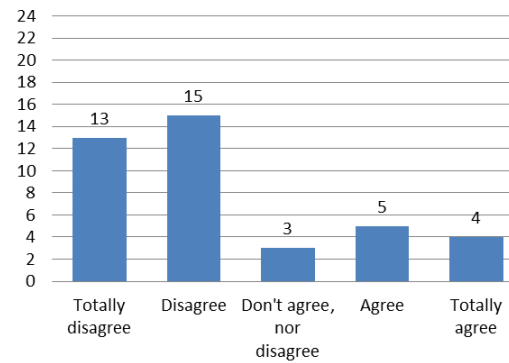
Q6: "Could you give the relative importance of the following factors that play a role in your choice for a mobile phone? This can be done by ranking the factors with the numbers 1 to 10."

**Q7**

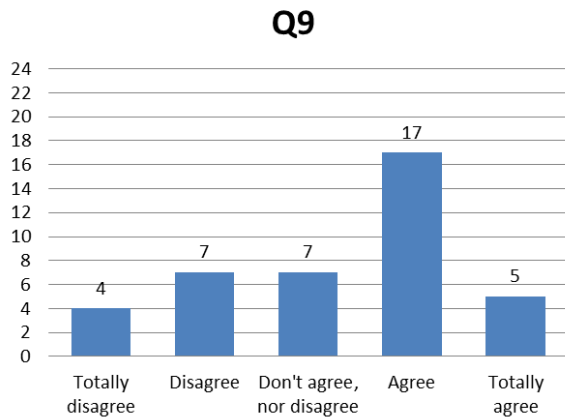


Q7: "A mobile phone is a luxury product and not a necessary product."

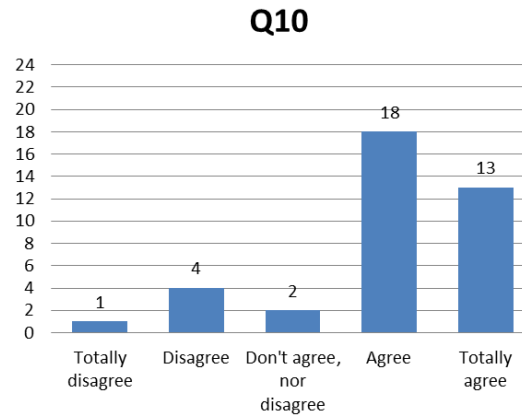
**Q8**



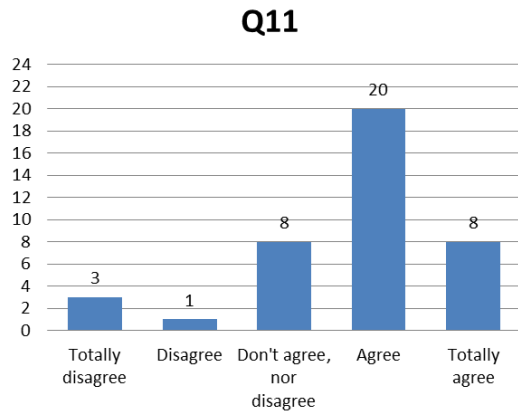
Q8: "Before purchasing a mobile phone, I inquire about the social impact of the production processes."



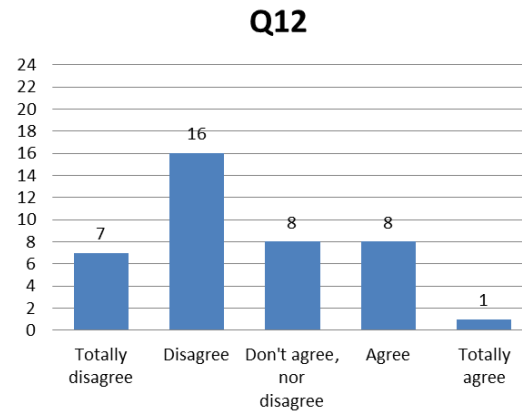
Q9: "I am aware of the fact that mobile phones can be returned to KPN for recycling."



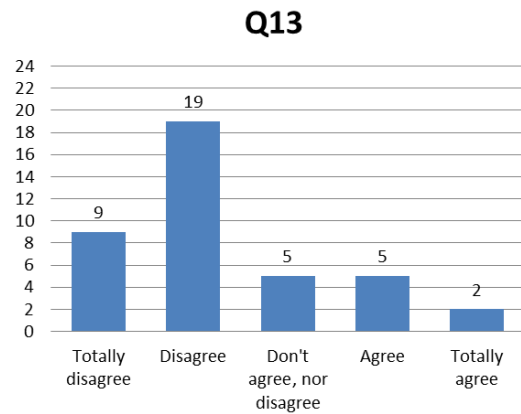
Q10: "I am willing to return my old phone for recycling."



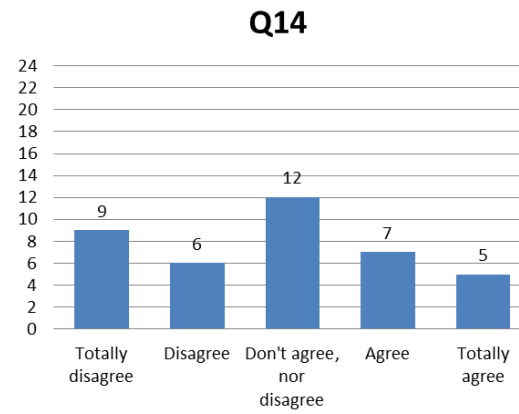
Q11: "By making a conscious choice for a more sustainable phone, I can contribute positively to a more sustainable mobile phone industry."



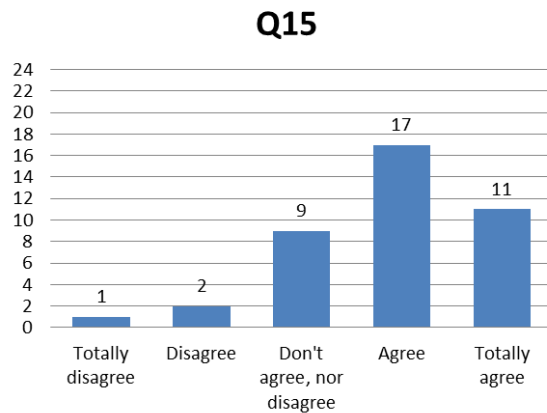
Q12: "I am provided with transparent information about the sustainability aspects of mobile phones while making my purchase choice for a specific device."



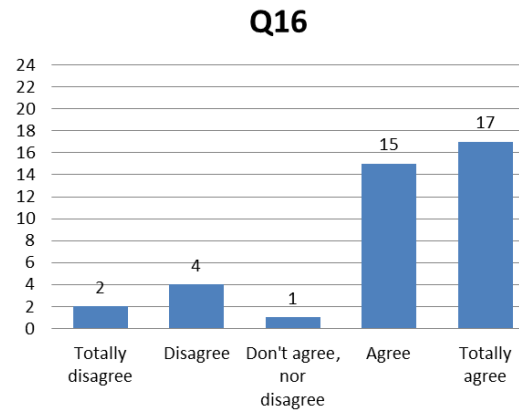
Q13: “When purchasing a mobile phone, I take the environmental consequences of the device’s life cycle into account.”



Q14: “(Social) media plays a significant role in my choice for a new mobile phone.”

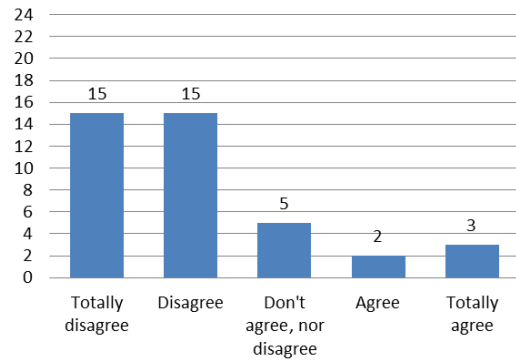


Q15: “If I could contribute positively to more sustainable production processes of mobile phones by means of providing feedback, I would do so.”



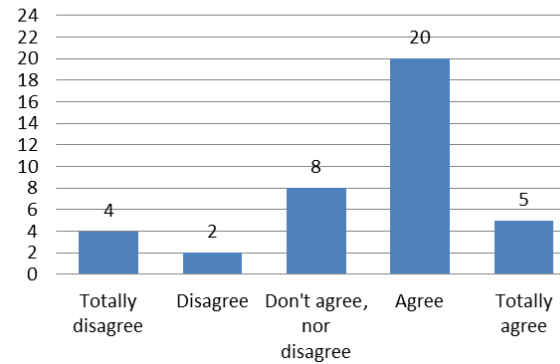
Q16: “Before purchasing a mobile phone, I always take specifications of multiple devices into account, in order to make a conscious and deliberate choice.”

**Q17**



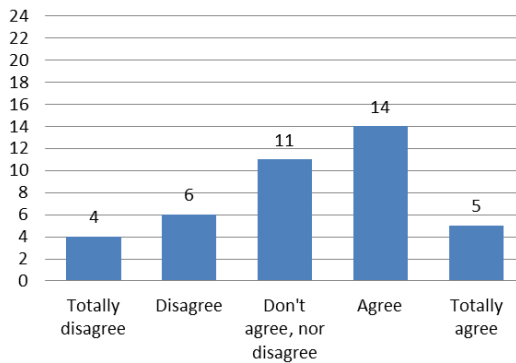
Q17: "I don't consider a mobile phone as important."

**Q18**



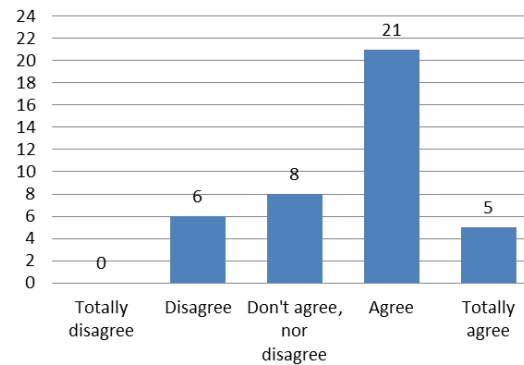
Q18: "I am willing to choose for a specific phone, if I know that this device is more sustainably produced and more sustainable in usage than other phones."

**Q19**



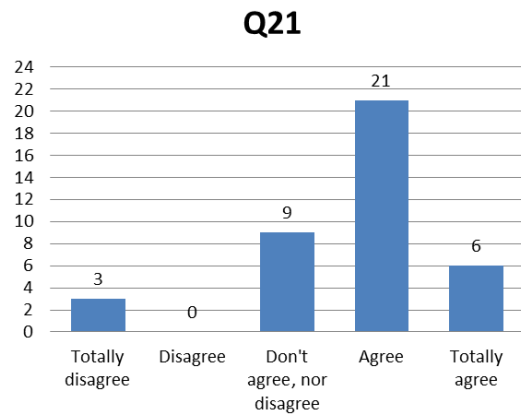
Q19: "I consider KPN to be a company that actively promotes sustainability."

**Q20**

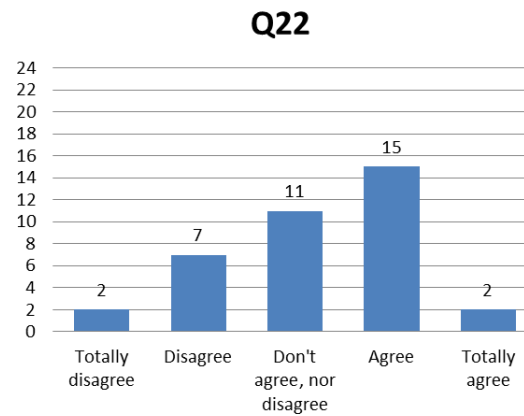


Q20: "My choice for a specific mobile phone is based on the same reasons as my choice for my previous/current mobile phones (e.g. brand)."

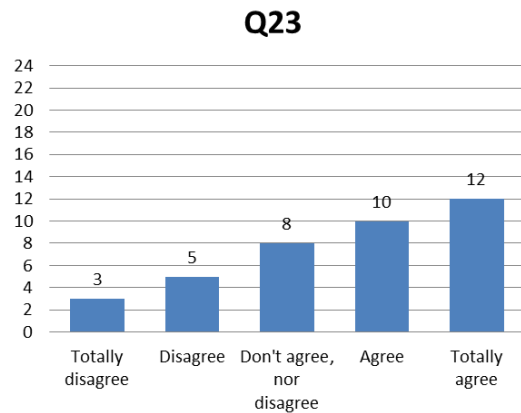




Q21: “When I am convinced of the positive (sustainable) characteristics of a mobile phone, I share these convictions with family/friends/relatives.”



Q22: “Clear information regarding the social and environmental impacts of the production processes affects my choice for a specific mobile phone.”



Q23: “I cannot live without my mobile phone.”