There is something new under the sun

A Qualitative Study on how Corporations in Northern Europe buy Rooftop Solar PV

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Abstract

Corporations play a vital part in accelerating the transition to a renewable energy system which is a crucial sector to decarbonise to be aligned with the Paris Agreement. One way in which they can contribute to the transition is through the deployment of rooftop solar PV plants that produce renewable electricity. While scholars have thoroughly investigated what factors affect the adoption of a variety of green practices, technologies, and energies, few studies examine how these factors affect the adoption of rooftop solar PV in the context of an organisational buying process. With a novel use of theoretical frameworks and 17 in-depth semi-structured interviews, this master thesis outlines how corporations in Northern Europe buy rooftop solar PV, what factors affect their organisational buying process and how. The result is a new proposed theoretical framework that outlines the organisational buying process for rooftop solar PV which indicates that a variety of factors affect the buying process relating to the technology, organisation, environment and supplier. The implication of this master thesis is the proposed conceptual framework for how corporations buy rooftop solar PV which can inform suppliers, policymakers and potential customers of rooftop solar PV plants. Suggestions for future research include redoing the study with a more diversified sample and restricting it to control for the experience the respondents have with regard to rooftop solar PV.

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1. Introduction

This section of the master thesis outlines the background of the subject, the aim, anticipated contribution and research questions. The section finishes with the delimitations of the master thesis.

1.1 Background

Humanity needs to significantly decrease the emission of greenhouse gases (GHG) to limit the negative externalities of climate change (IPCC, 2021). Since energy constitutes more than 70% of the world's GHG emissions, the energy sector is a crucial sector to decarbonise to enable a sustainable future (Our World in Data, 2020a). One lever to decarbonise the energy sector includes an increase in the deployment of green energy (IPCC, 2021). According to Zarnikau (2003), green energy is electricity generated by using renewable energy resources which includes technologies such as solar photovoltaic (PV), wind farms, biomass projects, and geothermal projects.

Within solar PV, it is common to make the distinction between ground-mounted, often large utility-scale systems, and rooftop, often smaller systems (IRENA, 2017). Even though both types of systems are important to increase the production of solar energy, the rooftop-based systems provide one main advantage in comparison to the utility-scale (ibid, 2017). Smaller rooftop solar PV plants tend to meet less social resistance than large scale utility projects, probably as they do not usually occupy productive land (Cousse, 2021). Even though the rooftop systems are usually smaller in size when considering individual solar PV plants, they still have the potential to produce a significant amount of energy in aggregate (Bódis et al., 2019).

In terms of stakeholders that will lead the transition to renewable energy production from rooftop-mounted solar PV plants, the commercial and industrial sectors both consume a significant part of Europe’s electricity (IEA, 2021) and archetypically have roofs that are suitable for solar PV (Byrne et al., 2015). This makes the commercial and industrial sector a suitable stakeholder to produce more solar energy from rooftop solar PV plants.

Even though solar PV is the fastest-growing energy source in the world (Our World in Data, 2020b), some industry organisations claim that the technology is not diffused fast enough to be consistent with a cost-efficient pathway in line with the 1.5°C target outlined in the Paris Agreement (Solar Power Europe, 2021). European countries need to reach 870 GW of solar capacity in aggregate by 2030 to enable such a development (ibid, 2021). Nonetheless, the realistic scenario with the current development realises 588 GW of solar capacity by 2030 which is 32% less than the stated goal. Therefore, additional measures that identify and solve bottlenecks are needed for the acceleration of rooftop solar energy (ibid, 2021).

It is crucial to understand what factors affect the adoption of solar PV in order to accelerate its deployment. Within the previous research on green adoption, there are several studies with regard to the factors that affect the adoption of green practices (see example: Lin & Ho, 2011; Qin et al., 2022), technologies (see example: Hammar & Löfgren, 2010; Tran et al., 2020; Fu et al., 2018) and energy (see example: Rahbauer et al., 2016; Tatoglu, Bayraktar & Arda, 2015; Collins et al., 2007). The studies find that a wide variety of factors affect green adoption. For the purpose of this literature review, the factors are categorised into three clusters: objective characteristics, internal factors and lastly external factors. Objective characteristics include company size (Collins et al., 2007), dedicated R&D expenditures (Hammar & Löfgren, 2010), and economics (Ghisetti et al., 2017; Rusinko, 2007). Internal factors include knowledge (Rahbauer et al., 2016: Boiral, 2002; Chou, Chen & Wang, 2013; Faiers, Cook & Neame, 2007) and internal consistency (Tran et al., 2020; Zhu & Sarkis, 2007). External factors include competitive pressure (Fu et al., 2018; Tatoglu, Bayraktar & Arda, 2015; Rusinko, 2007; Liu, Yang, & Lin, 2014), regulatory pressure (Lin & Ho, 2011) and customer pressure (Rahbauer et al., 2016). These studies provide insights with regards to what factors affect the adoption of green energy, practices and technologies and indicate a wide array of factors. However, they do not outline the overall organisational buying process (OBP) in which the adoption takes place, where and how in that process different factors affect the OBP or consider rooftop solar PV as a specific technology.

1.2 Aim and contribution

This master thesis, therefore, aims to shed light on the OBP for rooftop solar PV for corporations and examine what factors that affect that process. By doing so, both a theoretical and an empirical contribution is made.

Drawing on theoretical frameworks applied in a novel context, this study extends the previous studies by combining existing frameworks and studying them in a new setting. The frameworks of choice are *The OBP* developed by Hutt and Speh (2018) which outlines eight steps in an organisation's buying process and the *TOE framework* developed by Tornatzky and Fleischer (1990) which identifies factors that affect adoption. The end result is an integrated theoretical framework that helps the study answer how corporations with operations in Northern Europe buy rooftop solar PV, what factors affect the OBP and how the factors affect it.

The empirical contribution of this master thesis is that it provides insights that enable an increase in the use of rooftop solar PV. By informing policymakers, suppliers and potential rooftop solar clients of how corporations buy rooftop solar PV and what factors that influence their buying possess and how, they can improve potential policies, offerings and internal buying processes respectively that in turn accelerate the transition to a renewable energy system.

1.3 Research question

Given this background, the research questions of this master thesis are the following:

RQ1: How do corporations in Northern Europe buy rooftop solar PV?

- RQ1.1: What factors affect the buying process for rooftop solar PV?
- RQ1.2: How do these factors affect the buying process for rooftop solar PV?

1.4 Delimitation

The delimitations of this master thesis are twofold. Firstly, this master thesis only considers corporations that have operations in Northern Europe as a sample due to convenience reasons consisting of culture and language barriers. It could have been relevant to sample additional corporations that have brought rooftop solar PV in either other countries in Europe or on other continents. For example, China has accounted for the largest share of solar PV capacity additions in the last years (IEA, 2020) and is expected to account for the largest share of future build-out (Statista, 2022). Nonetheless, due to the perceived cultural and language obstacles connected to interviewing stakeholders at such corporations, this master thesis limits itself to corporations with operations in Northern Europe.

The second delimitation is that this thesis will only evaluate the OBP and the factors that affect the buyer process of rooftop solar PV as a technology. Other renewable energy technologies are not covered in this study. This is due to the potential of solar PV as it is the fastest growing energy source in the world (Our World in Data, 2020b) and as it is one of the few renewable energies that can be produced on-site on rooftops (RE-Source, 2020).

2. Literature review

This section presents the literature reviewed in the study. It includes an explanation of corporate procurement of renewable energy, general background and available business models for rooftop solar PV, a review of the previous studies with regards to green adoption and finally presents the research gap.

2.1 Corporate procurement of renewable electricity

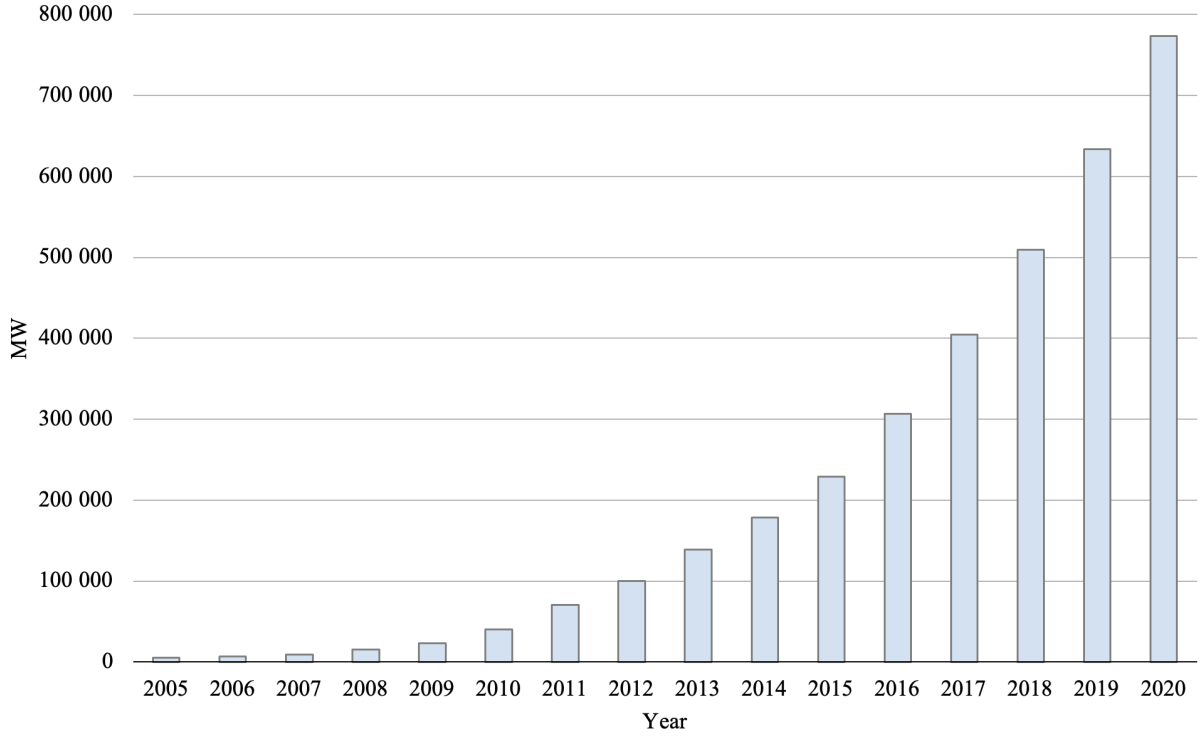
For the purposes of this master thesis, the alternatives for corporate renewable energy procurements are outlined. The primary reason for this is that it is a prerequisite to understanding the empirical findings and subsequent analysis. RE-Source (2020) outlines different levels of visibility and environmental value in renewable electricity procurement. The lowest level of visibility and environmental value is procuring electricity without certificates that guarantee that its origin is from a renewable energy source. Another option includes procuring electricity and certificates that guarantee that the energy stems from a renewable energy source. The third and most visible and sustainable option is to have on-site, including rooftop, generation of green energy which includes solar power (ibid, 2020).

2.2 Solar PV

2.1.1 Background of solar PV

A solar PV panel is composed of solar cells which absorb the radiation from the sun and transfer it to electrons. These electrons can flow through the material thanks to the excess energy which becomes the electrical current (Energy.gov, 2020). A solar panel has an expected lifetime of more than 25 years in Europe (Franz & Piringer, 2020). The production costs of solar energy have decreased by 89% between 2009 and 2019 which is the most significant cost decrease in comparison to other power producing technologies (Our World in Data, 2021). Moreover, the cumulative installed capacity of Solar PV has increased from roughly 5,000 megawatts (MW) in 2005 to 773,200 MW in 2020 (Statista, 2021).

Chart 1 - Cumulative installed solar PV capacity worldwide

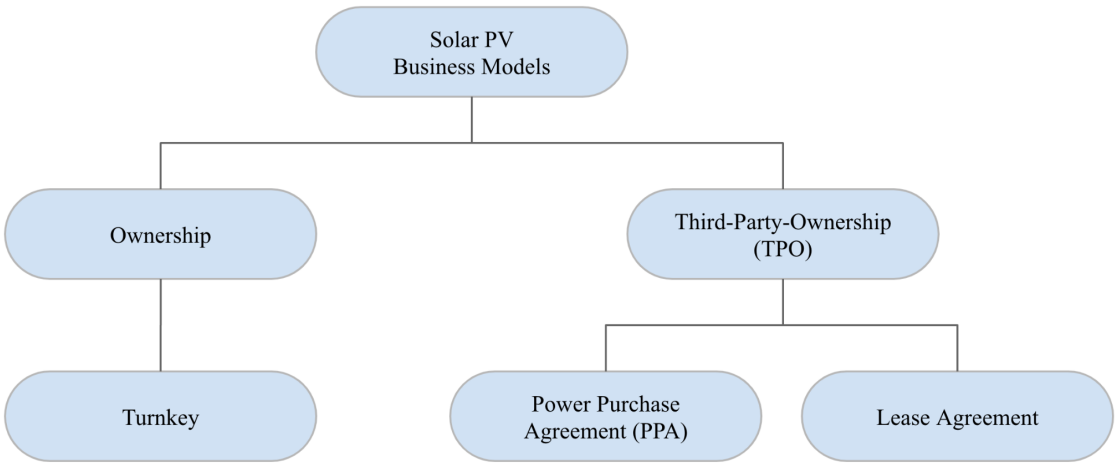


Europe accounted for 16% of the global solar PV net capacity additions worldwide in 2019 (IEA, 2020) and it is the cheapest and most easily clean energy technology to deploy (Solar Power Europe, 2020). Additionally, previous studies have identified solar PV as superior to other sources of renewable energy thanks to its accessibility, availability, capacity, cleanliness, and efficiency (Kannan & Vakeesan, 2016).

2.1.3 Business models for solar

There has been extensive research into different business models for solar PV in the residential market (Drury et al, 2012; Overholm, 2015). Nonetheless, research on different business models of solar PV for the corporate segment is limited. The most recent review of available business models for Solar PV for corporations in Europe is outlined by the industry organisation RE-Source (2020) which outlines two main business models for solar PV (Figure 1). The first one consists of *ownership* where the customer finances and owns the solar asset and has full control and responsibility for the financial, operational, legal, technical and sustainability aspects. This business model often includes buying a solar PV plant with a *Turnkey* contract meaning that an external contractor will construct the solar PV plant and subsequently hand it over to a client once it is operational. In this business model, the client takes the initial investment and is responsible to maintain and operate the solar asset. The other main business model which is referred to as the umbrella term *Third-Party-Ownership* (TPO) by Overholm (2015) includes both *Power-Purchase-Agreements* (PPAs) and *Lease agreements* in RE-Source (2020) split. In both PPAs and Lease agreements, a supplier takes the initial investment of procuring and installing the solar PV plant, owns it throughout its lifetime and is responsible for its operations and maintenance. The client either pays a flat fee in the *Lease agreemen*t or a fixed price per unit of electricity in the *PPA agreement*.

Figure 1 - Solar PV Business Models



2.2 Factors affecting green adoption in organisations

As the research on corporate renewable energy adoption in companies is limited, this literature review has broadened the scope and reviewed factors that affect green adoption in organisations. This line of research investigate the adoption of green *practises* (Hwang, Huang & Wu, 2016; Gonzalez-Benito, 2006; Ramus, 2000; Rusinko, 2007; Yunus et al., 2013; Boiral, 2002; Chou, Chen & Wang, 2013; Lin & Ho, 2011; Qin et al., 2022; Sharma & Henriques, 2005; Zhu & Sarkis, 2007; Christmann, 2004; Capelle-Blancard & Laguna, 2010; Aragon-Correa & Sharma, 2003; Buysse & Verbeke, 2003; Deif, 2011; Etzion, 2007; Guoyou et al., 2013; Vachon, Halley & Beaulieu, 2009; Wolf, 2011), *technologies* (Hammar & Löfgren, 2010; Tran et al., 2020; Fu et al., 2018; Ghisetti, 2017; Ensminger et al., 2012; Messeni Petruzzelli et al., 2011), and *energy* (Rahbauer et al., 2016; Tatoglu, Bayraktar & Arda, 2015; Collins et al., 2007; Hsu et al., 2013). The main finding from reviewing these studies is that there is a wide range of factors that affect the adoption of green practices, technologies and energy. These factors are categorised into clusters: *objective characteristics*, *internal factors* and *external factors*.

The first cluster of factors affecting green adoption, *objective characteristics*, includes the factors *Economics & Financials* (Rusinko, 2007; Hammar & Löfgren, 2010; Rahbauer et al., 2016; Ghisetti et al., 2017; Etzion, 2007), *Company size* (Rahbauer et al., 2016; Gonzalez-Benito, 2006; Tatoglu, Bayraktar & Arda, 2015; Collins et al., 2007) and lastly *Company Archetype* (Gonzalez-Benito, 2006).

The second cluster of factors affecting green adoption, *internal factors*, includes factors such as *Management Support (*Hwang, Huang & Wu, 2016; Tran et al., 2020; Yunus et al, 2013; Gonzalez-Benito, 2006; Fu et al., 2018; Lin & Ho, 2011), *Organisational Support* (Ramus, 2000; Lin & Ho, 2011; Qin et al 2022; Chou, Chen & Wang, 2013; Tatoglu, Bayraktar & Arda, 2015; Fu et al, 2018; Buysse & Verbeke, 2003; Messeni Petruzzelli et al., 2011), Organisational *Factors* (Hwang, Huang & Wu, 2016; Boiral, 2002; Gonzalez-Benito, 2006; Fu et al, 2018; Qin et al 2022; Ensminger et al., 2012) and *Marketing Opportunities* (Qin et al 2022; Rahbauer et al., 2016).

The third and final cluster of factors affecting green adoption, *external factors*, includes factors such as *External Stakeholder Pressure* (Christmann, 2004; Hwang, Huang & Wu, 2016; Qin et al 2022; Rahbauer et al., 2016; Zhu & Sarkis, 2007; Fu et al, 2018; Gonzalez-Benito, 2006; Lin & Ho, 2011; Tatoglu, Bayraktar & Arda, 2015; Sharma & Henriques, 2005; Capelle-Blancard & Laguna, 2010; Guoyou et al., 2013; Vachon, Halley & Beaulieu, 2009; Wolf, 2011), *Government, Regulation and Legal* (Hwang, Huang & Wu, 2016; Qin et al 2022; Rahbauer et al., 2016; Lin & Ho 2011; Tran et al., 2020 and *Location* (Gonzalez-Benito, 2006; Tatoglu, Bayraktar & Arda, 2015; Aragon-Correa & Sharma, 2003).

The study area, author, sample and approach/methodology in each of the previous studies are summarised in the table below (Table 1). When considering the samples used, many nations are represented across several continents including Europe, Asia and North America. However, there are very few studies that include a multi-country sample. Additionally, most previous studies use quantitative methods to derive what factors affect green adoption. Yet, few use a qualitative approach in which they attempt to create or develop theory to understand how the factors affect the adoption of green practices, factors or energies.

Table 1 - Literature review of green adoption

Study Area	Author	Sample[1]	Approach/Methodology
Practises	Hwang, Huang & Wu, 2016	Semiconductor industry in Taiwan	Quantitative
	Gonzalez-Benito, 2006	N/A	Literature review
	Ramus, 2000	353 employees at six European companies	Quantitative
	Rusinko, 2007	84 companies in the commercial carpet industry in the USA	Quantitative
	Yunus et al., 2013	Companies in the United Arab Emirates	Quantitative
	Boiral, 2002	126 interviews at eight industrial companies in Canada	Case method and grounded theory
	Chou, Chen & Wang, 2013	245 respondents from the restaurant industry in Taiwan	Quantitative
	Lin & Ho, 2011	322 respondents of logistic companies in China	Quantitative
	Qin et al., 2022	N/A	Bibliometric review
	Sharma & Henriques, 2005	38 companies in the Canadian forest industry	Qualitative
	Zhu & Sarkis, 2007	341 Chinese manufacturing companies	Quantitative
	Christmann, 2004	512 chemical companies in the United States.	Quantitative
	Capelle-Blancard & Laguna, 2010	Publicly listed companies in Australia, France, Germany, Japan, Netherlands, Norway, Spain, Switzerland, United Kingdom, the United States, South Africa and South Korea	Quantitative
	Guoyou et al., 2013	1268 Chinese firms	Quantitative
	Aragon-Correa & Sharma, 2003	N/A	Literature review
	Buysse & Verbeke, 2003	197 firms operating in Belgium	Quantitative
	Deif, 2011	One wood product manufacturer	Qualitative
	Etzion, 2007	N/A	Literature review
	Guoyou et al., 2013	1268 enterprises in China	Quantitative
	Vachon, Halley & Beaulieu., 2009	512 manufacturing companies in Canada	Quantitative
	Wolf, 2011	Four German manufacturing companies	Case Study
Technologies	Hammar & Löfgren, 2010	114 Swedish companies	Quantitative
	Tran et al, 2020	4760 respondents covering Belgium, France, Germany, Italy, Spain, Turkey and UK	Quantitative
	Fu et al., 2018	N/A	Literature review
	Ghisetti et al., 2017	1885 Small and Medium sized enterprises across Europe	Quantitative
	Ensminger et al., 2012	197 respondents in various industries in the USA	Quantitative
	Messeni Petruzzelli et al., 2011	Firms across four sectors in Japan, USA, Germany, France, Sweden, Italy and Taiwan	Quantitative
Energy	Rahbauer et al., 2016	N/A	Literature review
	Tatoglu, Bayraktar & Arda, 2015	519 respondents from firms in Turkey	Quantitative
	Collins et al., 2007	811 respondents from companies in New Zealand	Quantitative
	Hsu et al., 2013	132 respondents from manufacturing firms in Malaysia	Quantitative

To conclude this literature review, the previous research on what factors that affect green adoption is fragmented. This is confirmed both through the literature review of this master thesis and the research conducted by Qin et al., (2022) who outline that one reason for its fragmentation could be its significant growth as a research subject.

[1] Based on the available data in each study

2.3 Research gap

Most of the previous studies examine the factors that affect green adoption from a quantitative standpoint in samples that are restricted to single nations and include a wide array of practices, technologies and energies. They have not considered mapping the buyer process in which these factors affect the green energy adoption, included several nations to make the results of the study applicable to a variety of countries or focused on solar PV as a particular technology. This background calls for additional research studying the OBP with multi-country samples with a particular focus on solar PV. This master thesis addresses this research gap in three dimensions. Firstly, this master's thesis sheds light on the OBP to understand what and how factors affect it. Secondly, this master thesis samples its data from corporations that have conducted rooftop solar projects across several nations in Northern Europe. Lastly, this master thesis has a particular focus on rooftop solar PV.

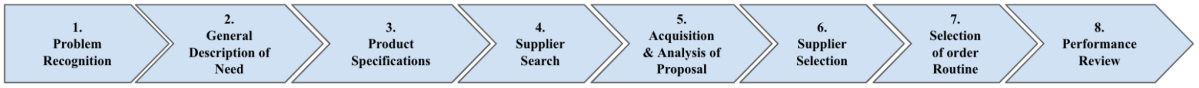
3. Theoretical framework

This section presents the theoretical framework that will be used to answer the research questions. The first part of the chapter introduces a framework for the *organisational buying process* (OBP) whereas the second part introduces the TOE framework which concerns the factors. The last section introduces the proposed theoretical framework which combines the OBP and the TOE framework.

3.1 Organisational Buying process

Several models have been developed to depict the OBP and the various stages in the process. Webster (1965) introduced one of the first models, which consisted of four stages: problem recognition, buying reasonability, the search process, and at last; the choice process stage. Despite that each B2B buying process is said to be unique (Woodside, 1996), there have been several attempts to generalise and conceptualise B2B buying patterns (Robinson, Farris & Wind 1967; Ozanne & Churchill, 1971; Webster & Wind, 1972; Kelly, 1974; Wind, 1978; Ghingold & Wilson 1998; Hutt & Speach, 2007; Chavan, Chaudhuri, & Johnston, 2019; Steward, Narus & Roehm, 2018; Hutt & Speach, 2018). As many of the authors suggest, organisations' buying process often follows a linear structure and emphasis on hierarchical phases, states, or steps that depict B2B buyers' linearly progressing from the problem recognition before the actual purchase to the post-purchase and evaluation phase (see example: Hutt & Speh, 2007; Johnston & Lewin, 1996). The OBP differs greatly between different enterprises, purchases and conditions (Lilien, 2016 and Wouters, 2004), and thus, various organisations might have slightly different buying processes. One of the most recognised models developed more recently is the model by Hutt and Speh, 2007, consisting of eight stages. Hutt and Speh have studied the buying process of organisations from 1984 (Hutt & Speh, 1984) until 2018 (Hutt & Speh, 2018). One of the author's main contributions is their development of the OBP. The authors claim that the OBP is a process and not an isolated act or event. The stages in the OBP may not progress sequentially and may vary with the complexity of the purchasing situation. Figure 2 lists the major stages in the OBP that Hutt and Speh (2018) outline in their book.

Figure 2 - Organisational buying process by Hutt and Speh (2018)



1. Problem Recognition

According to Hutt and Speh (2018), the OBP begins when a certain problem arises within the organisation that needs to be solved or through an opportunity that can be captured by acquiring a specific product or service. As a result, Hutt and Speh (2018) start the OBP with a problem recognition stage where the corporation's business problem is recognised and further clarified.

2. General Description of Need

Hutt and Speh (2018) points out that the subsequent stage occurs when an organisation identifies a need and thinks of a product that might meet this need. This stage often involves describing the general characteristics and the quantity of the required product. It was also noted by Hutt and Speh (2018) that the company must thoroughly describe the need in order to ensure that everyone in the organisation understands it and the nature of the solution the organisation should seek.

3. Product Specifications

Next stage in the buying process is the product specifications which primarily relates to the technical specifications of the desired product (Hutt & Speh, 2018). The authors
noted that this stage is conducted by an assigned team which creates detailed specifications for what the product requires.

4. Supplier Search

In this stage of the process, Hutt and Speh (2018) point out that the buying organisation searches for suppliers who can meet their needs. The buying organisation often prepares a list of competitive vendors through the use of supplier directories. The buying organisation also uses the internet or contacts other organisations for obtaining recommended suppliers.

5. Acquisition and Analysis of Proposals

In this stage of the process, Hutt and Speh (2018) point out that qualified suppliers are invited to submit their proposals. The authors noted that when the organisation's information needs are high and the desired product is more expensive and complex, this stage becomes increasingly important and formalised.

6. Supplier Selection

According to Hutt and Speh (2018), the final supplier is selected from the list of potential suppliers at this stage where the buying organisation critically reviews the proposals. The buying organisation compares and evaluates the different suppliers with each other and lists the offered attributes on the basis of the rank of importance. The buying organisation also considers warranties, past performance and reputation, vendor capabilities, customer references, ethical corporate behaviour, repair and maintenance services etc. Finally, the buying organisation makes a final decision on the chosen supplier and communicates it both externally to the supplier and internally to the organisation.

7. Selection of Order Routine

In this step, the organisation writes the final order with the selected supplier and thus the order-routine specifications are prepared in this stage (Hutt & Speh, 2018). According to Hutt and Speh (2018), this includes the final list of specifications, the selected supplier, required quantities, delivery time, price and repair and maintenance services, etc.

8. Performance Review

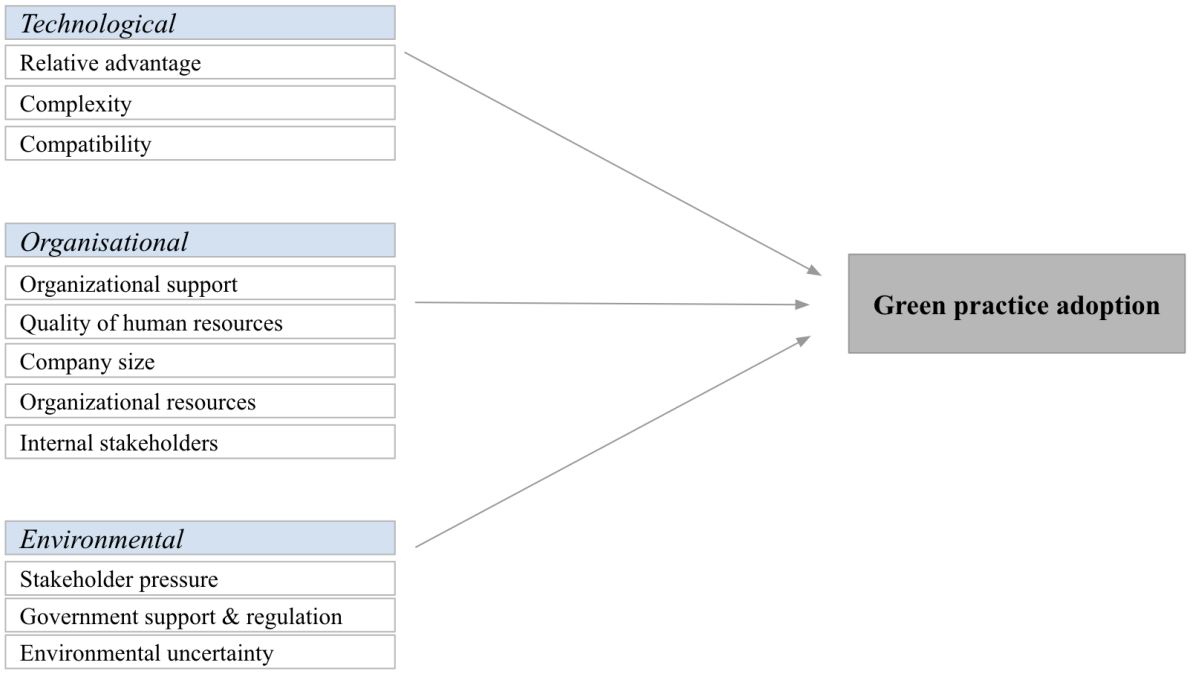
During the final stage in the process, Hutt and Speh (2018) claims that the performance of the supplier is reviewed by the buying organisation as it helps with future decision making. The extent of the performance review is dependent on the experience of the purchaser where buying a good or service for the first time usually includes a more extensive performance review. On the other hand, a straight or modified rebuy usually includes a less comprehensive review as the purchase is more defined as a routine. The authors argue that if the product doesn't manage to satisfy the needs of the organisation, the organisation may examine suppliers that were screened earlier in the procurement process.

In the OBP, it is usually a team and not a single individual that is responsible for the purchase and the different people in the team have various roles throughout the process (Hutt & Speh, 2016). Relationships within business markets are often close and enduring and commitment and trust are two incredibly critical components in achieving effective commercial partnerships (Anderson & Narus, 1998). Several authors in the organisational buying literature emphasise the importance of the situational context as the experience of organisations in the purchase will influence the buying process and thus differ between new-task, modified rebuy and straight rebuy (Hill & Hillier, 1977; Robinson, Faris & Wind, 1967; Webster & Wind, 1972). First-time buyers will approach the buying process differently compared to organisations with substantial experience (Webster & Wind, 1972; Nicosia and Wind, 1977) and thus depending on the situational context they will differ in terms of information search (Robinson, Faris & Wind, 1967; Hill & Hillier, 1977; Gordon, 1971; Wind & Webster, 1972), engagement (Webster & Wind, 1972; Nicosia and Wind, 1977) and evaluation procedure (Doyle, Arch & Michelle, 1979). Lastly, studies made on green practice adoption show that adopting green practices is a process of knowledge accumulation and usage rather than a single event (Lin & Ho, 2011).

3.2 TOE framework

One of the most commonly used models in the adoption of technological innovation is the TOE framework[2]. The TOE framework was initially developed by Tornatzky and Fleischer (1990) and explains how three main factors, *technological*, *organisational* and *environmental* affect the adoption of technological innovations (Figure 3).

Figure 3 illustrates a graphical representation of the proposed TOE framework



Source: Framework based on Lin & Ho (2011) and Hwang, Huang & Wu (2016)

Over time, different authors have interpreted the original framework made by Tornatzky and Fleischer (1990) and adapted it based on different situations and contexts (Lippert & Govindarajulu, 2006; Dedrick & West 2003; Arpaci et al., 2012; Lin & Ho, 2011; Hwang, Huang & Wu, 2016; Muafi et al., 2021; Angeles, 2022). Several authors have applied and validated the framework by looking at studies on green adoption. Based on Lin & Ho (2011) and Hwang, Huang & Wu (2016), the following sub-elements of the three main factors in the TOE framework are described below.

[2] According to google scholar, Tornatzky & Fleischer's book *"The processes of technological innovation"* has been cited over 5 500 times.

3.2.1 Technological factors

Some scholars claim that the technological factors have their origins in a very well known theory, the Innovation Diffusion Theory (Rogers, 1963) which has been validated by numerous researchers in different contexts and is one of the oldest social science theories (Choudhury & Karahanna, 2008; Kim, Mirusmonov & Lee, 2010; Mallat, 2007). According to the theory, trialability, complexity, relative advantage, observability and compatibility are the five factors that affect the adoption of an innovation. However, several studies have concluded that only three of the factors; relative advantage, compatibility, and complexity are consistently related to adoption decisions (Agarwal & Prasad, 1998; Low et al., 2011; Sia et al., 2004; Yang et al., 2012). These factors also appear more frequently in research linked to green adoption (Lin & Ho, 2011; Hwang, Huang & Wu, 2016).

Relative advantage captures to what extent the innovation can create an advantage over a previously used product or service (Rogers, 2003). This perceived advantage can be measured in both social and economic terms such as performance, convenience, satisfaction and reputation (ibid, 2003). Relative advantage is positively correlated to the adoption of the innovation as companies are more inclined to adopt an innovation that generates higher economic gains and improves performance compared to the previously used technology (Rogers, 2003; Tornatzky and Klein, 1982). In relation to green adoption, relative advantage has been outlined by Ghisetti et al., (2017) who found that financial barriers can hinder the adoption of environmental innovation and Rahbauer et al., (2016) who pointed out that the perceived high price of green energy and time investment needed can hinder its adoption. Similarly, Hwang, Huang & Wu (2016) who studied the adoption of green supply chains in the semiconductor industry outline that both financial costs and time needed to enable green adoption can be a barrier. Contrary to this, Rusinko (2007) points to economics as a factor that affects adoption but highlights that companies can reduce their costs significantly with green adoption. A previous study claims reductions in the use of natural resources, reductions in the amount of solid waste, and the recycling of production materials can result in considerable manufacturing cost savings (Hwang, Huang & Wu, 2016).

In addition to relative advantage in terms of cost savings, firms can adopt a green supply chain as it can be part of the firm's broader strategies to improve overall business performance and environmental outcomes (Zhu & Sarkis, 2007). It can provide the company with an edge over its rivals in terms of developing a "green" reputation; by nurturing such a reputation, companies can gain additional relative benefits (Rusinko, 2007). This has also been confirmed in studies done on green innovations as Chen Y-S (2008) has acknowledged a positive and significant relationship between the adoption of green supply and company reputation. Similar studies have found similar results suggesting that green practice adoption can be an advantage as it can enhance financial and environmental performance, reduce energy and natural resource consumption, reduce waste and pollutant emissions and create better responsiveness to social and environmental expectations (Etzion, 2007). According to Deif (2011), green manufacturing will also have the potential to improve the quality of the production process which will result in improved product quality and an increased number of customers. Lastly, marketing opportunities can also be a relative advantage as companies that consider the value that green adoption could have on their brand or marketing are more likely to adopt green (Rahbauer et al., 2016; Qin et al., 2022). To conclude, the benefits the green practices offer serves as motivations for companies to adopt them, and researchers expect that relative advantage will positively affect the adoption of green initiatives.

Complexity is defined as *"whether [an] innovation could be easily assimilated or not."*(Liu, Yang, & Lin, 2014) which is the degree to which an innovation is perceived as relatively difficult to understand and use. Complexity is negatively related to the adoption of the innovation as it will increase the difficulty in knowledge transfer and innovation diffusion (Rogers, 2003; Tornatzky & Klein, 1982). Both tacit and explicit knowledge is needed for green practice adoption and makes the adoption of green practices more difficult (Boiral, 2002). Therefore, integration of multiple capabilities and competencies within the organisation is often required and thus, effective knowledge sharing can improve the company's innovative capabilities in terms of higher order learning and, consequently, improve organisational performance including environmental management effectiveness (Lin & Ho, 2011). Thus, reducing the complexity of adopting green practices can positively influence a firm's adoption intentions (Chou, Chen & Wang, 2013; Völlink, Meertens & Midden, 2002).

Compatibility refers to the degree to which an innovation is seen to be compatible and consistent with current values, past experience and the needs of potential adopters (Rogers, 2003). An innovation tends to be adopted more frequently and easily when the innovation matches the adopter's existing processes (Liu, Yang, & Lin, 2014) and operational knowledge (Tornatzky & Klein, 1982). A study made on green adoption has shown that green practices will be more easily adopted within a company when the practices are more compatible with the firm's current technologies and processes (ibid, 2011). Similar results has been shown in a study by Völlink, Meertens and Midden (2002) which shows that green energy is more likely to be adopted if the innovation is consistent with the firm's environmental objectives, aligned with the firms thoughts about effective techniques for encouraging environmental sustainability and compatible with other green initiatives currently in place. Thus, previous research expects that compatibility will positively affect the adoption of green practices (Lin & Ho, 2011).

3.2.2 Organisational factors

Organisational factors have their origins in the theory of Dynamic Capabilities (Teece & Pisano, 2003) and Stakeholder theory (Freeman, 2010). These theories suggest that organisational factors play a significant role in firms' adoption of innovations. Several organisational factors such as organisational culture and support, top management's leadership skills, size of the organisation, and quality of human resources have proved to affect adoption in general (Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990). However, studies made on green adoption have mainly focused on the organisational support, quality of human resources, company size (Lin & Ho, 2011), organisational resources and internal stakeholder (Hwang, Huang & Wu, 2016).

Organisational support is to what extent a company supports the employees using the innovation and entails collaboration between departments. There is consensus that the wider support and collaboration between employees positively affects green adoption (Ramus, 2000; Fu et al, 2018). Organisational support is also closely tied to *management support* and is argued to be influential since it is a precondition for the collaboration between departments in the organisation (Lin & Ho, 2011; Yunus et al., 2013; Messeni Petruzzelli et al., 2011).

Quality of human resources is the organisation's ability to possess qualified employees with competent learning and innovative capabilities. This is outlined as a separate factor as it affects an organisation's ability to adopt green innovations (Lin & Ho, 2011).

Company size refers to the size of the organisation and the influence of it has been commonly analysed (Frambach & Schillewaert, 2002; Kimberly & Evanisko, 1981). The premise that company size positively affects green adoption is additionally confirmed by Gonzalez-Benito (2006) who argue that large corporations more frequently implement environmentally friendly activities as their operations have a higher environmental impact on society and as they face more pressure from stakeholders.

Organisational resources refer to a company's total amount of resources as well as specific environmental resources and capabilities. These resources are related to the organisation's overall infrastructure and how effectively that infrastructure can support adoption (Ensminger et al., 2012). Resources committed to environmental sustainability are vital as green adoption needs particular forms of skills and competencies. Because many environmental issues have complicated technological and legal ramifications, both time and financial resources can be extensive (Hwang, Huang & Wu, 2016). Organisational resources will thus positively affect the adoption of green practices as more resources create better conditions for adopting an innovation.

Internal stakeholders are groups and individuals with decision-making authority in a corporation (Hwang, Huang & Wu, 2016) which can include employees, managers and shareholders. These stakeholders have a significant role in corporate environmental policy and are heavily active in environmental research (Etzion, 2007; Buysse & Verbeke, 2003). As mentioned earlier, green adoption requires the collaboration and coordination of different departments and divisions and management support tends to be the primary factor for successful adoption (Yunus et al., 2013). Individual and institutional shareholders can push an organisation to act more sustainable (Capelle-Blancard & Laguna, 2010). In todays society companies strive to become more green as it tends to improve both the environmental sustainability and business success, and thus, firms can leverage the adoption of a green adoption to indicate their intent to be environmentally friendly (Hwang, Huang & Wu, 2016). Shareholders will support firms' environmental endeavours as long as there is a positive

relationship between economic performance and environmental initiatives (Sharma & Henriques, 2005). Previous research has found that employees' environmental awareness and desire to participate in green efforts are critical to the effectiveness of green initiatives (Ramus, 2000; Sharma & Henriques, 2005). As a result, businesses are more likely to engage in environmental practices when their employees are involved.

3.2.3 Environmental factors

Environmental factors can be derived from institutional theory and concern how businesses respond to institutional pressures (Scott, 1995). According to Scott (1995), institutions can constrain firms' behaviour by defining cultural, moral and legal boundaries and separating lawful from illegitimate actions and activities. Constraints can be of several forms such as normative (imposed via codes of conduct or certification), regulative (enforced by laws, rules and sanctions) or cultural-cognitive (common beliefs) (ibid, 1995). In general, studies have increasingly agreed that external pressure has a key role in influencing the adoption of green practices (Alvarez-Gil et al., 2007; Rivera, De Leon & Koerber, 2006; Kassinis & Vafeas., 2006). Several factors such as pressure from different stakeholders, environmental uncertainty, environmental munificence, governmental support, competition, network relations (Frambach and Schillewaert, 2002; Jeyaraj, Rottman & Lacity, 2006), external resource availability and environmental uncertainty have been discussed in the literature of technical innovation (Jeyaraj, Rottman & Lacity, 2006; Tornatzky & Fleischer, 1990). However, studies within green adoption have mainly focused on the influences of stakeholder pressure, governmental support and regulation, and environmental uncertainty (Lin & Ho, 2011; Hwang, Huang & Wu, 2016).

***Stakeholder pressur*e** is regarded as the most prominent factor affecting a company's environmental strategy (Buysse & Verbeke, 2003; González-Benito, 2006). Organisations carry out actions to please their primary stakeholders according to stakeholder theory. Customers and regulators are among the most important stakeholders among several kinds of stakeholders (Christmann, 2004; Etzion, 2007; Vachon, Halley & Beaulieu, 2009) and have been shown to accelerate green adoption in particular (Christmann, 2004; Guoyou et al., 2013; Hsu et al., 2013; Hwang, Huang & Wu, 2016). Stakeholder pressure is also commented on in relation to the social expectations, norms and outlined codes of conduct that can make a

company feel a social obligation to society (Jones, 1999). Studies claim that social norms (Qin et al, 2022), community (Hwang, Huang & Wu, 2016) and cultural boundaries (Hsu et al., 2013) positively affect the green adoption of corporations. As environmental sustainability has increasingly become a public concern, firms are incentivized to consider their social responsibility. This is a factor that plays a significant role in green adoption as it aligns with the values and obligations of the societal context in which companies act (Guoyou et al., 2013).

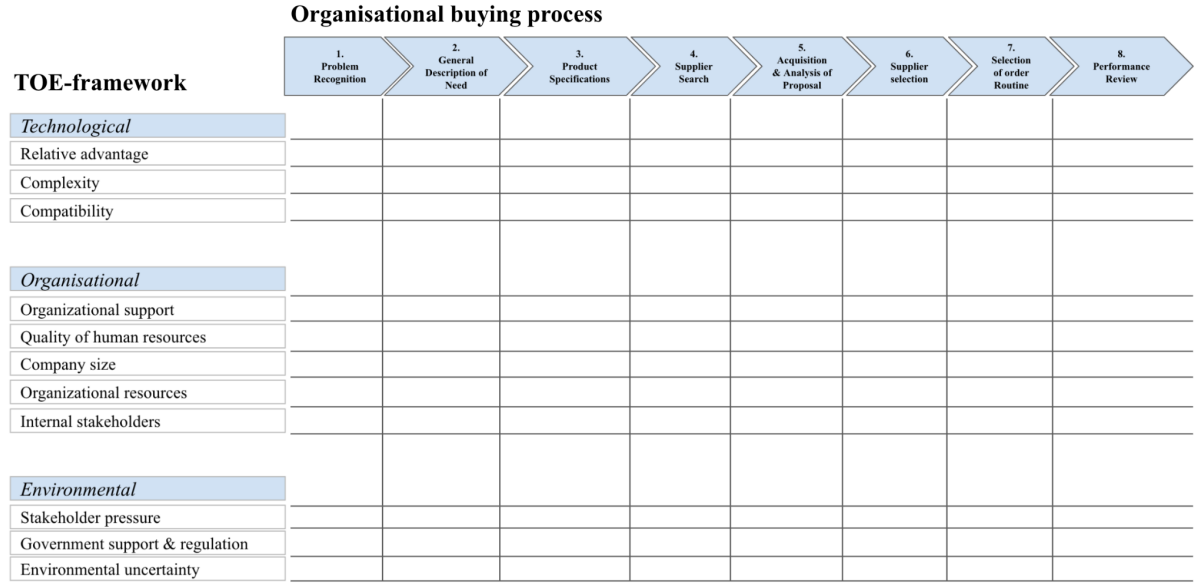
Governmental support and regulation is another factor of great importance as technical innovation to some extent is reliant on available external incentives such as government policies. This is also the case for green adoption as the regulation and subsidies that governments put in place can affect the adoption of green practices. For example, Lin and Ho (2011) studied what factors affected the adoption of green practices found that regulatory pressure affected the usage of green practices. Governmental incentives may take forms such as policies regulating or stimulating training programs, technical resources, pilot projects and financial incentives (Scupola, 2003; Tornatzky & Fleischer, 1990). Financial incentives in particular can include cheaper financing for green technologies, lower insurance premiums, government subsidies or tax incentives (Aragon-Correa & Sharma, 2003). The external incentives can either aim to increase demand for the green adoption or decrease the demand for their non-green counterparts through e.g. sanctions and other restrictions (Hwang, Huang & Wu., 2016).

Environmental uncertainty refers to "the frequent and unpredictable changes in customer preferences, technical advancement, and competitive behaviours" and is expected to increase the likelihood of green adoption (Lin & Ho, 2011). The underlying logic is that firms that act in uncertain business environments are more proactive and utilise strategies that are more innovative which include green adoption (ibid, 2011).

3.3 Proposed theoretical framework

The proposed theoretical framework used in this master thesis combines the two frameworks described above, the *Organisational Buying Process* and the *TOE framework*, into one integrative framework with two axes. The X-axis outlines the buying process and the Y-axis lists the factors affecting the buying process. By doing so, the framework allows us to both examine how corporations with operations in Northern Europe buy rooftop solar PV, examine what factors that influence the PV buying process and how those factors influence the process. Thus, the framework will aid in answering the research questions of this master thesis and is presented below (Figure 4).

Figure 4 - Proposed theoretical framework



4 Method

This section outlines the design and approach of the study. Subsequently, it outlines the data collection and analysis and finally comments the quality of the study and ethical considerations taken.

4.1 Research design and approach

4.1.1 Qualitative design

In order to answer our main research question *"How do corporations in Northern Europe buy rooftop solar PV?*" and the two sub-research questions *"What factors affect the buying process for rooftop solar PV?"* and *"How do these factors affect the buying process for rooftop solar PV?",* a qualitative approach with semi-structured interviews was used.

The purpose of this master thesis is to create a greater understanding of how corporations buy rooftop solar PV by outlining the buying process, what factors affect it and how. Given this purpose, this research does not aim to generalise the results but rather to gain a deeper knowledge of the research area that has an impact on the organisational behaviour in the buying process (Bryman & Bell, 2011). To answer this question, a qualitative approach is required to gather insights and contextual knowledge in this relatively novel research area where theory is yet to be built. As this master thesis contributes to developing and building new theories rather than only evaluating existing ones, a qualitative research design is more appropriate (Gibson & Brown, 2009). The choice of research method is also justified by Blackwell, Miniard and Engel (2006) who argue that purchase decisions are difficult to explain even by the subjects that perform the purchase which favours a qualitative approach.

4.1.2 Research design

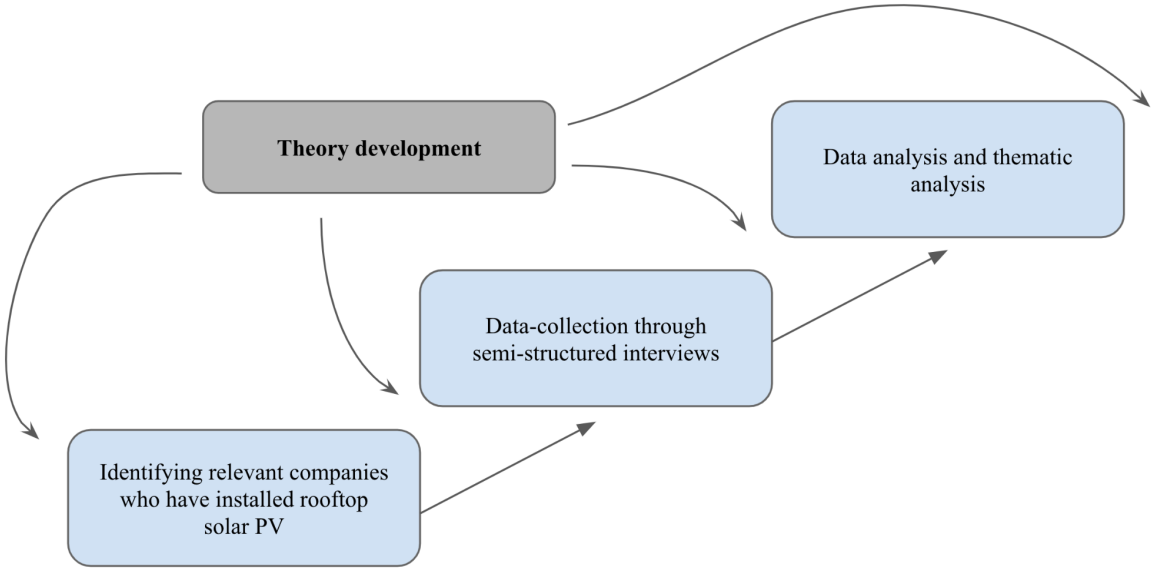
The choice of semi-structured interviews is justified by the need to gain deeper knowledge and understanding of the organisation's buying processes, in which it is favourable to utilise open research questions (Silverman & Marvasti, 2008). Additionally, semi-structured interviews are useful for gaining a more profound understanding of people's personal

experiences as the method allows researchers to ask follow-up questions, probes and comments (DeJonckheere & Vaughn, 2019). It provides the respondents with certain directions and guidance that guarantees that the information collected is consistent, while also allowing the respondents to freely elaborate on their answers linked to their buying process of solar PV. In order to emphasise the respondents to be free in their answers, we explicitly mentioned at the beginning of the interview that the respondents should "feel free to speak freely about what you think is relevant with regards to the themes that we introduce". This allowed for a discussion with the interviewee when asking questions within pre-determined themes, but also gave the opportunity to pose follow-up questions if the need arose (Longhurst, 2010). According to Bryman and Bell (2011), this interview technique also creates a fluid and flexible environment in which respondents may freely express themselves and discuss their subjective impressions. An interview guide was created, consisting of a list of themes with a set of questions related to each theme to ensure a smooth and valuable interview (see appendix 1). The semi-structured interviews were performed with both the two authors present. In this way, one of the authors took an active role in asking the majority of the questions and the other had a more supportive role and focused on taking notes. This is beneficial because the active interviewee could pay all their attention to the interviewee instead of simultaneously focusing on taking notes and thus the interviewer could be more attentive, asking more suitable prompt and follow-up questions.

4.1.3 Abductive approach

Through an abductive approach, this master thesis intends to both develop and build new theories as well as evaluate existing ones (Dubois & Gadde, 2002). Further, as abductive approaches include a continuous interplay between empirical observations and theory, our proposed conceptual framework has been successively modified as a result of the empirical findings and the theoretical insights gained (Dubois & Gadde, 2002). The fashion in which this has been done is outlined in Figure 5 below. One example of this is when the data collected indicated that factors relating to the *supplier*, and not the *technology*, *organisation* or *environment* as listed in the original framework, had an effect on the OBP. Therefore, the category *supplier* was added to the framework. This is outlined further in section *5.2 Empirical findings for factors affecting the buyer process.*

Figure 5 - Visualisation of our research design based on Dubois & Gadde, 2002



4.2 Data collection

4.2.1 Interview sample

In terms of the sample size, researchers should strive for a sample size that offers the information needed to meet the study's objectives (Brinkmann & Kvale, 2015). For this master thesis, 50 companies were contacted with a total number of 76 outreaches. This resulted in 17 semi-structured interviews (Table 2). However, only 16 interviews were included in the study since one interview was omitted from the sample as it was interrupted after 18 minutes and did not have a high enough quality to be included. Regardless, the sample of 16 interviews was sufficient as we reached a point of empirical saturation. This was indicated by the answers we received from both respondents 15 and 16 as neither of them highlighted new steps in the buying process or factors that affected it but merely confirmed already existing ones. According to Hennink and Kaiser (2021), qualitative research often reaches empirical saturation at relatively small sample sizes if the objective of the study is narrowly defined as is the case of this master thesis.

We primarily aimed at interviewing people who had been overall responsible for the procurement of the rooftop solar PV system. These respondents varied in roles from energy managers to directors. If there was not a single individual at the company that was

responsible for procuring the solar PV system, we aimed at interviewing several employees that had been involved in the project. However, this was only the case for one company that participated in the study as the respondents at the remaining companies included in the master thesis had been overall responsible for the rooftop solar PV project.

Out of the 16 interviewees, seven were conducted in English and the remaining nine were done in Swedish. Due to covid-19 and the geographical spread of the participants, all interviews were done virtually via Google Teams. According to Shapka et al., (2016), data quality is unaffected by the mode of data collection (online versus in person) and thus, conducting the interviews online was deemed further appropriate. However, we do acknowledge that some of the non-verbal cues may be missing as they were difficult to grasp in the digital setting.

All interviews were recorded with approval from the respondent with an average time of 41 minutes which allowed for enough time to cover the predefined themes and collect in-depth empirical data. All interviews started off by confirming confidentiality, anonymity and that the data will be handled according to best practice in line with EU's GDPR in order to get open and honest answers. All interviews were transcribed within three days after each interview which allowed us to retain a good recollection of nonverbal cues and other interesting insights. The transcription was initially done through transcription software. However, the software wasn’t accurate word by word and thus the interviews were listened to and corrected so that the analysis could be conducted. Furthermore, all transcribed interviews were provided to the respondents for approval and allowed them to address any confusion or clarifications if needed.

Table 2 - Participants in the study

Code	Company alias	Time (min)	Date	Country	Interviewee title
Respondent 1	Company 1	62	2024-02-22	Netherlands	Sr Category Manager FM Europe
Respondent 2	Company 2	36	2022-02-25	UK	Senior Energy Consultant
Respondent 3	Company 3	33	2022-02-25	UK	Energy Manager
Respondent 4	Company 4	53	2022-03-07	Sweden	Construction manager
Respondent 5	Company 4	43	2022-03-10	Sweden	Project Manager
Respondent 6	Company 5	24	2022-03-09	Sweden	CEO
Respondent 7	Company 6	38	2022-03-14	Netherlands	Global Renewable Energy Programme Manager
Respondent 8	Company 7	45	2022-03-15	Sweden	CEO
Respondent 9	Company 8	48	2022-03-15	Sweden	Property Manager
Respondent 10	Company 9	35	2022-03-16	Sweden	Director
Respondent 11	Company 10	47	2022-03-17	Sweden	Category Manager Capex
Respondent 12	Company 11	39	2022-03-21	Sweden	Renewable Energy Lead
Respondent 13	Company 12	44	2022-03-22	Norway	Project Manager
Respondent 14	Company 13	37	2022-03-23	Sweden	Board Member
Respondent 15	Company 14	31	2022-03-30	Sweden	Warehouse Director
Respondent 16	Company 15	43	2022-04-01	UK	Global Climate Lead

4.2.1 Interview design

All interviews started with a couple of warm-up questions regarding the roles and responsibilities of the respondents in order to make them feel comfortable. This smoothly transitioned into questions more connected to the aim of the thesis by starting to talk about renewable energy and rooftop solar PV. Subsequently, the interview transitioned to asking about a recent rooftop solar PV project that the interviewee had an active role. This section covered what the buying process looked like for their organisation, what factors affected the buying process and how. The interviews were wrapped up with some concluding questions with regards to their learnings about their buying process and if they wanted to add anything that we hadn't already asked for.

4.3 Data analysis

The collected data was analysed through a *thematic analysis* which is widely used within qualitative research. It allows for rich data collection to be both described in detail and organised in accordance with identified patterns (Braun & Clarke, 2006). The six-phase guide outlined in Table 3 was used to guide the thematic analysis and was originally proposed by Braun and Clarke (2006) as a suitable way to conduct the analysis. Even though Table 3 describes the process as six subsequent steps, Braun and Clarke (2006) note that the process of performing a thematic analysis might not be linear. Instead, it can be thought of as an interactive process of going back and forth between phases prior to defining the final version of the themes that are analysed and discussed with regard to the research questions and the previous literature. We used Microsoft Excel to do the coding system in two steps. Firstly, we highlighted the OBP (Table 4) and secondly, the potential factors affecting the buying process (Table 5).

Table 3 - Phases of thematic analysis. Source: Braun & Clarke (2008)

Phase	**Description**
1. Familiarising with the data	First phase comprises transcribing all interviews and noting down initial ideas and similarities across interviews
2. Generating initial codes	Second phase comprises reading through each transcript and coding them in accordance with a colour system which categorises relevant data for each code
3. Searching for themes	Third phase comprises categorising codes into initial themes
4. Reviewing themes	Fourth phase comprises reviewing identified themes and the previous literature
5. Defining and naming themes	Fifth phase comprises generating and naming themes after their content and meaning
6. Producing the report	Sixth and final phase comprises reviewing each theme and selecting representative extracts and writing the report in which each theme is analysed in relation to the research questions and the previous literature

4.3.1 Data analysis of Solar PV buying process

Via coding and later thematizing the steps in the buying process for solar PV, eleven codes that occurred in chronological order were identified (Table 4). These codes were clustered based on similarities which resulted in four main themes that followed a chronological order. These four themes laid the foundation for how this master thesis conceptualises the rooftop solar PV buying process. This framework later laid the ground for the subsequent analysis of understanding how the factors affected the buying process. An example of this is the following when describing the opportunity with renewables within the second theme: *Selection of business model and scope.*

Respondents mentioned that they identified several business models to procure solar:

"And and we identified different procurement routes with different credibility"
- Respondent 3

Additionally, respondents also mentioned that they conducted an analysis to determine the scope of the solar projects:

" ...which is, you know, to go out, verify the feasibility of the roofs, structural integrity, confirm grid connection capacities and all that sort of thing. So to fully de-risk the projects, and once we have understood on which building can we install, then we go out to the market and ask" - Respondent 7

These two codes were merged into the theme "*Selection of business model and scope*" (Table 4). The aforementioned process was used to form the remaining themes which are commented on in subsequent sections of this chapter.

Table 4 - Codes and themes of solar PV buying process

Codes	Themes
1.Problem or opportunity recognition for renewables	1.Decision to procure rooftop solar
2.Selection of type of renewable source	
3.Selection of solar installations archetype	
4.Selection of business model	2.Selection of business model and scope
5.Offering specifications	
6.Evaluation of suppliers and received tenders	3.Finding, evaluating and selecting a supplier
7.Choice of supplier	
8.Negotiation of terms	
9.Preparation for construction	4.Onsite preparations, construction and maintenance
10.Construction	
11.Operations & Maintenance	

4.3.2 Data analysis of factors affecting the Solar PV buying process

The coding process for identifying and mapping the factors that affected the buying process of solar PV followed the six steps outlined by Braun and Clarke (2006) and was aided by the factors included in the proposed conceptual framework presented in chapter 3.

Firstly, the interviews were coded based on the expressions of the respondents. In this particular step, we limited the attempts to filter them which resulted in 105 first-order categories. For example "*But we also said there is value in there for our company to show our customers that we are actually at a renewable generation*" (Respondent 1) was categorised as "Value to show solar to customers".

Secondly, the 105 first-order categories were compared against each other on similarities and differences that ended up with merging the first-order categories into 20 codes. Using the example in the previous paragraph, the first-order category "*Value to show solar to customers*" was coded as "*Branding*" along with other similar codes that indicated a value of showing solar to customers.

Thirdly, an interpretative process in which we compared the existing theory to the codes that had emerged from the data analysis was conducted. This exercise resulted in the 20 codes becoming four themes. For instance, the code "*Branding*" was included in the theme "Technology" as it referred to an opportunity from the visibility of a rooftop solar PV plant.

Table 5 - Factors affecting the buying process of Solar PV

Themes	Codes
Technology	Additionality
	Complexity
	Financials
	Branding
	Product specifics
	Resilience
	Risk mitigation
Organisational	Compliance
	Corporate identity
	Sustainability
	Internal resources and capabilities
	Site characteristics
Environment	Government regulation
	Stakeholder pressure
Supplier	Durability supplier
	Supplier characteristics

4.3.3 Significance and frequency of factors

During our empirical findings and analysis, we will not touch upon all factors in our new conceptual framework (presented in 6.3 New proposed theoretical framework). Instead, we will narrow our focus by selecting the factors that appeared most frequently and were perceived as most significant in the solar PV buying process. Frequency encapsulates how often a factor is mentioned to affect the OBP and significance indicates how significant each factor was in affecting the OBP. Both frequency and significance are taken into account when deciding what factors to analyse, as we exclude the less frequent and significant factors from the analysis due to the scope of the thesis.

4.4 Quality of study

According to Guba and Lincoln (1994), the study's quality assessment should be based on the notion of *trustworthiness* which is based on four criteria consisting of *credibility, transferability, dependability and confirmability*.

4.4.1 Credibility

In qualitative research, credibility is about the truth-value of the findings and the extent to which the conclusions reflect reality (Yin, 2015). According to Guba and Lincoln (1994), researchers must ensure that there is adequate correspondence between the insights provided by their respondents and their results. To ensure credibility, the study was carried out according to the principles of good practice. This was done by making sure that all data was appropriately interpreted by forwarding all transcribed materials to the interviewees and allowing them to edit the transcribed material.

4.4.2 Transferability

According to Guba and Lincoln (1994), transferability refers to the study´s ability to reach a wider audience in which findings can be transferable and used in other contexts. Although the findings in this study cannot be directly transferable and generalised to other contexts, we believe that transferability is warranted in two ways. Firstly, given that detailed contextual information has been provided, it allows future research to apply these findings to a variety of settings and scenarios. Secondly, given that the sample included in the study consists of solar projects in four countries in Northern Europe, we do believe that country-specific dimensions (e.g. domestic laws and regulations) are as prevalent which increases transferability.

4.4.3 Dependability

To ensure dependability, the researchers have made it possible for others to observe the research design and verify that the method was followed and executed in a proper manner (Guba & Lincoln, 1994). Dependability is further achieved by the recording of an auditing trail which can be scrutinised.

4.4.4 Confirmability

Confirmability includes that the researchers have acted in good faith and that the data and interpretations of the findings are not figments of the inquirer's imagination but derived from the data (Guba & Lincoln, 1994). Thus, it should be evident that neither personal values nor theoretical preferences have been permitted to clearly affect the research or its findings by the researchers (Bell, Harley & Bryman, 2022). Confirmability was achieved by including open questions during the interviews, transcribing all of the material, and double checking the coding against the transcriptions.

4.5 Ethical considerations

Vetenskapsrådet (2002) has developed four research ethics principles intending to provide norms for the relationship between researchers and respondents. To ensure that the research was carried out ethically, the four principles of 1) information requirement, 2) consent requirement, 3) confidentiality requirement and 4) use requirement (ibid, 2002) were taken into account during the interviews.

In accordance with the information requirement, the interviewees were prior to the interviews informed about the purpose of the study, their role in it and how their answers would be used. We informed the participants of all necessary information that could reasonably affect their willingness to participate prior to the interview. In compliance with the consent requirement, all respondents gave their approval on a voluntary basis to participate in the interviews and their permission to record the interviews was requested beforehand. Additionally, all respondents were treated with respect during each interview, and their freedom to refuse to answer questions with which they were uncomfortable was respected. In order to ensure confidentiality, this was ensured at the beginning of the interview that all answers will be confidential. Finally, in order to comply with the use requirement, the respondents' data was only utilised for the purpose of this study and not for any other reason (ibid, 2002).

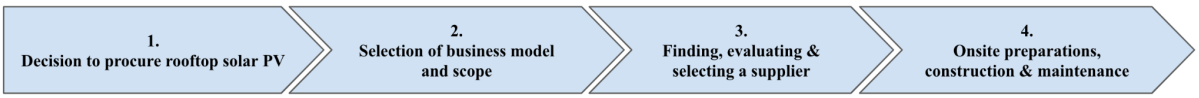
5. Empirical findings

The empirical findings from the master thesis will be presented in this section in two parts. Firstly, the rooftop solar PV buying process will be presented in further detail. Secondly, the identified factors and how they affect the rooftop solar PV buying process will be outlined. The empirical findings are supported by quotes from the interviews in the running text and additional quotes that support the findings are found in Appendix 2.

5.1 Empirical findings for solar PV buying process

The rooftop solar PV buying process consists of four distinct steps that are: (1) Decision to procure rooftop solar, (2) Selection of business model and scope, (3) Evaluation of suppliers, (4) Onsite preparation, construction and maintenance (Figure 6). Each of these steps will be further elaborated on below.

Figure 6 - Organisational buying process based on empirical findings



5.1.1 Decision to procure rooftop solar

The first stage of the buyer process is initiated by either realising an opportunity with rooftop solar PV or realising a problem that can be partially solved with the innovation. Opportunities include that companies have large accessible roofs that can be used to produce electricity.

"We have a lot of, let's say, roof surface we can utilize in some plants" - Respondent 7

Another opportunity, apart from accessible roofs, is that the companies consume a lot of energy and that companies therefore strive for opportunities to reduce the cost of the energy.

"We are large energy consumers to start off with, so the question (rooftop solar PV) has always been highly relevant for us" - Respondent 10

and

"I say primarily avoiding electricity costs“ - Respondent 2

Another opportunity includes realising that one can increase the quality of the renewable energy with additional green energy from rooftop solar PV.

"We do like to invest in solar panels because the quality is higher, it's more visible, it's high quality and it's also additionally" - Respondent 1

Apart from opportunities, respondents also listed problems that could be partially solved with rooftop solar PV. This was for example that the current electricity prices had increased.

Actually, it started with monitoring your electricity price whilst it gets higher. And then you want to consider different options” Respondent 14

Apart from the increased prices, capacity shortage on the electricity grid was also mentioned as a problem that companies tried to solve through procuring rooftop solar PV.

"We have seen for a long time and heard from others in the industry that its a challenge to get enough power to the facility as there is not enough power on the electricity grid” - Respondent 5

5.1.2 Selection of business model and scope

This stage includes making a decision with regards to what business model to use and what facilities to include in the scope of the rooftop solar PV project. When deciding what type of business model to choose, some respondents evaluated several business models.

"We identified different procurement routes with different credibility" - Respondent 3

Other respondents did not consider alternatives. This may be due to several reasons, but the main factor that several respondents mentioned was that one business model fitted their current needs better.

"Essentially, no, we are not considering alternatives"
- Respondent 3

and

"And so we then effectively sign a PPA with them, which alleviates the operational pain of us operating, owning and operating something which is not part of our core business." - Respondent 7

Regarding identifying the scope, respondents usually start by doing a feasibility study.

"So we really started about the kind of feasibility study. Not sure if we could do it. So we started step by step." - Respondent 1

However, the majority of the respondents needed to rely on external help as they did not possess the internal knowledge required to determine the scope of the project.

"So we have a third party that we use who does a desktop study and identifies how much we potentially could get on-site" - Respondent 11

Some respondents evaluated both the business model and scopes together rather than deciding on one of the parameters before advancing in the buying process.

"We have three different suppliers that came with three different concepts and scopes." - Respondent 15

5.1.3 Finding, evaluating and selecting a supplier

This stage refers to finding, evaluating and choosing a supplier. When finding and evaluating suppliers, some companies have more structured methods than others. For example, one of the companies developed a database where they sourced suppliers.

"What we did with the team was to develop a kind of database. Which suppliers do we have? What is the maturity of the supply?" - Respondent 1

However, other companies relied on a desktop study and had a less structured approach.

"We don't actually go into huge detail. So we will take recommended suppliers from the company that does the benchtop desktop study." - Respondent 11

Whereas other respondents went with existing suppliers.

"You must do that and they'll have preferred suppliers within the companies we've worked with before and certain types of technology and support and structures in terms of what's most cost effective" - Respondent 16

How the companies evaluated their suppliers differed significantly. Some of the companies mentioned that they had learnt a lot from buying their first rooftop solar PV plant and that the subsequent purchases were easier to conduct.

“When we had bought one solar plant, it was easy for us to just run a tender process. It was so much easier when we had learnt and understood” - Respondent 10

Many respondents indicated that they needed a partner that could help them develop the project together.

"We had the ambition to see if we could develop something. So it was really a partnership development where we work together." - Respondent 1

However, as companies matured, the prioritised competition rather than having a partnership approach.

“Before I started there were projects which were kind of solicited on a partnership basis where, you know, companies have approached the company and said, Look, we can do this for you. And the company has taken that on and they have started working together. But in my previous experience, it's also proving another that doesn't produce the best outcome for the company. So what you need is competition on an arm's length basis, which means you have to have a fully fledged tender to have leverage over whoever you are working with in the end. And that's to get the best technical outcome as well as financial outcome - Respondent 7

5.1.4 Onsite preparations, construction and maintenance

This stage involves preparing the site for the construction, installation of the solar panels and lastly their operations and maintenance over the product life cycle. Preparing for construction usually involves informing relevant stakeholders that are likely to be affected by the solar PV plant. This includes a wide array of stakeholders ranging from plant engineers to the legal department.

“Of course, you have operational teams where there are, let's say, the plant engineers, electrical engineers, and environmental departments. And so that's that's the plant itself. Of course, then the management team on a plant level and then more on a group level, again legal in so risk, which is covering insurance in our case and then we have finance. Tax accounting. Those are the kind of. And then when it comes down to when we're over the line, hopefully communications” - Respondent 7

The construction of the rooftop solar PV plant involves receiving the relevant materials at the site and managing the external workforce that will construct the solar PV plant. This can be done internally if the company has the knowledge.

"As we have engineers that are good at this, we appointed an internal project manager who could control that everything was done as it should” - Respondent 14

However, the construction, operations and maintenance is sometimes managed by an external party who takes care of the construction and carries out the operations and maintenance.

"It is a separate party that does the ongoing operations, service, and maintenance. It is a service we buy" - Respondent 4

The operations and maintenance of the solar PV plant usually revolves around making sure that the solar PV plant produces electricity as it should.

"I can go in and see exactly what we have produced each hour or today or last year. It is a crucial factor when choosing a power plant, to have a simple but clear monitoring so that you get what you have been promised. That it generates both the reduced CO2 emissions and the economics that you have been promised" - Respondent 15

5.2 Empirical findings for factors affecting buying process

5.2.1 Factors affecting the decision to procure rooftop solar

There are mainly three *technological* factors that affect the decision to procure rooftop solar. These factors are *financials*, *branding* and the *risks* associated with installing and having operational solar PV plants.

Firstly, many respondents list *financials* as one of the main reasons why they considered rooftop solar in the first place.

"Value of solar is that it is a cost saver: And typically what we're trying to do, the economic justification of these projects is to, yeah, they're effectively a cost saver in net terms and to the business" - Respondent 7

Many interviewees also claim that the increasing financial savings for solar PV have increased the collaboration between departments throughout the buyer process:

“Now, it's a completely different situation when it's financially viable to do these projects. Now, all departments understand why we’re doing this. So now even the financial department is driving this whilst it was only the sustainability team previously.” - Respondent 10

Some interviews also listed *financials* as a factor that fundamentally affected their decision to install solar panels, meaning that they would not consider installing solar panels unless the project was profitable:

"You've shall say maybe that this means that when the (financial) outlook is negative for a site in the project, we do not proceed.” - Respondent 3

Secondly, many respondents listed the *branding* as another main reason as to why they engaged in rooftop solar PV projects.

“But we also said there is value in there for our company to show our customers that we are actually at a renewable generation” - Respondent 1

The effect that the opportunities had on *branding* was similar to that of the financial savings as it enabled better collaboration across departments to realise the rooftop solar PV projects.

“An important question in marketing is that you talk about sustainability. It wasn't like this before when you just wanted to sell hot dogs and balloons to the cheapest price. Currently, sustainability is crucial when building brands so all of a sudden all departments have an interest to make this work and that becomes a driving force” - Respondent 10

The final technological factor that affected the decision to procure solar was the risks associated with installing and having operational solar PV plants. Many respondents expressed a fear that the roofs might collapse due to the increased weight on the roof due to the solar panels which were examined by testing the roof strength.

"We also look at the technical possibilities, which is also important, especially for rooftop solar panels. It's obvious you should do some test if the roof is strong enough to support the weight of the solar panels" - Respondent 1

Even though these tests were performed, some respondents were still worried about what might happen when the snowload might increase.

"I'm really worried for when the cold winters are coming and how one will handle the removal of snow in reality. It's a challenge that the industry has" - Respondent 8

Additionally, several respondents listed that there was a risk that the panels would catch fire.

"Fire protection for a consequence is an important thing to look at and to clarify a little bit because there is a lot of scepticism that the solar panels itself could catch fire"
- Respondent 1

Related to operational *risks*, some respondents claimed that the decision to install solar was affected by what types of sites the company had. For example, sites with less operational value were prioritised.

"So where we have active production or hot work going on underneath, we don't go. So typically we're trying to only go, let's say what we call the cold end or logistics and warehouse buildings." - Respondent 7

All of these *risks* affected the buyer process negatively by creating doubt regarding the value the solar PV plant could bring in relation to its potential *risks*. Ultimately, some respondents decided to not install solar panels on important production sites as they considered the risk to disturb production flows too high.

The *organisational* factors that affected the decision to procure rooftop solar are that solar PV is considered part of a *corporate identity*, that it creates value in *sustainability* and that the company's facilities had *site characteristics* that were suitable for rooftop solar PV. All of these factors positively affected the decision to procure rooftop solar.

The factor that solar aligns with the *corporate identity* included that many respondents believed that solar PV was something that was consistent with their values and the profile they wanted to show to varying stakeholders including clients and employees. This factor motivated the respondents to install rooftop solar and acted as an additional value that positively affected the buying process.

"It is about that we have a green profile. Or we are saying that we do, and then we have to live up to that statement" - Respondent 9

Having a *corporate identity* that aligns with the expectations of stakeholders was also considered. This was demonstrated by several respondents who claimed that they needed to show integrity in improving their green corporate identity, or else they could not expect their partners to act sustainably as well.

"We are not only telling our suppliers what they need to do, we also need to demonstrate that we are doing it. I would not be surprised if some of our customers also put those requirements on us. As we are working to put those requirements on our suppliers, of course our customers will be putting those kinds of demands on us as well. They will not accept in the near future that we say OK, we don't care about what kind of energy we use. We just buy the cheapest out of the market, that acceptance becomes less and less." - Respondent 1

Secondly, many respondents also list the value of *sustainability* that solar PV plants create as a factor that made them consider installing rooftop solar panels.

"On a high level, it's about wanting to reach our sustainability targets and be green" - Respondent 12

There is also a clear link between rooftop solar PV and the overall sustainability ambitions that the companies have set.

Yes but this is our agenda and focus on sustainability which is one of our core values…then we have to make these efforts. " - Respondent 12

Some respondents also differentiated between procuring green energy from the grid and producing onsite renewable energy with additionality.

"You know, it's looking at what's best for the planet and can we actually have a bigger impact than just buying certificates?" - Respondent 1

Similarly to the effect that *financials* have on the rooftop solar PV buying process, seeing a strong sustainability value in combination with strong financial incentives became a driving factor to install more rooftop solar.

"In principle, the driving factor is that we want to be good in environmental work and that there are savings to be made by being good at that. That combination works, like when there is both a financial upside and something that is good for the environment. That is when the real speed comes". - Respondent 4

The last organisational factor includes that the respondents realised that they had suitable facilities for solar and that that triggered the decision to procure solar PV. This code is mentioned as *site characteristics* and includes suitable roofs and electricity consumption.

"We have a lot of, let's say, roof surface we can utilise in some plants, also some ground plant areas and wherever possible. Typically, when we look at on site opportunities, it very quickly goes into the megawatt scale" - Respondent 7

Another important site characteristic is that there is significant electricity consumption at the site as it affects the financial feasibility of the solar project:

"What builds the whole business case is that we can consume the electricity that we produce" - Respondent 9

The combination of these two factors, namely large roofs and significant electricity consumption was also explicitly mentioned when asked why the respondents considered rooftop solar in the first place.

"The main factors were that we have large roofs and we use the electricity" - Respondent 6

The main *environmental* factor that affected the decision to procure rooftop solar was the *government regulations* and the *environmental uncertainty*. *Government regulation* was primarily mentioned as a positive factor as it incentivises companies financially to invest in solar panels.

"One more element as well is local subsidies sometimes make them (rooftop solar PV plants) attractive. So in some locations you can get advantageous kind of tax breaks by putting on-site renewables. And that's because, say, the grid is not very resilient there. Actually, you'll get a tax break by just taking the pressure off the grid if that locally is under a lot of pressure." - Respondent 16

However, it was also listed as a negative factor as some expressed that solar wasn't as financially attractive as the subsidies had been removed.

" ...the change that there wasn't as much subsidies for solar. So we didn't install any for a couple of years." - Respondent 2

Lastly, some expressed uncertainty regarding whether the favourable policies for rooftop solar PV would sustain in the future.

"There is a consultation that has the potential to decrease the value of any behind the meter generation. They are essentially in the UK proposing to move some policy cost taxes from the electricity bill to either the gas bill or general taxation, which would could be good for the

general wider good. But for behind the meter generation business case is it's not good" - Respondent 3

Uncertainty regarding future subsidies related well to the second theme, *environmental uncertainty*, which many listed as supporting the decision to procure rooftop solar PV. The primary reasons for uncertainty were the availability and price of electricity in the future. As the availability of electricity has decreased and the prices have increased, many respondents expressed a wish to control a part of their electricity costs and increase their resilience to future blackouts.

"As we are shutting down nuclear power plants, the power market becomes more volatile.. ..so it is also a security factor to hedge a part of the electricity price" - Respondent 14

Having secured energy supply was also a factor that was mentioned to increase the resilience at the site which could improve the quality of production.

"So at the moment for our sites we see a limitation to that. But still even if it's only 5 to 10% of the site's power needs, it does improve some of the resilience of the site…and you know, when you're making very expensive products, the criticality of some energy resilience is really high because a short shut down might mean a whole batch has to be destroyed." - Respondent 16

5.2.2 Factors affecting the selection of business model and scope

There were mainly two factors affecting the selection of business model and scope: *internal resources and capabilities* and *site characteristics*. Firstly, the *internal resources and capabilities* including available resources, available staff to manage solar projects and knowledge and capabilities for the operations and maintenance proved to be important when considering what business model to choose.

In terms of deciding on what business model to use, there was a negative relationship between having available resources and choosing a TPO business model in which a supplier would be responsible for the initial investment.

"So there's I don't know how legitimate that we've never actually pushed on trying to do that (use of third-party Financing) because the access to capital has been very positive. " - Respondent 15

Contrary to this, other companies outlined the value of third-party financing as they could then invest their own capital into other projects.

“Having investing means actually there is more money left for us to invest in other projects” - Respondent 1

Additionally, not having available staff to manage the solar projects has a positive effect on the use of a third-party business model.

“We would not have capacity to maintain those solar panels. So these are the various reasons why we would not like to (use ownership business models), because it's not our core business to install solar panels.” - Respondent 11

If, however, the company has already hired personnel with the necessary capabilities to manage rooftop solar projects, the value of the outsourced workload diminishes which support the use of *ownership* business models.

“We also have the knowledge. We have the people that can run the solar panels." - Respondent 13

Secondly, factors such as *site characteristics* including operations at the site and the electricity consumption as well as *government regulation* regarding the sizing of solar PV plants were critical when deciding the scope of the solar PV projects.

“Operations at site included staying away from sites where one had active production” - Respondent 7

Moreover, having a high electricity consumption was mentioned as a factor affecting the scope as it was outlined as important to consume the energy one produced with solar PV:

"The first thing you need to find is how much energy would you like to produce and how much energy do you use yourself?" - Respondent 13

Additionally, having roofs that could take the weight of the solar panels was also mentioned as a factor that affected the scope of the project:

"We know that the structural and leading limits of the roof are going to be OK. We do get them checked each time" - Respondent 2

Lastly, *government regulation* that limited the financial incentives to size power plants also affected the scope of the project.

"What build the whole case for us is that we consume the electricity that we produce. We also needed to adhere to the 255 kW law" - Respondent 9

5.2.3 Factors affecting the finding, evaluating and selecting a supplier

There were primarily four categories of factors that affected finding, evaluating and selecting a supplier: *product specifics*, *compliance*, the *supplier durability* and *supplier characteristics*. The first category was the *product specifics* in which the companies primarily looked at the best available price and previous experience to determine what supplier to choose.

"Then we would choose on a few criteria of obviously price being the first one experience as well. You'd see case studies and portfolios of what they've installed before, what kind of buildings, under what conditions and working with what kind of partners"

- Respondent 2

A second product specific feature that also affected their choice of supplier was if it provided a good digital interface to monitor the production of the solar PV plant once it was operational, as this was relieved when asking what features clients demand:

“What kind of software do they use and how easy is the interface”

- Respondent 13

The second category of factors is *compliance* and considers to what extent the suppliers prioritise and succeed in their sustainability work, that they comply with the client’s code of ethics, human rights compliance and code of conduct. If they do, a company is more likely to select that particular supplier.

“It is super important for us to work with suppliers that have the same (code of ethics and sustainability commitments as us)”

- Respondent 12

The third category of factors is the perceived *supplier durability*. Many respondents recognized that the rooftop solar market is growing rapidly and speculated that the growth might attract incompetent suppliers that are opportunistic to make profits. They also speculated that an overall consolidation of companies might occur in the industry, and wished that the supplier they ultimately hired to install a solar PV plant with a 30 year lifetime on their facility would not be acquired or merged in the future.

"It is not a company with a large investment firm in the background that only wants a company to grow. Our supplier is still partly state-owned and that makes it long term and they won't disappear from the market when the solar plant is complete. It is important for us to think that the supplier exists and takes care of the solar plant they have delivered. And we have seen that solar companies are being bought or changed names or disappeared. That makes it unsafe " - Respondent 5

The last category of factors is *supplier characteristics* which listed several preferred characteristics of suppliers. For example, respondents wanted both a partner that they could trust and was in it for the long run, but also a supplier that could be held accountable for the solar installation during its lifetime.

"Longterm seriosity is what you're aiming for. And probably, when something goes wrong one day, it will be easier to deal with if you have a long-term supplier you're working together with." - Respondent 4

5.2.4 Factors affecting onsite preparations, construction and maintenance

The factors affecting the onsite preparations, construction and maintenance was mainly the *product specifics* such as a monitoring system so that one could control the production of the solar PV plant.

This is exemplified through:

I can go in and see exactly what we have produced each hour or today or last year. It is a crucial factor when choosing a power plant, to have a simple but clear monitoring so that you get what you have been promised. That it generates both the reduced CO2 emissions and the economics that you have been promised" - Respondent 15

Apart from this factor, the study did not collect or analyse data that gave rich insights into this particular stage of the buying process.

6. Analysis and discussion

In the following section, we will discuss the empirical findings in light of relevant literature. The first part analyses the empirical findings in relation to our main research question on the OBP for rooftop solar PV. The second part will focus on our two sub-research questions on what factors affect the solar PV buying process and how these factors affect the process.

6.1 Organisational buying process for rooftop solar PV

As the literature suggests, organisations' buying process often follows a linear structure (Hutt & Speh, 2007; Johnston & Lewin, 1996), which was also the case for the buying process for rooftop solar PV. Hutt and Speh (2018) argue that the stages in the buying process may not progress sequentially and vary with the complexity of the purchasing situation. Nonetheless, the buying process in our study can be conceptualised into eleven codes which can be summarised in four aggregated steps. There are some similarities but also differences between the OBP for rooftop solar PV and the buying process that Hutt and Speh (2018) outlined.

The first stage in the OBP for rooftop solar PV is the *Decision to procure rooftop solar.* Some of the companies claim that the need has arisen because of a problem such as e.g. increased electricity prices. According to Hutt and Speh (2018), the OBP begins when a certain problem arises within the organisation that needs to be solved or through an opportunity that can be captured by acquiring a specific product. For rooftop solar PV, the problem does not arise within the organisation as increased electricity prices are an external influence that companies cannot directly control. Apart from the increased electricity prices, the capacity shortage also tended to create a feeling of scarcity which supported the company's decision to install rooftop solar PV as they wanted to make themselves less reliant on electricity from the grid.

Besides the need arising from a problem, the respondents in our study also claimed that the need was created by realising an opportunity with rooftop solar PV. The companies in our study mentioned four main opportunities: flat roofs, high electricity consumption, a desire to increase their proportion of renewable energy and lastly the quality of the renewable energy. Based on these four opportunities, they identified rooftop solar as particularly suitable. Differentiating between different qualities of renewable energy connects to RE-Source (2020) which addresses several different types of renewable energy procurement where a lot of the companies in our study strive for additionality as it has a higher sustainability value than non-additional renewable energy.

The next stage in the buying process for rooftop solar is *Selection of business model and scope.* This stage relates to the technical specifications of the desired product (Hutt & Speh, 2018). Regarding the choice of business model, some of the companies evaluated several business models whereas other just choose what they were most used to. Some based their choice of business model on the fact that it was more in line with their core business. Several companies claimed that the use of *third-party business models* was favourable as solar PV was not part of their core business. Liu, Yang, and Lin (2014) and Lin and Ho (2011) argue that innovation tends to be adopted more frequently and easily when the innovation matches the adopter's existing processes. Related to this, our study indicates that the companies choose a business model based on the compatibility of either *Ownership* or *TPO* with the company's core business. This may be because the technology is compatible with the company's current operational knowledge (Tornatzky & Klein, 1982). In this stage of the process, external help is often taken as the majority of the companies did not have the knowledge internally. Instead, they either contacted different suppliers or hired an external consultant to identify what sites that were suitable for rooftop solar PV. Thus, the supplier or consultant could then help the company to understand which business model is best suited to them and do the offer specifications. Noting that some companies decided on both scope and business model in tandem indicates that the buying process might not progress sequentially, which is in line with Hutt and Speh (2018).

Finding, evaluating and selecting a supplier is the next stage in the buying process for rooftop solar. Similar to (Hutt & Speh, 2018), this stage involves that the organisation searches for the best suppliers that can fulfil the needs of the organisation. Usually, when the product has a significant impact on the organisational performance, the organisation devotes more time and effort to evaluating different suppliers (Hutt & Speh, 2018). Our results indicate that not only does the significant impact on the organisational performance affect this stage. Due to the complexity of rooftop solar PV, this stage is of great importance as the client is to a large extent dependent on the supplier and its competence and capabilities. Therefore, the companies in the study make careful evaluations of different suppliers and take bids from different suppliers. However, the degree of evaluation still differs depending on the significant impact and the degree of maturity. Some of the companies in the study make very detailed and structured evaluations, have developed databases that list suppliers internally and aim to keep arm's length distance to supplies as they wish to negotiate. In contrast to this, other companies have less structured approaches and only do a desktop study or choose to collaborate with an existing supplier. That the companies will have different approaches to the buying process depending on their maturity is aligned with the research of Webster and Wind (1972), Nicosia and Wind (1977) and Doyle, Arch and Michelle (1979) who outline that the engagement with supplier and evaluation procedure differs depending the on if the customer buys something for the first time or if they are experienced purchasers. The empirical results of this master thesis indicate a difference primarily in the evaluation as new-task included demanding a partnership whilst modified rebuy included more of a transactional approach to suppliers.

The last stage in the OBP for rooftop solar is the *Onsite preparation, construction and maintenance.* In the preparation phase, both internal stakeholders and external suppliers are involved. This aligns with the research of Messeni Petruzzelli et al., (2011) who claim that collaboration between departments is required for green adoption and with Ramus (2000) and Fu et al., (2018) who argue that the wider support and collaboration between employees positively affects green adoption.

A simple monitoring system is demanded so that the buying organisation can follow up and control that the solar PV plant generates electricity, reduces CO2 and creates the financial return that they have been promised by the supplier. Factors affecting the monitoring system were primarily tied to coordination between internal stakeholders such as IT or construction departments. One can also argue that establishing a monitoring system decreases complexity as it makes the innovation relatively easier to understand and use (Rogers, 2003) as it translates the performance of the solar PV plant to a few understandable metrics such as electricity production and CO2 savings.

6.2 Factors affecting the Organisational buying process

6.2.1 Factors affecting the decision to procure rooftop solar

The empirical findings presented three *technological factors* that affected the decision to procure rooftop solar PV plans; *financials*, *branding* and *risks* associated with installing and having operational rooftop solar PV plants. Firstly, the notion that financial attractiveness increases adoption aligns with the work of Rogers (2003) who claims that relative advantage can be measured in economic terms. Nonetheless, relative advantage can include more dimensions of a product rather than solely its financial attractiveness such as reputation, satisfaction, performance and convenience. Similarly, according to Tornatzky and Klein (1982) who outline that adoption will increase when economic gains are higher, a similar pattern is discovered in the results of this master thesis as many respondents listed economic gains as a factor that supported the adoption. Moreover, the work by Etzion (2007) who outlined that the adoption of green practices can improve financial performance is also aligned with the results of this master thesis. However, Etzion (2007) claims that green adoption can result in an improved environmental performance which in turn can lead to improved finances over time. On the other hand, the respondents in this master thesis outline a more direct link between paying less for the solar energy produced than what they pay from the electricity grid. However, Ghisetti et al., (2017), Rahbauer et al., (2016) and Hwang, Huang and Wu (2016) have all pointed to the fact that economics might be a barrier to green adoption. We can still see signs that the *financials* are a barrier in the buying process of rooftop solar PV as respondents mention that conducting profitable solar projects is different from when projects are not profitable, primarily as profitable projects make the internal

departments collaborate better. Some respondents even mentioned that they do not proceed with solar projects that are not financially profitable. Even if the main reason behind the requirement for profitable rooftop solar PV projects is not explicitly mentioned by the respondents, a connection can be made to Sharma and Henriques (2005) who outline that shareholders expect a financial return on their investments, which all else equal, does not support unprofitable projects.

Secondly, *branding* is also listed as a factor that not only initially makes corporations consider installing rooftop solar but also ties the different departments together and makes them collaborate better. That green adoption is supported if the company sees the value that green adoption can have on its brand or marketing efforts is noted by both Rahbauer et al., (2016) and Qin et al., (2022). However, neither of these authors note that *branding* enables the departments in the adopting companies to collaborate better as is indicated by the empirical results of this master thesis. Further, Rusinko (2007) outlines that green adoption can provide companies with an edge over competitors as they develop a "green" reputation. This is somewhat related to the results of this master thesis as participants frequently mentioned the opportunity to show off their solar PV plants as a reason for the decision to procure rooftop solar PV. Assuming that a green reputation can also be considered an improved one, this also aligns with the research of Chen Y-S (2008) who claims that green adoption can lead to an improved company reputation. Related to this, customers can be key to imposing pressure on green adoption (Vachon, Halley & Beaulieu, 2009; Christmann, 2004; Guoyou et al., 2013; Hsu et al., 2013; Hwang, Huang & Wu, 2016). This line of thought is further supported by Hsu et al., (2013) and Wolf (2011) who outline that consumers increasingly demand suppliers to embrace green adoption. Nonetheless, it is not clear from the empirical findings from this master thesis whether there is a causal effect of customers imposing demand on suppliers who subsequently install rooftop solar PV or if companies realise that sustainability is a wanted attribute from customers and then proceed to install solar panels without being prompted by customers directly.

Lastly, a factor that overall negatively affects the decision to procure rooftop solar PV is the perceived *risks* with installing rooftop solar PV. Perceived risk is not explicitly mentioned in the theoretical framework. However, it is closely linked to the complexity of the technology as it is related to the degree to which an innovation is perceived as relatively difficult to understand and use (Liu, Yang, & Lin, 2014). Many of the companies mention that the perceived risks of installing solar panels negatively affects the solar PV buyer process which is in line with that complexity is negatively related to the adoption of the innovation (Rogers, 2003; Tornatzky & Klein, 1982). Chou, Chen and Wang (2013) and Völlink, Meertens & Midden (2002) mention that reducing the complexity of adopting green practices can positively influence a firms' adoption intentions. However, our study indicates that it is difficult to reduce the complexity or the *risks* associated with installing rooftop solar. Rather, one mitigates the risk of e.g. a roof collapsing due to the weight of solar panels by conducting a feasibility study.

The *organisational* factors that affected the decision to procure rooftop solar are that solar PV is considered as part of a *corporate identity*, that it contributes with *sustainability* and that the company has facilities with certain *site characteristics* that make them suitable for solar. All of these factors positively affected the decision to procure rooftop solar. The notion that rooftop solar PV aligns with the *corporate identity* included that many respondents believed that solar PV was something that was consistent with their values and the profile they wanted to show to varying stakeholders including clients and employees. This factor supported the decision to procure rooftop solar PV. The most relevant factor mentioned in the previous literature related to *corporate identity* is compatibility. Defined by Rogers (2003) as the degree to which an innovation is consistent and compatible with current values, past experience and the needs of potential adopters relates well to how respondents talked about how rooftop solar PV was aligned with their corporate identity. Additionally, some respondents also mentioned that just buying normal electricity from the grid is not good enough anymore, which aligns with the research of Guoyou et al., (2013) and Qin et al., (2022), who outline companies adopt practices that align with the obligations and values ingrained in the social context it acts within. This in turn aligns with the research of Jones (1999) who claims that companies that perceive a social obligation to contribute to society through expectations, codes of conduct or norms can stimulate green adoption.

Moreover, many respondents list the *sustainability* value that rooftop solar PV brings as a key factor that made them consider installing rooftop solar panels. They claim that solar PV is inherently tied to sustainability or that it was a component of fulfilling sustainability targets as one of the key reasons for engaging with solar PV. Similar to the technological factors of financial value of solar, *sustainability* positively affected the buyer process by enabling collaboration across departments. This mainly relates to relative advantage and compatibility, both outlined by Rogers (2003).

Relative advantage is relevant as it entails the extent to which an innovation is advantageous in relation to a previously used product or service (Rogers, 2003). This is the case for rooftop solar PV as it has a higher sustainability value in comparison to buying green certificates from the electricity grid. The fact that rooftop solar PV production has a higher sustainability value than procuring green electricity from the grid was also noted by respondents that claimed that the social acceptance for non-additional renewable procurement decreased. This in turn aligns with the research on stakeholder pressure (Buysse & Verbeke, 2003) who outline that pressure from selected stakeholder groups is a prominent factor that supports green adoption. This line of thought is also aligned with the research of Gonzalez-Benito (2006) who acknowledges stakeholder pressure but also comments that larger organisations are more likely to face such pressures. Additionally, Völlink, Meertens and Midden (2002) outline that green adoption is positively affected if the innovation is consistent with the firm's environmental objectives. This is certainly the case as many respondents outline sustainability targets as factors that positively influenced their decision to procure solar power. Interestingly, respondents mentioned the benefit of achieving sustainability and financial savings with one project as a factor that supported the adoption. A similar notion is listed by Zhu and Sarkis (2007) who observe that green adoption can be a part of a firm’s broader strategy of improving overall business performance. Assuming that business performance is measured by both financial and sustainability targets, our results are aligned with their findings. Assuming that the sustainability targets are set by management, our empirical findings also align with the research by Lin and Ho (2011) who outline that green adoption is supported by top management.

Lastly, many respondents *site characteristics* as a factor that made them consider rooftop solar. This included having facilities with large, flat and unshaded roofs with operations that had a high electricity consumption. There is no clear connection of this factor to any of the factors presented in the theoretical framework. The closest connection lies within claiming that the suitable sites are related to the organisation's overall infrastructure, which has been outlined by Ensminger et al., (2012) as a factor that supports green adoption. Additionally, Hwang, Huang and Wu (2016) point to organisational resources but refer to time and financial resources as factors that support green adoption. Lin and Ho (201) who also list organisational resources as a factor that supports green adoption stress factors such as size of labour force and sales. In sum, there are no clear connections to the factors presented in the previous literature and no author have pointed out that suitable buildings for rooftop solar PV improves the adoption of the technology, which is the case in the empirical results of this master thesis.

The main *environmental* factors that affected the decision to procure rooftop solar was the *government regulations* and the *environmental uncertainty*. *Government regulation* was primarily mentioned as a positive factor as it incentivises companies financially to invest in solar panels. However, it was also listed as a negative factor as some expressed uncertainty regarding whether the favourable policies for rooftop solar PV would sustain in the future. Our study indicates that regulations can both hinder and support the decision to procure rooftop solar PV. The supporting role of regulations primarily altered the *financials* of the solar PV plant through either tax incentives or investment aids which aligns with Scupola (2003) and Tornatzky and Fleischer (1990) who outline that government support can take the forms of financial incentives and especially Aragon-Correa and Sharma (2003) who name government subsidies and tax incentives in particular. However, none of the respondents mentioned that *government regulations* that decreased demand for non-green energy affected their decision to procure solar as outlined by Hwang, Huang and Wu (2016).

According to Lin and Ho (2011) *environmental uncertainty* relates to the frequent and unpredictable changes in customer preferences, technical advancement, and competitive behaviours. However, our study indicates that it is mainly the uncertainty of the availability and price of electricity in the future that creates uncertainty. Thus, our results indicate in line

with Lin and Ho (2011) that *environmental uncertainty* in terms of availability and the price of electricity will increase the likelihood of green adoption. Nonetheless, resilience against *environmental uncertainty* also relates to relative advantage as solar power can improve the quality of the production in terms of handling power outages (Deif, 2011). Related to this, one can argue that firms can increase their performance with solar power which is also categorised under relative advantage by Tornatzky and Klein (1982). However, our results also indicate that *environmental uncertainty* concerning the stability and durability of solar subsidies negatively affects the adoption of rooftop solar power. As this master's thesis does not investigate the net effect of these two factors, we can only conclude that *environmental uncertainty* can both support and hinder green adoption.

6.2.2 Factors affecting the selection of business model and scope

There were mainly two factors affecting the selection of business model and scope: I*nternal resources and capabilities* and *site characteristics*.

Firstly, the *internal resources and capabilities* including available resources, available staff to manage solar projects and knowledge and capabilities for the operations and maintenance proved to be important when considering what business model to choose.

In terms of deciding on what business model to use, there was a negative relationship between having available resources and choosing a TPO business model in which a third-party supplier would be responsible for the initial investment. This contrasts with the previous research that claims that organisational resources support green adoption (Ensminger et al., 2012; Hwang, Huang & Wu, 2016; Lin & Ho, 2011). Previous studies have indicated that an organisation's infrastructure (Ensminger et al., 2012), time and financial resources (Hwang, Huang & Wu, 2016) and size of the labour force and sales (Lin & Ho, 2011) all positively affect green adoption. The results of this study indicate that those factors primarily affect the choice of the business model for rooftop solar. In general, the more resources each respondent had, the more likely it was to conduct the solar projects with an ownership business model. On the other hand, if they lacked resources such as capital, time, or knowledge, they preferred TPO business models. This contrasts with previous research as it outlines that a lack of those resources would hinder green adoption altogether rather than

altering the choice of business model. One potential explanation for this difference is that the previous studies that highlight the positive effect that resources have on green adoption have focused on innovations in which the client does the initial investment which is not the case in TPO business models.

Secondly, having available staff to manage the solar projects and knowledge and capabilities for the operations and maintenance both negatively affect the use of TPO business models. This factor is heavily commented on by Lin and Ho (2011) who outline that competent employees support green adoption. In this master thesis, having employees that did not know a significant amount about rooftop solar PV did not hinder the overall adoption, but it did affect the choice of business model. This finding complements the research of Lin and Ho (2011) as it outlines that not having employees that know rooftop solar PV does not necessarily hinder adoption altogether but rather alters the choice of business model.

Two factors affected the overall scope of the rooftop solar project: *site characteristics*, consisting of the operations at the site, the electricity consumption at the site and the roof strength, and secondly *government regulation*. Firstly, many interviewees initially wanted to install solar on the less risky facilities that the company had. For example, this meant installing solar on less important warehouses before installing rooftop solar PV on more business-critical facilities such as production units. Additionally, high electricity consumption at the facility was believed to positively affect the business case of the rooftop solar PV plant. Moreover, the respondents mentioned that the strength of the roof affected the scope of the project as some of the roofs were not strong enough to support the weight of the solar PV panels. Even though not explicitly mentioned in the theoretical framework used in this master's thesis, we argue that all three of these factors can be categorised in relative advantage as they relate to the benefits or disadvantages of rooftop solar PV in contrast to the existing solution of buying electricity from the grid (Rogers, 2003). Lastly, *government regulation* was mentioned as a constraining factor when scoping the solar projects as there was a law that restricted solar PV plants to 255 kW in Sweden. The notion that *government regulation* can both support and hinder green adoption has already been covered in the previous subsection of this chapter.

6.2.3 Factors affecting finding, evaluating and selecting a supplier

There were primarily four categories of factors that affected finding, evaluating and selecting a supplier: *product specifics*, *compliance*, *supplier durability*, and *supplier characteristics*. The first category was the *product specifics* in which the companies primarily looked at the best available price to determine what supplier to choose. A second product-specific that also affected their choice of supplier was if it provided a good digital interface to monitor the production of the solar PV plant once it was operational. Both of these factors that relate to the technology fit under relative advantage (Rogers, 2003) as they consider advantages in relation to previously used technologies.

The second factor that affected this stage of the OBP was *compliance* which considered to what extent the suppliers prioritised and succeeded in their sustainability work, and that they complied with the client's code of ethics, human rights and code of conduct. If they did, a supplier was more likely to be selected. In relation to the previous literature, Rogers (2003) outlines that compatibility is the degree to which an innovation is seen to be compatible and consistent with current values, experience and the needs of potential adopters. The results of this master thesis rather mention compatibility as a factor that affects the choice of supplier which differs from the previous literature. Further, according to Liu, Yang, and Lin (2014), an innovation tends to be adopted more frequently and easily when the innovation matches the adopter’s existing processes. However, the results from this master thesis indicate that rooftop solar PV tends to be adopted more frequently and easily when the behaviour of the supplier matches the adopter’s existing values and norms.

The third factor that affected this stage of the OBP was the *supplier durability*. Many respondents recognized that the rooftop solar market is growing rapidly and speculated that the growth might attract opportunistic suppliers. They also speculated that an overall consolidation of companies might occur in the industry, and wished that the company they ultimately hired to install a solar PV plant with a 30 year lifetime on their facility would not be acquired or merged in the future. The respondents wanted a supplier that could be held accountable for the solar installation during its lifetime.

The previous research reviewed in this Master's thesis does not emphasise the characteristics of the supplier to a large extent. However, one could argue that one should consider the durability of the supplier as equal to the longevity of the product. In the empirical analysis, it is clear that many respondents want a supplier that will be around to service and help us with a solar PV plant that will have an operational lifetime of at least 30 years. If this assumption is made, one can argue that this factor fits under relative advantage as outlined by Rogers (2003).

The last category of factors that affected this stage were the *supplier characteristics*. Many respondents listed several criteria including, trust, professionalism, seriosity and knowledge as wanted characteristics. Just as the previous factor, these factors do not have a clear connection to the previous literature as they do not consider the environment, organisation or technology specifically, but rather the supplier that provides the product or service.

6.2.4 Onsite preparations, construction and maintenance

The factors that affected the onsite preparations, construction and maintenance were mainly the *product specifics* such as the monitoring system to be able to follow up on production figures and financial savings. There is no clear connection between this and the factors that support or hinder adoption covered in the theoretical framework of this master thesis. This master thesis did not collect or analyse data that gave rich insights into this particular stage of the OBP due to the sample of respondents interviewed who had rarely been part of this stage. Rather, the respondents were decision-makers in the stages from considering rooftop solar to signing a deal with a supplier within the OBP.

6.3 New proposed conceptual framework

As this master thesis set out to investigate how corporations in Northern Europe buy rooftop solar PV, what factors affect that process and how, the new proposed theoretical framework can help us to answer those questions. With regards to the empirical findings and the subsequent analysis, we identify that OBP of rooftop solar PV consists of four main steps and include *(1) Decision to procure rooftop solar, (2) Selection of business model and scope, (3) Finding, evaluating and selecting a supplier and (3) Onsite preparations, construction and maintenance.* Within this process, there are several factors that influence the decision to procure rooftop solar. The codes regarding the factors can be categorised into four themes *(1) Technology, (2) Organisation, (3) Environment* and *(4) Supplier.* Within each theme, several factors can be found that influence the process at different stages. Our new framework below highlights all the factors that influence the buying process for rooftop solar. However, as described under *4.3.3 Significance and frequency of factors*, the different factors have various levels of significance depending as outlined by the colours in Table 6. The frequency and significance of each factor are determined by the shade of blue included in the framework. A darker shade of blue indicates a higher frequency and significance in affecting the OBP and a lighter shade of blue indicates a lower frequency and significance.

In the *decision to procure rooftop solar*, *technological* factors such as *financials* and *branding* supported adoption whilst risks hindered it. Additionally, *organisational* factors such as *corporate identity* and *sustainability* supported the adoption. Finally, *environmental* factors such as *government regulation* and *environmental uncertainty* both supported and hindered adoption depending on context. In the *selection of business model and scope*, factors such as *internal resources and capabilities* affected the choice of business model. Neither of these factors hindered or supported adoption but rather affected the way in which the companies realised their rooftop solar projects. The net effect *site characteristics* had on the overall adoption is unanswered as *site characteristics* both supported adoption if the respondents had e.g. large roofs and high electricity consumption, and hindered it if the facilities had e.g. limited roof strength. *Government regulation* also limited the size of some solar PV plants as there were laws restricting their size in some contexts.

In *finding, evaluating and selecting a supplier*, factors such as *compliance*, *product specifics*, *supplier characteristics* and the *supplier durability* affected the decision. Being aligned with a client's compliance, having a low price and a suitable digital interface to monitor the solar production, and being perceived as long-term, trustworthy and knowledgeable all increased the chances of being selected as a supplier and thus supported the adoption of rooftop solar PV. In the *onsite preparations, construction and maintenance*, factors such as *product specifics* including a monitoring system positively affected the adoption of rooftop solar PV.

Table 6 - New proposed conceptual framework

Theme	Code	Decision to procure rooftop solar	Selection of business model and scope	Finding, evaluating and selecting a supplier	Onsite preparations, construction and maintenance
Technological	Additionality				
	Complexity				
	Financials				
	Branding				
	Product specifics				
	Resilience				
	Risks				
Organisational	Company characteristic				
	Compliance				
	Corporate Identity				
	Internal consistency				
	Internal pressure				
	Sustainability				
	Internal resources and capabilities				
	Site characteristic				
Environmental	Environmental uncertainty				
	Government regulation				
	Stakeholder pressure				
Supplier	Supplier durability				
	Supplier characteristics				

7. Contributions and future research

This section of the report outlines the theoretical and subsequently the practical contributions of this master thesis. The section finishes by outlining the limitations of the master thesis and consequently provides suggestions for future research.

7.1 Theoretical contribution

By answering the research questions in this master thesis, its main theoretical contribution is that it develops a new framework that aids the understanding of how corporations buy rooftop solar PV in three dimensions.

Firstly, this master thesis develops a new OBP in the context of rooftop solar PV for companies in Northern Europe. The conceptualised process contributes to an understanding of the steps in the OBP for rooftop solar PV. Secondly, the new proposed theoretical framework introduces a new theme of factors that affects adoption: the *supplier*. This complements the previous three categories of factors: technology, organisation and environment. This addition highlights that in the context of the buying process of rooftop solar PV, factors that relate to the supplier should not go unnoticed when considering the factors that affect the adoption. Lastly, the new proposed theoretical framework adds to previous research by explaining how the factors affect adoption from the perspective of an OBP. The previous research in green adoption covered in this master thesis is primarily quantitative and outlines what factors affect adoption in general. With the new proposed theoretical framework, this master thesis has been able to outline not only if a factor affects adoption but also how these factors affect adoption in relation to the OBP for rooftop solar PV. This adds to the understanding of how the factors that affect adoption by outlining where in the buying process they either support or hinder it.

7.2 Practical implication

The practical implications of this master thesis are threefold as it informs three separate stakeholders with a conceptualization of the OBP for rooftop solar PV, what factors affect it and how they affect it. This improved understanding can thus aid in increasing the adoption of rooftop solar PV by highlighting the context of how it is bought and what factors both hinder and support its adoption.

Firstly, this master thesis informs suppliers with regards to what factors affect the OBP and how, enabling a more effective and efficient design of their offerings to accelerate rooftop solar adoption. For example, suppliers should focus on providing low prices, take the risks of installing rooftop solar into consideration and be aligned with their client's compliance.

Secondly, this master thesis informs potential clients of rooftop solar PV and informs how they could buy it by outlining how other corporations have procured the technology. However, this master's thesis does not map an OBP that is claimed to be the most efficient way of procuring rooftop solar PV. Yet, outlining the OBP can still act as an inspiration for potential clients that wish to procure rooftop solar PV.

Thirdly, this master thesis informs policy makers as it outlines that corporate buyers of rooftop solar PV believe that *government regulation* both hinder and support adoption depending on how the regulation is formed and how it is anticipated to change in the future. Therefore, governments should consider forming policies that do not restrict the size of rooftop solar PV plants and be clear on the future developments of policies if their main objective is to stimulate the growth of rooftop solar PV.

7.3 Limitations and Future research

There are three main limitations of this master thesis that in turn can be considered in future research. All three shortcomings relate to the sample included in the study.

Firstly, the sample included in this master thesis does not control for the previous purchasing experience of the companies included in the study which could have affected the results as some of the companies were more experienced in procuring rooftop solar PV than others. As outlined previously, the buying process will differ depending on if the company has previous experience in procuring a good (Hill & Hillier, 1977; Robinson, Faris & Wind, 1967; Webster & Wind, 1972). This notion is also aligned with some of the respondents in this study who highlight that e.g. their evaluation of suppliers changed depending on if they procured rooftop solar PV for the first time or if they were experienced buyers. One suggestion for future research is to replicate the study in this master thesis but to control for this difference in the sample. For example, this can be done by only including participants that procure rooftop solar PV for the first time.

Secondly, as noted previously, this master thesis primarily identified factors that affected the first stage of the buying process for rooftop solar PV. It remains unanswered if this notion is a consequence of a skewed sample consisting primarily of stakeholders that were involved at the beginning of rooftop solar PV projects, or if the factors that do affect adoption primarily influence the decision to procure rooftop solar. Regardless, we believe that future studies should consider including a more varied sample including stakeholders that were involved throughout all the stages of the rooftop solar PV project. This could include stakeholders involved in the legal or financial aspects or personnel responsible for the sites at which the rooftop solar PV plants are installed.

Thirdly, even though the study did not aim to generate statistical generalisability, we do acknowledge that the study uses a relatively small sample in a specific setting at one specific point in time. Nonetheless, the study aims for theoretical generalizability which future research will have to determine in new e.g. geographical contexts.

8. Concluding remarks

The purpose of this master thesis was to understand how corporations in Northern Europe buy rooftop solar power. This was answered by outlining the steps in the rooftop solar PV buying process, by identifying what factors affected it and how those factors affected the process. The results indicate that the rooftop solar PV buying process consists of four steps: (1) *Decision to procure rooftop solar*, (2) *Selection of business model and scope*, (3) *Finding, evaluating and selecting a supplier* and finally (4) *Onsite preparations, construction and maintenance.* In the *decision to procure rooftop solar*, technological factors such as *financials* and *branding* supported adoption whilst *risks* hindered it. Additionally, organisational factors such as *corporate identity* and *sustainability* supported it. Furthermore, environmental factors such as *government regulation* and *environmental uncertainty* both supported and hindered adoption depending on the context. In the *selection of business model and scope*, factors such as *internal resources and capabilities* affected the choice of business model and both *site characteristics* and *government regulation* affected the scope of the rooftop solar projects. In *finding, evaluating and selecting a supplier*, factors such as *compliance*, *product specifics*, *supplier characteristics* and *supplier durability* affected the decision. In the *onsite preparations, construction and maintenance*, factors such as *product specifics* affected the stage in the buying process. In terms of how these factors affected the buying process, many of them were context-dependent and could either support or hinder the buying process depending on the situation. To conclude, there are a variety of factors that affect the four outlined steps in the rooftop solar PV buying process. Acknowledging these factors and how they affect the buying process is relevant for suppliers of rooftop solar PV systems who can tailor their offerings to how their potential clients buy rooftop solar PV, policymakers who can support or hinder the adoption of rooftop solar PV through the design of policies and lastly, potential solar PV clients who can use the outlined buying process as a tool for procuring rooftop solar PV themselves. Even though this master thesis relies on a relatively small sample, it sheds light and contributes theoretically by conceptualising a new theoretical framework that combines two dimensions: a buying process for rooftop solar PV and the factors that affect it. This framework can be further developed in future studies by either abductive or deductive research and by placing further delimitations on the sample used.

9. Appendix

9.1 Appendix 1: Interview guide

Intro

- Introduction to the master thesis
- All answers will be confidential
- The thesis will later be published on the Stockholm School of Economics website
- We will handle the data according to best practice according to EU's GDPR
- Fine if we record to do the transcription?
    - Do you want to receive the transcription to make edits if you think something was formulated incorrectly?

Theme 1: Introduction

1.1 Can you tell us about your role in the company you're working at?

1.2 What is your role and what are your responsibilities?

Prompt: when did you join, in which role, development etc.

Theme 2: Renewable energy

2.1 Can you describe how your company works with renewable energy?

Prompt: when started, how started it etc.

Theme 3: Rooftop solar power

3.1 How many solar projects has your company done?

3.2 What were the main factors that made the company start to consider installing rooftop solar panels?

Promt: What benefits were expected? What was the trigger? Internally or externally driven?

Theme 4: Buying process

4.1 If you would re-tell the story of how you bought the latest rooftop solar project from start to end, how would you tell it?

4.2 If you would define the steps in that buying process, what would those be?

4.3 Who else, both individuals and groups, were involved in each phase of the buying process?

4.3.1 In what sequence was each stakeholder group involved?

4.3.2 How/when was senior management involved?

Prompt: External or internal people/groups/communities

Theme 5: End

6.1 Now that you have outlined this rooftop solar project at your organisation, what were your major learnings?

6.2 What is holding you back to do more rooftop solar projects?

6.3 Looking back, what was particularly difficult?

6.4 Is there anything you think we have missed or that you would like to add?

6.5 Do you have any questions for us?

6.6 Are you available for follow-up questions via email in case we have missed something?

6.7 We are interested in gaining a holistic view of the solar buying process and would love to have the opportunity to interview more people at company x. Would you mind referring us to anyone internally?

9.2 Appendix 2: Supportive quotes from the interviews

Quotes	**Organisational Buying Process**
"I say primarily avoiding electricity costs, because that's where the main business case is, that's the way the main return of investment and yeah, like I say, business case plays, there's a big push on, particularly from our sort of corporate social responsibility department on more credible ways of procuring or generating our own energy." *...* *"Yeah, but avoiding electricity costs is the first step because that's the business case you put to the board. But the credibility, as well as our sort of sustainability credentials, is also the next push, right?"* - Respondent 2	Decision to procure rooftop solar
"And we recognize that and we have a strategy which we've got a reference in our sustainability report that we want to move to more additional sources of renewables to actually. We see the two ways of doing that on site solar PV and offsite power purchase agreements. Both these things lead to new renewables. Obviously onsite is on site, but it's got scale limitations. Offsite is less tangible, but it is got the ability to have scale." - Respondent 16	Decision to procure rooftop solar
"It starts with monitoring the electricity price and noticing that it rises. So we wanted to consider options. And what can we do to get some kind of control over the price given then the grid owner has a monopoly? And they can do whatever they want, so what can we do to have some control over our electricity price?" - Respondent 14	Decision to procure rooftop solar
"Based on the electricity prices that were then, then we thought that they will not be lower, they will only be higher." - Respondent 6	Decision to procure rooftop solar
"But also that it is entirely linked to the financials. But precisely that the price of electricity increases and that you shut down nuclear power and so on, the price of electricity and the market become more volatile. So we believe that the price of electricity will continue to increase and it has done so. Since 2020, it can be said that there is a lot to be gained from producing some of it on your own. So it does. It is also a security factor to hedge in locking in parts of its electricity price in the very long term." - Respondent 14	Decision to procure rooftop solar
"The first solar PV plant was just me who thought it was fun and just said that we should make this so that it is now interesting for all departments and that is why." - Respondent 10	Decision to procure rooftop solar
"After that, look at orientation of roof, shading aspects, etc" - Respondent 2	Selection of business model and scope
"Look through properties based on age, geographical location and then sent that to a supplier" - Respondent 2	Selection of business model and scope
"Essentially, no, we are not considering alternatives. The decision was taken because we usually have quite strict investment criteria. We usually go for a three year payback time on investing our capital very slightly. But let's say three years and we kind of get those kind of returns with PV or generation. So it made sense to do it as a third party funded solution. Plus, there are also other benefits, obviously, of offsetting the performance risk and outsourcing." - Respondent 3	Selection of business model and scope
"That model works perfectly for us to go in because then there is another expert in electricity who can take the whole idea and be responsible for the function. . After all, we are a real estate company and not an energy company. This is also what we promise the stock market with IFRS rules and everything. We make money from rents, not from selling electricity. The electricity companies can do that. That is why we have structured PPA agreements "- Respondent 10	Selection of business model and scope
"You know, it's looking at what's best for the planet and can we actually have a bigger impact than just buying certificates?" - Respondent 16	Decision to procure rooftop solar
"*Then it was really just that in the next step, well then we have to buy solar cells and then we grope a little in a certain darkness, you always do. It was a lot to find a supplier, a partner, to*	Finding, evaluating & selecting a supplier

find someone you think you can trust, who helps you and leads you right in what you can not." - Respondent 4	
"So not just leave it up to the construction department, but our IT department as well. So there's a lot of network and data connections also associated with solar array. So in order for maintenance to be firmly carried out, there needs to be a net connection and data coming from the solar panels so that they can monitor the health of the inverters at any given point" - Respondent 2	Onsite preparation, construction and maintenance

Quotes	**Theme**
"There is money to make in doing good environmental work" - Respondent 4	Technological
"And then of course, we have the marketing piece. I mean, of course, our customers are very interested in what we are doing to help them to produce better products so less carbon footprint and more sustainable into the long run" - Respondent 7	Technological
"We are one of the companies within E-commerce that have put the most effort into our green profile" - Respondent 16	Organisational
"We want to be very sustainable in what we do" - Respondent 15	Organisational
"So we always reinforce our roofs in case we need solar panels. Because you need some, some better the better. The top layer of the roof needs to be a bit stronger. And you need to calculate this also with the steel constructions regarding to the weight and so on" - Respondent 13	Organisational
"We contacted three different suppliers who were all very interested in doing the job, then it boiled down to two and then it was the traditional that it should be a partner that remains after 10 years, 20 years and then it felt the supplier a little more stable." - Respondent 6	Supplier

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