

# The management and control of risks in organizational relationships

*The design of a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets*

Master thesis project  
Eva Ferrier  
Delft, March 2013





## Project details

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Title: The management and control of risks in organizational relationships  
Subtitle: The design of a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets

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## Preface and acknowledgements

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This research report is conducted in guidance of Vattenfall at the “Market strategy and Business development” business unit. It serves as the graduation thesis report of the Master: System Engineering, Policy Analysis and Management (SEPAM) at Delft University of Technology (TU Delft).

This research journey has been an amazing journey which I enjoyed very much and will never forget. The joy I experienced I owe to:

My graduation committee a greatly thank for the time they devoted to my research and the guidance and feedback they have given me during my graduation research.

My supervisors at TU Delft: John Groenwegen, Aad Correljé and Martijn Groenleer for their support which motivated me to explore the scientific world and to dive deeper into the material.

Diederik Apotheker, I would specially like to thank him for giving me the opportunity to perform my research at Vattenfall, Amsterdam. If it had not been for Diederik, the colleagues I interviewed and those who participated in the workshop I would never have gained so much practical knowledge and for that reason I am grateful to them for sharing their time as well as their knowledge. I also would like to thank my colleagues of the E-mobility and Gas Competence for welcoming me with open arms and making my stay at Vattenfall unforgettable.

My family for always supporting me and giving me valuable advice from the moment I set foot on earth. My friends, for just being there whenever I needed them, for having unforgettable moments of fun and recharging me now and again during my studies and research.

And last but not least, I would like to thank Albert Einstein for inspiring me to tackle the complexity and strive for simplicity. The road to simplicity has not been without hurdles and with Albert Einstein’s statement I was able to convince myself to continue with this road till the final result was designed.

Eva Ferrier  
Delft, March 2013

*Any intelligent fool can make things bigger and more complex. It takes a touch of genius and a lot of courage to move in the opposite direction.*

- Albert Einstein-

## Executive summary

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The liberalization of the energy sector has transformed the energy market into a dynamic and competitive environment. Energy companies are constantly striving to create competitive advantages in order to maintain or strengthen their market position. The energy company, that is central in this research, is aiming to expand its business through customer interfacing businesses in energy-related markets. With this strategy the energy company position itself as a “*smart energy enabler*”. A stronger customer relationship can be build and retained with the product portfolio expansion. With these new business opportunities the energy company wants to cope with changes in the energy market that threaten the traditional revenue streams of energy companies, which formerly only derived revenues from sources such as gas, electricity, and heat.

As the energy-related market is not the core focus of energy companies, energy companies do not have all the necessary activities and resources in-house to commercialize energy-related products and services successfully on their own. Through effective organizational relationships with other companies in the energy-related sector, access to these activities and resources can be gained and exploited.

There is no guaranteed success for entering into organizational relationships. It is therefore vital for strategic purposes to control and manage organizational relationships through appropriated organizational governance structures. In this research, an organizational governance structure is defined as the structure through which the risks that accompany organizational relationships are managed and controlled. Appropriate organizational governance structures are designed along decision-making processes that are complex.

The focus of this research is to design a framework for the support of decision-making process concerning organizational governance structures. The main research question is formulated as follows:

*Which aspects should be considered in a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets?*

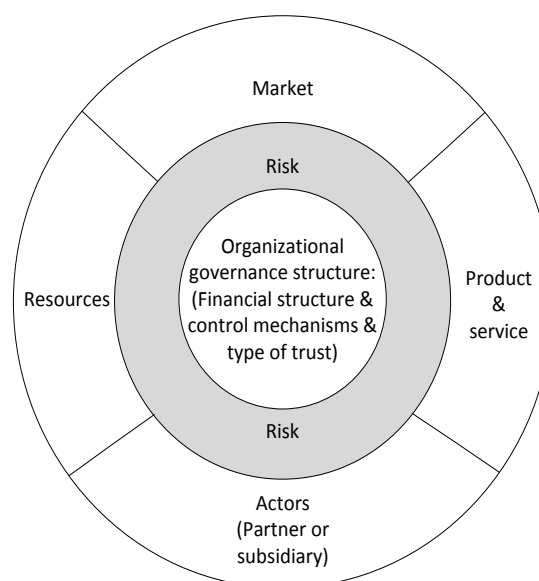
The outcome of this research is a prescriptive framework for organizational governance structures, which is designed by using:

- A desk research concerning the research fields organizational management and decision-making processes in multi-actor setting. (To be precise, Transaction cost economics (TCE), Resource based view (RBV) with the extension of Resource dependency theory (RDT), and theoretical discussions regarding risks, control, and trust contribute to the theoretical constructs that are considered in this research.)
- An in-depth case study analysis of two organizational relationships between an energy company and energy-related company.
- A workshop and a couple of surveys with several experts

Prior to the design, it is important to frame the complexity that is present in decision-making processes concerning organizational governance structures. These decision-making processes concerning are not straight forward, but rather complex due to the following reasoning:

- Different elements underpin organizational governance structures and a wide range of combinations between these elements are possible.
- There are many aspects that need to be taken into consideration during the decision-making process. In this research, various factor characteristics are identified. The factors are categorized in four categories; market, product, actors, and resources. Besides the factor characteristics, trust, corporate strategy, and the bandwagon effect influence the decision-making process
- The decision-making process takes place in multi-actor setting. Actors are the organizations as well as the departments of the organizations. These actors need to make joint decisions concerning the organizational governance structure which is not straight forward. Each organization and also each individual department has its own objectives and interests, and therefore the objectives are not always simple to align, which makes the decision making process complex.
- The design of organizational governance structures is an iterative and evolving process which is formed during the organizational relationship life cycle. They are designed over time because they should be adjusted or even be redesigned over time in order to cope with the upcoming changes in context. Based on this, it can be concluded that these decision-making processes are rather dynamic than static.
- Decision arenas are important in the decision-making process. An decision arena is a virtual place where the involved actors meet, interact, and make joint decisions. Decision arenas take place ex ante and ex post for the design organizational governance structures. Moreover, the topics of the decision arenas differ, there is no chronological order in the decision arenas, and the decision arenas influence each other.

Based on the complexity and the identified aspects that need to be considered, the decision framework consists of three layers, which are illustrated in Figure 1.



**Figure 1 Decision framework**

The outer layer contains the four categories in which the factors and their characteristics are categorized. The middle layer contains the risks that organizational relationships encounter, and the inner layer contains organizational governance structures. Organizational governance structures consist of a combination between a financial structure, different control mechanisms, and a type of trust.

This decision framework is supported by a risk matrix. The risk matrix is based on various theoretical discussions, such as TCE, control, risk and trust. As shown in Figure 2, the risk matrix consists of two risk axes: output risk and process risk. Based on the level of output - and process risks, a financial structure, different control mechanisms, and a type of trust are recommended.

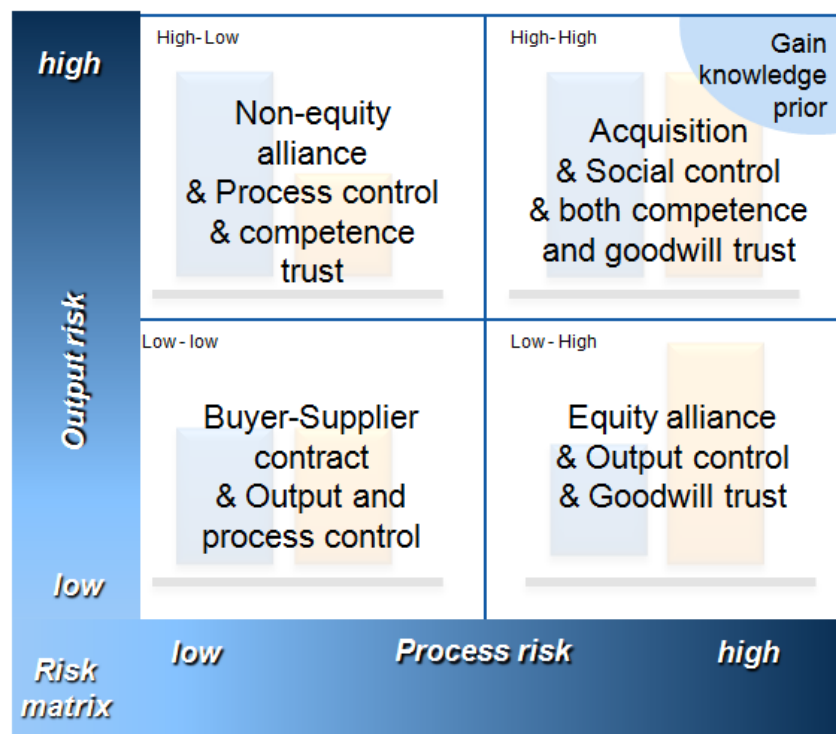


Figure 2 Risk matrix

The framework and the risk matrix together provide a guide for decision-makers to design organizational governance structures by following three distinctive steps, which are:

1. identify factor characteristics of the four categories: market, products and services, actors and resources.
2. identify risks and categorize the risks in output and process risks.
3. design organizational governance structure by choosing a financial structure, control mechanisms, and type of trust.

The decision framework provides guidance by illustrating the aspects that need to be considered, the relation among these aspects, and the steps decision-makers should take. This research identified several characteristics with respect to the four factors based on the theoretical constructs of TCE and RBV.



When the framework is used, decision-makers should notice the following limitations:

- The framework does not consider the fact that there can be several organizational governance structures that can be implemented for a certain risk context in which the organizational relationship is embedded. Decision-makers should use the framework to gain understanding of the aspects that require attention and which financial structure, different control mechanisms and type of trust potentially can be implemented. If decision-makers want to deviate from the organizational governance structure given in the matrix, it is necessary to analyze whether the deviation is acceptable by analyzing if the risks are mitigated appropriately or if the deviation can be made possible with the implementation of certain measures such as process standardization.
- Furthermore, the decision framework does not consider the formulation and reasoning of the strategic value proposition, the customer segment and finances. These elements, which are included in a business model, are also essential to get a complete overview of business expansion possibilities.

Despite the limitations, the decision framework is a useful tool for the support of decision-making processes concerning organizational governance structures. It is flexible in its usage. It can support ex ante as well as ex post decision arenas. Depending on the purpose, decision makers can either use the framework for forward or backward engineering. Forward engineering means creating a new organizational governance structure. This should be done after defining the strategic value proposition in order to narrow down the scope of analysis. Backward engineering means the evaluation of organizational governance structures; to monitor whether the organizational governance structure is still capable of coping with the risks that are encountered by the organizational relationship. Performance indicators are needed to control the organizational relationships. Alarming performance indicators must trigger the evaluation of the organizational governance structure. And when necessary, adjustments or even redesign efforts must be executed to cope with the new identified risk context.

In addition to the design of the decision framework and risk matrix, other key remarks regarding the management and control of organizational relationships are as follows:

- Even though a throughout statistical analysis has not been conducted in this research, the factor characteristic 'product maturity' has shown an apparent relation with the choice for a particular financial structure. The more mature the product is, the less hierarchical the financial structure.
- Organizational relationships are accompanied with resource dependency. Within organizational relationships that are analyzed in depth, the energy company is mostly depended on the technical resources of the partner. The partner, on the other hand, is dependent on the commercial resources of the energy company. In some cases, they are mutually dependent but the dependency can also be disproportionate. The dependency of the energy company is greater compared to the partner, especially when the technical resources of the partner are strategic.
- This resource dependency can lead to a lock-in effect, which can be intensified by the organizational governance structure. The path dependency, which is also created, can even intensify the lock-in effect further. To prevent from getting locked in an organizational

relationship, it is vital that decision-makers design the primary organizational governance structure in such a way that exit options, without great financial losses or other hurdles, are created.

- Adjustments or redesign efforts are not always simple to implement due to the presence of path dependency. It is impossible to neglect previous organizational governance structures and start from a blank sheet. In particular where the systems are heavily integrated.
- The organizational governance structures implemented in practice are not always in accordance to the preferred organizational governance structure given in the risk matrix. Deviation is possible due to the limitation of the risks matrix to illustrate that various organizational governance structure can be implemented for a certain organizational relationship. However, the deviation can also be explained due to corporate strategies and the bandwagon effect.

Summarized, the final result of this research is a decision framework that together with a risk matrix offer guidance for the design of organizational governance structures. Besides this practical relevance, this research also has a scientific relevance.

This research analyses and combines the research fields regarding organizational management and decision-making processes in multi-actor setting into a new framework. To be more precise, TCE and RBV are integrated and precisely operationalized for the specific research context. TCE and RBV together provide valuable insights in the management and control of organizational relationships, however they lack to take social aspects and process elements into consideration. The decision framework adds the social factor trust and process elements from the decision-making process to insights gained from TCE and RBV. In other words, the framework provides insights in the decision-making process from an internal versus external, as well as, economic versus social perspective. In addition, insights regarding the dynamic in these decisions are provided.

In the end, it must be acknowledged that the complexity in the two research fields is analyzed and integrated into a decision framework that grasps this complexity in a simplified matter.



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## 1. Introduction

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*This chapter provides an introduction and background information regarding the research problem. In paragraph 1.1 the energy market and the recent developments in the energy market are described. The problem owner Vattenfall and the business strategy Vattenfall has formulated to face the challenges in the energy market are elaborated in paragraph 1.2 and 1.3 The practical and scientific research problem is formulated in paragraph 1.4 Paragraph 1.5 to 1.11 the research objective, research scope, research relevance, research phases and research questions, research approach, research methodologies and methods, and data collection methods are discussed.*

### 1.1. Energy market

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The energy market has changed markedly over the last 20 years. In the late 1990s, the first electricity and gas directive was adopted by the European Union (hereafter: EU). With the adoption of the first electricity and gas directive, competition is gradually introduced in the energy market (EurActive, 2009). Prior to liberalization, the energy market was vertically integrated (WorldEnergyCouncil, 2010), but to foster effective competition the market got restructured by unbundling the vertically integrated activities such as generation, transmission, distribution, and retailing. The transmission and distribution activities got separated from the generation and retail activities because of the former natural monopoly characteristics. This separation was crucial to prevent anti-competitive behavior by incumbent generators and ensure equal access to the electricity networks for other energy companies (Jamasp, 2005).

The structure of the energy market has changed due to the liberalization. This change affects all actors. Energy companies face many new challenges which were not present before the liberalization. Most energy companies are no longer government owned organizations but private organizations situated in a competitive and highly dynamic market. The competitive pressure will increase further since the EU stimulates the competition and strives to create fair market competition in the European energy market (WorldEnergyCouncil, 2010). Dynamics in the energy market will probably also increase because of the challenges it faces, such as climate change and fossil fuel depletion. These challenges drive technological innovations that force the energy market to change and adapt.

Due to the competition in the energy market, it is crucial for energy companies to secure their market position through competitive advantages. The dynamics in the energy market challenge the energy companies to do so.

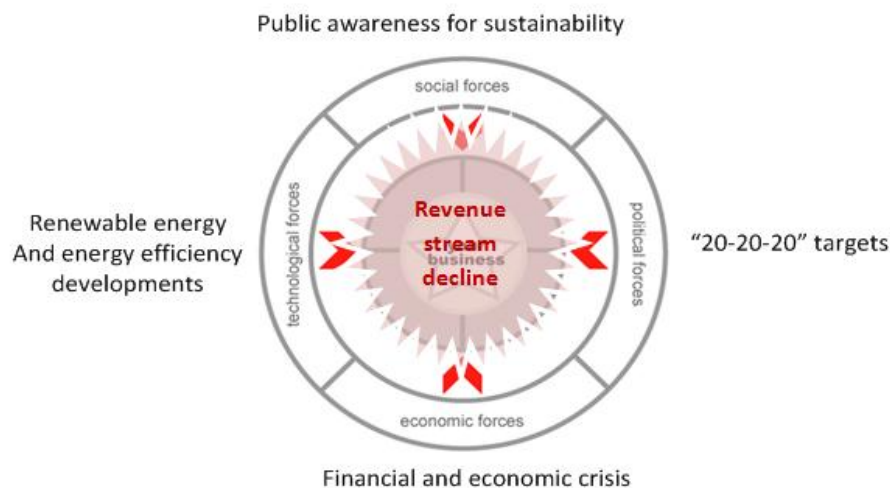
### 1.2. Vattenfall

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Vattenfall is a Swedish government owned energy company with Sweden, Germany and the Netherlands as its core markets. It is also active in Poland, Finland, Denmark, Norway, Belgium, UK and France (Vattenfall, 2011). Vattenfall is a Swedish government owned company, but it operates as a private company in the dynamic and competitive energy market

Vattenfall is one of the leading energy companies in Europe. It has a strong market position in its core markets and Vattenfall is the sixth largest electricity producer in Europe. In Sweden Vattenfall is the largest electricity producer with a market share of 50%. In Germany and the Netherlands Vattenfall is the third largest producer of electricity (Vattenfall, 2011). The core products of Vattenfall are electricity, gas, and heat and besides these commodities Vattenfall also provides various energy efficient products and services.

To secure its market position and competitive advantage, Vattenfall needs to adapt its strategy over time. Adapting strategies is not an easy task and in the past various organizations have failed to do successfully. Some market-leaders have faltered and allowed new entrants to prosper (Grant, 2010). In adapting strategies, it is necessary to identify macro-environmental forces that challenge the organizations' businesses. With a brief PEST-analysis, the macro-environmental forces that effect Vattenfall's business are identified, see Figure 3.



**Figure 3 Impact of macro-environmental forces**

#### *Political forces*

The "20-20-20" targets formulated by the EU threaten the energy demand as well as the demand for fossil fuel energy, such as coal and gas, over time. The "20-20-20" targets which member states should accomplish by 2020 (EuropeanCommission, 2010) are:

- A reduction of greenhouse gases with 20% compared to 1990
- An increase in renewable resources to 20% of EU energy consumption
- An improvement of energy efficiency in order to reduce primary energy use with 20%.

To meet these targets, the energy demand as well as fossil fuel energy demand, such as coal and gas, must decline over time.

#### *Technological forces*

The EU targets along with national policy mechanisms in EU member states foster market penetration of both sustainable energy technologies and energy efficiency technologies. Lewis and Wiser (2007) studied the impact of direct and indirect policy mechanisms on the development of the wind energy market. They concluded that the direct and indirect policy mechanisms have a positive impact on wind energy developments. These policies stimulate the development of other renewable

energy and energy efficiency markets. These developments have a negative impact on the fossil fuel demand as well as the total energy demand. This negative impact will cause a decline in the revenue streams of the core products of Vattenfall in the end.

#### *Social forces*

The EU also stimulates public awareness regarding sustainability (EuropeanCommission, 2006). The awareness of sustainability has found its foundation in different layers of society. Customers are more aware and statistics have shown that more residents within the Netherlands are willing to invest in solar energy. The investment costs of solar panels decreased and due to this decrease it is possible to finance solar energy without subsidies (CBS, 2010). As more customers invest in solar panels or other sustainable energy technologies, the demand for energy volume from energy companies decreases. Again, this decrease threatens the revenue streams of Vattenfall's core-products.

#### *Financial forces*

The financial and economic crisis had a marked impact on the energy markets. Due to the economic crisis both energy demand and energy prices decreased (EuropeanCommission, 2010). A new recession can be expected as the commission Vice-President for Economic and Monetary Affairs Olli Rehn states: "*Growth has stalled in Europe, and there is a risk of a new recession*". A new recession can lead to a stagnation of Gross Domestic Product (hereafter: GDP) (EuropeanCommission, 2010). As the GDP and energy consumption are correlated (Eurostat, 2011), it is expected that a decrease in the GDP will lead to a decrease in energy consumption and thus a decline in the revenue streams of Vattenfall's core products.

To conclude, Vattenfall's revenue streams formerly derived from of its core products is threatened by political, financial, social, and technological forces. It needs to adapt its strategy to cope with this threat and safeguard its market position.

### 1.3. Business strategy

Vattenfall expands its business with downstream customer interfacing businesses in energy-related markets to position itself as a '*smart energy enabler*'. With this position Vattenfall strives to cope with the threat described above. Downstream customer interfacing businesses are businesses that focus on the customer and provide energy-related products and/or services. These energy-related products and services are beyond-the-meter. They use energy or generate energy or influence the energy consumption of consumers. A solar panel is an example of an energy-related product. With the '*smart energy enabler*' strategy, the product portfolio is broadened. A better customer relationship and new revenue streams are created and retained with this broader product portfolio.

In addition, the political environmental force forces Vattenfall to concentrate on downstream customer interfacing business. Recently the EU has announced the Energy Efficiency Directive (EED). The objective of the EED is to fill the gap between the current energy efficiency percentage and the efficiency target stated within the "20-20-20" targets. With the current measures in place, the 20% efficiency target will not be reached by 2020. With the measures that are in place only 9% savings will be accomplished. The EU holds, therefore the energy distributors and energy retail companies

responsible to meet the 20%. The energy distributors and energy retail companies are required by the EU “to save 1,5 % of their annual energy sales volume, through the implementation of energy efficiency measures such as improving the efficiency of the heating system, installing double glazed windows or insulating roofs, among final energy customers.” (EurActive, 2012).

Thus, downstream expansion is not only desirable to broaden Vattenfall’s product portfolio and create new revenue streams, but it also helps Vattenfall to cope with EU obligations. The creation of functional values, such as electricity, gas or heat, is no longer the only customer value focus that is attractive for Vattenfall. For Vattenfall, it is also attractive to focus on the creation of energy related products and services that provide other values to customers, such as a solution value or experience value. Solution value products and services provide a solution to the end-customers. This solution can be provided by the product or service or by the integration of different products and/or services. A home energy management system is an example of a solution value product that provides energy saving solutions to customers. Experience value products and services provide an experience, e.g. a safe and secure experience. Vattenfall is aware of the need to provide more values to customers and create better customer relationships. Therefore, it chooses to expand its business in downstream customer interfacing businesses and position itself as a “smart energy enabler”.

Vattenfall’s competitors also discovered the opportunities in downstream customer interfacing businesses and the ability to provide various values to customers. Figure 4 illustrates the product portfolio of Vattenfall’s competitors in its core markets (Essent, 2011 ; Eneco, 2012 ; E.ON Benelux, 2010 ; Bixia, 2012 ; Yello, 2012 ; Yello, 2012 ; LichtBlick, 2011; RWE, 2012 ; E.on, 2012).

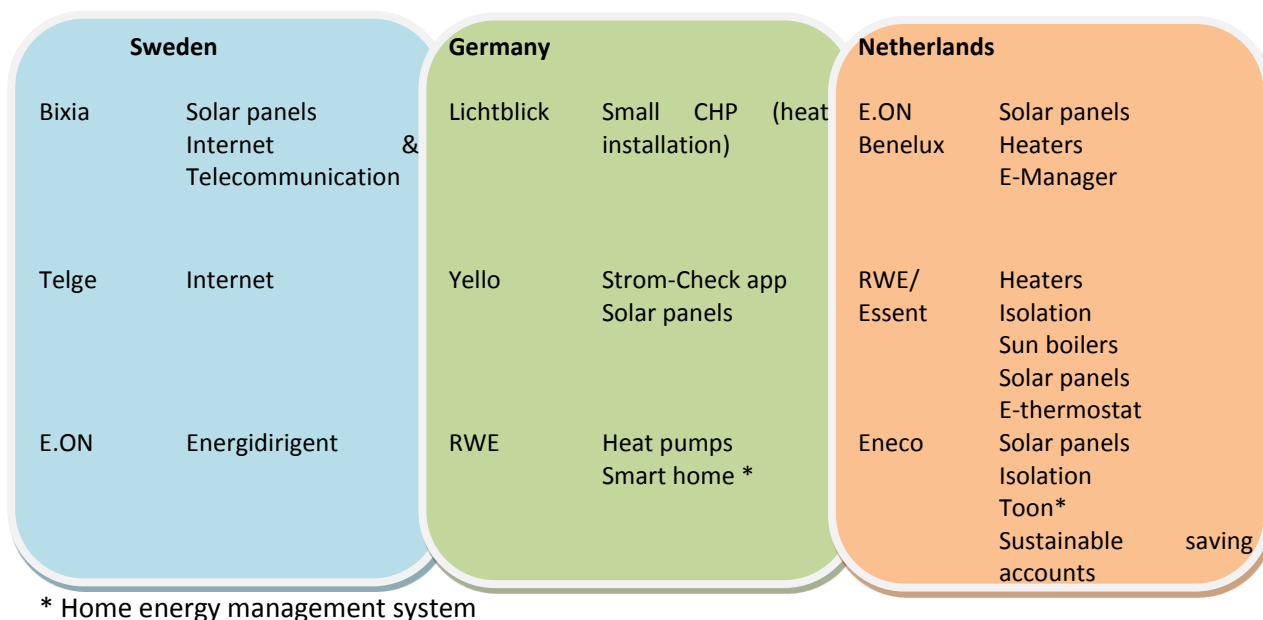


Figure 4 Competitor's product portfolio

Energy companies also invest in products that are not related to the energy market as is shown in Figure 4. For example, Eneco has sustainable savings accounts in its product portfolio. Other companies whose core market is not the energy market are also active in this energy-related market. For example Honeywell and Danfos are competing with Vattefall with their in-home displays even though the energy market is not their core market (passiefhuisbouwer, 2012).

To conclude, the strategy to expand business in downstream customer interfacing business in energy-related markets will provide Vattenfall better customer's relationships. New revenue streams are created that hopefully can guarantee Vattenfall's competitive advantage and market position.

#### 1.4. Research problem

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The energy-related market is not the core business of Vattenfall, and therefore Vattenfall does not have the required activities and resources in-house to commercialize the energy-related products and services successfully on its own. In practice few organizations have all the required activities and resources in-house (Ireland, 2002). This lack of the required activities and resources forces Vattenfall to either develop these activities and resources internally or to source the activities and resources through organizational relationships with organizations that have the required activities and resources in-house. Advantage of organizational relationships is that they enable organizations to attain some results which cannot be attained on their own in the same time frame and/or cost level (Madhak, 2002). In most cases, the required activities and resources can be sourced much faster and less expensive through organizational relationships than developing these internally from scratch.

It is vital to acknowledge the need to manage and control organizational relationships through organizational governance structures. Organizational relationships do not secure strategic benefits, growth and a boost by definition (Dyer, 2004).

Designing and implementing an organizational governance structure is of strategic importance. Organizational governance structures have an impact on day-to-day business on the short term or even impact on overall company performance on the longer term (Hutzschenreuter, 2011). An appropriate organizational governance structure can foster innovation and enhance competitiveness, but improper organizational governance structures can hamper success or overstretch the limited resources of the company.

Choosing an organizational governance structure that secures success is a challenge that is recognized in literature (Kehler, 2004) and practice. Vattenfall's experience with managing and controlling organizational relationships shows that previous decisions had different outcomes than expected. In 2006 Nuon<sup>1</sup> acquired Helianthos, the solar-activities of Akzo Nobel (Energia, 2006). In September 2011, Nuon published it wanted to stop with the solar-activities (van der Zee, 2011) and the 7th of May 2012 Helianthos was sold (Hazebroek, 2012). Recently, Vattenfall has decided to sell four subsidiary through which Vattenfall provided energy-related products and services to its customers. As of now, Vattenfall wants to provide these products and services through inter-organizational relationships (Kleijne, 2012).

It is noteworthy that decision-making processes concerning organizational governance structures are executed accurately. Better understanding must be gained regarding the management and control of organizational relationship, the aspects that are relevant to consider in designing an appropriate

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<sup>1</sup> In 2009 Nuon was acquired by Vattenfall. In the remaining report Vattenfall and Nuon are used interchangeably.

organization governance structure, and decision-making processes that concern organizational governance structures.

*The research problem is divided into a practical and a scientific research problem.*

**Practical research problem:** Organizations cannot always commercialize products and services successfully on their own because they lack the required activities and resources. Through organizational relationships organizations source the required activities and resources. Some previous decisions concerning the governance of organizational relationships, either inter or intra, have disappointed Vattenfall. Vattenfall questions itself whether their current decision-making process concerning organizational governance structures is satisfactory. It wants to have a support tool for the decision-making process concerning organizational governance structures for organizational relationships embedded in downstream customer interfacing businesses in the energy-related markets.

**Scientific research problem:** Various scholars have analyzed organizational governance structures and their performance. However, no research has been performed yet regarding a support tool for decision-making processes concerning organizational governance structures for especially downstream customer interfacing businesses in energy-related markets. In addition, no evidence has been found regarding research that links the research field regarding organizational management with the research field regarding decision-making processes in multi-actor setting and identifies the impact they have on each other.

## 1.5. Research objective

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The primary objective of this research is to gain a better understanding regarding the decision making process concerning organizational governance structures. Relevant aspects that need to be considered during the decision-making process concerning organizational governance structures, the relations between these aspects, and how to design an organizational governance structure based on the aspects, need to be identified. The identification of these is needed for the ultimate objective of this research. The ultimate objective is the design of a framework that supports decision-making processes concerning organizational governance structures.

It should be noted that a framework and not a model is chosen to operate as a support tool. Frameworks and models are used almost interchangeably and for that reason the choice is briefly explained to prevent miscommunication regarding the ultimate objective.

A framework is chosen because *“Frameworks identify the elements and general relationships among these elements that one needs to consider for institutional analysis and they organize diagnostic, and prescriptive inquiry”* And *“The elements contained in a framework help analysts generate the questions that need to be addressed when they conduct an analysis”* (Ostrom, 2011).

A model is not chosen because the support tool needs to be capable of handling various situations. Models are used to make assumptions about a set of variables to make precise predictions about the results that derive from a combination of variables using a particular theory. They are well tailored to



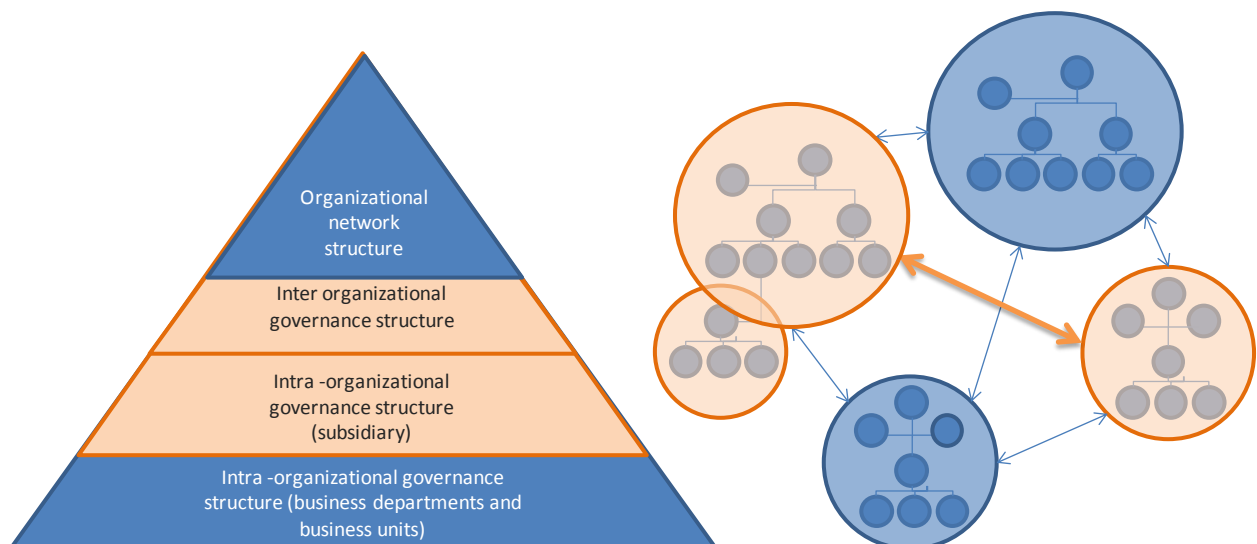
a particular situation (Ostrom, 2011), and for that reason they are not useful to apply when the situation differs from the particular situation for which the model is designed. A model is an inappropriate tool to function as the support tool for decision-making processes concerning organizational governance structures because the designed tool should be suitable for various situations.

## 1.6. Research scope

This research focuses on organizational relationships between Vattenfall and energy-related organizations. Such a relationship between two partners is called a bilateral relationship. Organizational relationships can also be performed between three or more organizations. This is referred as an organizational network. This research does not consider organizational networks. The reason to scope the research to bilateral organizational relationships is to limit the complexity that is present in organizational networks. By limiting the complexity, it is believed that better understanding is gained regarding the management and control of organizational relationships.

There is a distinction between inter- and intra-organizational relationships and also between the two types of intra-organizational relationships, namely subsidiary versus business departments and units as shown in Figure 5. This research only focuses on the second and third layer in the pyramid; the orange colored layers and circles. An in-depth analysis concerning business departments and business units is not conducted.

Furthermore, organizational relationships between Vattenfall and organizations that are not active in energy-related markets, and organizational relationships between private and public organizations fall outside the scope of this research. Geographically this research focuses on the core-markets of Vattenfall: Sweden, the Netherlands, and Germany.



**Figure 5 Scope in organizational relationships**

The business strategy of Vattenfall is to expand its business through downstream customer interfacing businesses and not upstream, and therefore, the scope of this research is limited to

downstream customer interfacing businesses. Both business to business, e.g. commercial/real estate or equivalent, and business to customers, e.g. residential, is considered in this research. By focusing on downstream businesses, only relationships that prolong the vertical supply chain downstream fall within the scope.

Finally, the period of observation is from 2000 till 2012.

### 1.7. Research relevance

In spite of the large numbers of studies that analyzed organizational governance structures, few deal with organizational relationships between energy and energy-related organizations. Neither has the researcher found evidence of research that analyzed the relationship between organizational management and decision-making processes in multi-actor setting. The scientific contribution of this research is to make a link between the research field regarding organizational management and the research field regarding decision-making processes in multi-actor setting. The complexity in organizational management versus the complexity in decision-making processes in multi-actor setting is discussed.

Moreover, few studies analyze the choice for an organizational governance structure and the performance of the organizational relationships at the same time (Gulati 2008). This research considers both the choice as well as the performance of organizational relationships.

This research also has a managerial and social relevance. As illustrated in paragraph 1.4, organizational governance structures do not guarantee promising results automatically. It is difficult to design the most appropriate organizational governance structure to guarantee promising results. For managers, it is useful to have a support tool available to prevent from making inaccurate decisions concerning the organizational governance structure. From a managerial perspective, the relevance of this research is the design of a framework that supports decisions concerning organizational governance structures.

The social relevance is that greater values will be received by customers when Vattenfall has the ability to implement appropriate organizational governance structures to govern the expansion in downstream customer interfacing businesses within the energy-related markets. These values can be observed beyond the customer because society and environment will also benefit from these added values.

### 1.8. Main research question

Based on the research focus described in paragraph 2.2 the main research question is formulated as follows:

*Which aspects should be considered in a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets?*

The *organizational governance structure* illustrates how the transactions in organizational relationships are managed and controlled. *Downstream customer interfacing businesses* are the businesses that focus on the customers. These businesses provide products and services which customers can use in their daily work. *Energy-related markets* stands for markets that produce or provide products and services that either make use of energy or have the ability to affect the consumption of energy in an efficient way.

To design a framework that supports decision-making processes of Vattenfall, it is important to analyze theory and practice. The reason to analyze both theory and practice is that both provide insights in organizational governance structures, aspects that are relevant to consider and decision-making processes. By designing the framework based on theoretical and practical findings, it is assumed that a more practicable, suitable framework is designed that can support decision-makers in their daily work.

## 1.9. Research phases and sub-questions

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This research is divided into three phases in order to answer the main research question. Each phase is further divided into several sub-questions.

### **Phases I: Theory and Practice**

Purpose: To identify the theoretical lens and practical findings through which the organizational governance structure can be analyzed and the similarities and differences between theory and practice.

1. What is the purpose of organizational governance structures and what underpins organizational governance structures? [Chapter 2]
2. Which theoretical constructs should be considered to analyze organizational governance structures? [Chapter 3]
  - a. Which theories are applicable to analyze organizational governance structures?
  - b. Do the chosen theories provide insights into the choice for a particular organizational governance structure and how?
  - c. What are the similarities and differences between the theories and how do they complement each other?
  - d. Which relevant constructs can be determined from the theories and how can these be operationalized and measured?
3. Are TCE and RBV useful theories to analyze the governance of organizational relationships between Vattenfall and energy-related companies? [Chapter 4]
  - a. Which products and services does Vattenfall provides through organizational relationships?
  - b. What are the characteristics in which the intra- and inter-organizational relationships are embedded?
  - c. Which organizational governance structures did Vattenfall choose to govern the relationships?

- d. Are there similarities and differences between theory and practice and among the cases?
- 4. What are the characteristics of decision-making processes concerning organizational governance structures and how do these characteristics affect the decision-making process? [Chapter 5]

### **Phase II: Framework design**

Purpose: To design a framework that supports decisions concerning organizational governance structures.

- 5. How should the framework be designed? [Chapter 6]
  - a. Along which steps should the framework be designed?
  - b. What are the design requirements and the design space?
  - c. How should the framework be designed based on the requirements and the design space?

### **Phase III: Conclusions, recommendations, and reflection**

Purpose: To elaborate on the strength and weaknesses of the framework and decision making process.

- 6. How should decision-makers use the framework? [Chapter 7, 8, & 9]
  - a. What are the strengths and limitations of the framework?
  - b. How can the framework be applied during decision-making processes concerning the organizational governance structures?
  - c. Which overall conclusions can be drawn regarding the framework design and which recommendations can be given to Vattenfall and to further research?
  - d. What are the strengths and limitations of the design process and how does the design process affect the framework?

## **1.10. Research approach**

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To structure and guide the research process, the research approach is based on a sequence of steps. Between the steps, iterations take place. Figure 6 gives an overview of the research approach.

This research starts with the identification of organizational governance structures and theoretical constructs that provide insights into the decision making process concerning organizational governance structures.

To gain practical findings regarding the topic, two cases of Vattenfall are analyzed profoundly. This is the deductive as well as the explorative part of the research. The energy-related products and services and the organizational governance structures implemented are analyzed in order to verify if theoretical constructs defined by the chosen theories are applicable. By comparing theory and practice, differences, and similarities between theoretical and practical findings are discussed. Thereafter, the decision-making process is analyzed in order to gain a better understanding of the

characteristics of decision-making processes concerning organizational governance structures, and how these influence the design possibilities and introduce social systems to the subject at the same time.

The framework is designed based on the knowledge retrieved from the theoretical and the practical analysis. This part of the research is inductive. A new framework based on theoretical and practical findings is created. In the end, this framework is evaluated in order to gain insights in the strengths and limitations of the framework.

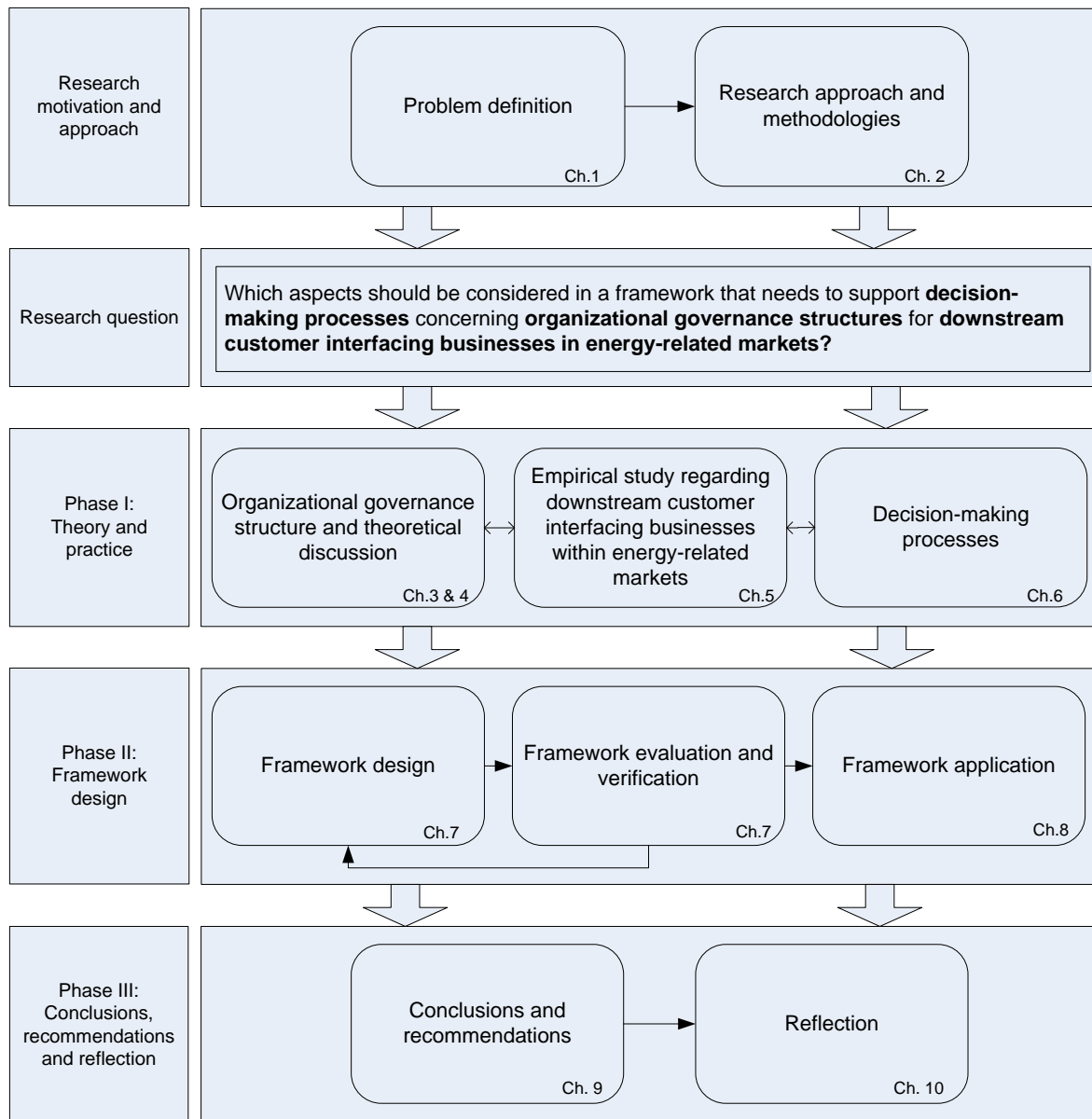


Figure 6 Research approach

### 1.11. Research methodologies, methods and data collection

To execute an appropriate research various methodologies and methods are used, see Table 1

Table 1 Methodologies and methods

Research step	Methods and methodology
Problem definition	PEST-analysis Desk research
Organizational governance structure analysis	Desk research
Empirical study	Case study analysis Interviews
Decision-making process analysis	Desk research Observations/ interviews
Framework design	META-model combined with Workshop
Framework verification	Survey

A brief PEST analysis is conducted to get insights in the drivers behind the challenge Vattenfall faces caused by different forces. A desk research is also conducted to get more insights in the challenges and problems at stake.

A desk research is conducted to review theories that discuss the management and control of organizational relationships and how a particular structure should be designed. Theories make it possible to move beyond simple observations and descriptions. They enable to predict relationships between phenomena which are in the interest of this research. Thus, relevant aspects discussed in literature, and the relation between the aspects and organizational governance structures are identified.

This knowledge is used in order to execute the case study analysis. A case study analysis is well suited to produce context-dependent knowledge (Flyvbjerg, 2006). Through a case study analysis, a systematic way of looking at events, collecting data, analyzing information, and reporting results is established. Case studies are one of the best bridges from qualitative evidence to mainstream deductive research (Eisenhardt, 2007). In addition, a case study analysis is well suited to analyze 'How' and 'Why' questions (Yin, 2003). The case study analysis is executed in order to identify how Vattenfall governs its organizational relationships. By analyzing the current organizational governance structures it becomes possible to evaluate aspects that are considered in practice and make remarks regarding the cases from a theoretical perspective.

To design the framework, the META-model in combination with the design approach of Pepper (2007) is used to structure the design process. The META-model is chosen because it clearly illustrates the need to define the design requirements and design space but it lacks in giving insights into what determines the design requirements and design space. By combining the META-model with the design approach of Pepper (2007) the design requirements and design space arise from the problem definition and research objective.

A workshop is conducted to improve the design of the framework. During the workshop, the concept of the framework is primarily demonstrated and after that the conceptual framework is evaluated. With the feedback of the participants, the framework is improved. To verify the framework a survey is taken among experts instead of another case study analysis in order to be able to verify the framework in the given research period.

To collect data, various resources are approached, such as newspapers, legal documents, websites, annual reports, and scientific search websites: Science direct and Scopus. To collect empirical data in Vattenfall open and semi-structured interviews were taken. Open interviews were conducted to gain insights in topics that are not well discussed in literature, such as the content of contracts. The questions for the semi-structured interviews are based on literature. Later new additional questions are introduced based on answers obtained from previous interviews. The list of questions served as an interview guideline. See appendix B for the list of questions which were discussed during the semi-structured interviews. Interviewees are Vattenfall employees who are involved in the case. In order to have complete information regarding the decision-making process concerning organizational governance structures it is important to collect data from both organizations, Vattenfall and its partner. Unfortunately interviews with the external company were not possible because the external company did not have time to cooperate.

#### 1.12. Report structure

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Chapter 2 discusses the purpose, and elements that underpin organizational governance structures. In chapter 3, TCE and RBV are discussed to get a better understanding which aspects are relevant to consider. In the following chapter 4, the empirical study is described. With the empirical study practical findings are gained which are useful to verify whether the applied theoretical constructs are useful. Chapter 5 elaborates on decision-making processes, their characteristics, and their impact on decision-making processes concerning organizational governance structures. Chapter 6 discusses the design of the framework. Chapter 7 describes the limitations and application of the decision framework. In chapter 8, conclusions and practical recommendations are given. And finally, the reflection on the research approach, research design, final result and scientific relevance is discussed in chapter 9. Chapter 9 also include the further research recommendations.

# PHASE I

## Theory and practice

Chapter 2: Organizational governance structures

Chapter 3: Theoretical lens

Chapter 4: Empirical study

Chapter 5: Decision-making processes and social systems



## 2. Organizational governance structures

---

*This chapter analyzes and answers the first sub-question ‘What is the purpose of organizational governance structures and what underpins organizational governance structures?’ Before discussing the definition and types of organizational governance structures in paragraph 2.2, the purpose of organizational governance structures in relation to organizational relationships is explained in paragraph 2.1. Following the contract types, financial structures and control mechanisms that underpin organizational governance structures are described in paragraph 2.3 to 2.5. Paragraph 2.6 formulates the conclusion regarding sub-question 1.*

### 2.1. Organizational relationships

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Organizational relationships between organizations can provide new opportunities to the organizations that enter into the relationship, such as access to new activities and resources accelerated speed to market, sharing risks, increasing productivity, and learning and gaining experience in a new fields.

Organizational relationships can face risks that undermine the success of the relationship. The risks that can accompany organizational relationships can be divided into relational risks and performance risks. Relational risk is defined as the probability and consequence of not having a smooth collaboration between the organizations. Performance risks concern the prospect of achieving strategic goals, such as high profits, or a greater market position. Performance risk is defined as the probability and consequence that the performance targets are not met even though the collaboration is satisfying (Das, 1996). Das (1996) suggests that relational risk and performance risk are conceptually independent of each other. They are rooted in different domains and differentiate in terms of their resources. Relational risk is rooted in inter-organizational relationships and is caused by internal factors. Performance risk is rooted in a competitive environment and is caused by external factors (Das, 1996).

To manage the risks that are influenced by internal and external factors appropriate organizational governance structures are needed.

### 2.2. Definition and types of organizational governance structures

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Organizational governance structures are important to guarantee the creation and appropriation of the opportunities provided by organizational relationships. According to Williamson (1979) a governance structure is the institutional framework in which the integrity of a transaction is decided. Nooteboom (2004) defines a governance structure as a structure through which behavior is managed or literally steered. Organizational governance structures shape organizational relationships and control risks that accompany these relationships. In this research, an organizational governance structure is defined as the structure through which the risks that accompany organizational relationships are managed and controlled.

Organizational governance structures can consist of intra- and inter-organizational governance structures. Both intra- and inter-organizational governance structures can be implemented to

manage and control organizational relationships. An intra-organizational relationship is when two organizations agree on an acquisition where one organization gets ownership over the other, and the other company continues to operate as a subsidiary. Inter-organizational governance structures are implemented to manage and control relationships between two private organizations.

Analyzing decision-making processes concerning organizational governance structures is a challenge. A part of the challenge is caused, by the difficulty to delineate the many types of elements that underpin organizational governance structures (Kehler, 2004). Second, the effectiveness of various types of organizational governance structures to cope with the risks involved in the organizational relationship can be almost equal. There is not one particular organizational governance structure that can be implemented to govern a certain organizational relationship embedded in a certain context.

Organizational governance structures are most often ranked along the market-hierarchy continuum (van de Vrande, 2009). The three broad discrete categories in which the organizational governance structures are most commonly divided are: market, hybrid or intermediate, and hierarchical structures (Macher, 2008).

A part of literature argues that the level of control differs along the market-hierarchy continuum. Hierarchical structures have a higher level of control than hybrid and market structures. The reasoning behind the level of control along the market-hierarchy continuum is that the more hierarchical the financial structure the more control the acquiring company can exercise through authority. Another part of literature argues that the linear market-hierarchy continuum is too simplistic. Van der Vrande (2009) argues that the concepts should rather be multi-dimensional than linear. This research takes Van de Vrande's argument into account and makes a distinction between output and process controls.

Each type of organizational governance structure is underpinned by a contract type, a financial structure, and control mechanisms, see Table 2. The different contract types, financial structures, and control mechanisms are explained in the following paragraphs.

Table 2 Organizational governance structure				
	Hierarchical	Hybrid		Market
Contract type	Agreements among departments, subsidiary and focal company	Relational contract		Classical contract
Financial structure	Merger Acquisition	Equity alliance such as: Joint venture Consortium	Non-equity alliance such as: Franchising Licensing Long-term subcontracting	Arms'-length contract: Buyer-Supplier contract
Control mechanisms	Output control			
	Process control			
	Social control			

Source: Dekker (2004), Donato (2010) Jhonson (2011) and Williamson (1979)

### 2.3. Contract type

Contracts serve as a framework for the coordination of inter-organizational relationships. Therefore, only hybrid and market organizational governance structures are underpinned by contracts, whereas hierarchical governance structures are not.

There are two types of contracts that operate in the business environment that underpin inter-governance structures (Donato, 2010; Williamson, 1979). There are classical and relational contracts. Table 3 provides an overview of the contract characteristics.

Table 3 Contract characteristics	
Classical contracting	Relational contracting
Fully specified contracts, clear-cut, complete	Incomplete contracts
All future contingencies and allocation of risk are specified from the outset and remedies are narrowly prescribed.	The impossibility to predict future contingencies and risks is considered
The identity of the contract parties is irrelevant	Identities of contract parties are relevant
Third party settles the dispute	Disputes are settled between the parties
Standardized transactions	Non standardized transactions

Source: Donato (2010) and Williamson (1979)

Classical contracts support market organizational governance structures and relational contracts support hybrid organizational governance structures. The classification in these two broad types of contracts do not include the complete variety that is possible within contracts. This variety in contracts makes it hard to identify a pattern between contract content and the context in which the organizational relationship is embedded. This research does not focus on the identification of this pattern.

### 2.4. Financial structure

The financial structures are categorized along the market-hierarchy continuum and vary in their control effect. The four categories of financial structures are: merger or acquisition, equity alliance, non-equity alliance, and at arms'-length contracts.

Hierarchical financial structures, such as mergers or acquisitions, exercise control through authority and involve giving orders to subordinates and evaluating their performance. The advantage of hierarchical financial structures is the ability to overcome information asymmetry. The disadvantage of hierarchical financial structure is that they can lead to over-bureaucratization and inefficiency, because of the absences of market forces.

Examples of hierarchical financial structures are mergers and acquisitions. A merger is a combination of two separate organizations in one company. An acquisition is a takeover of one company by another company (Jhonson, 2011).

Hybrid financial structures, such alliances are voluntary and cooperative agreements with the aim to achieve advantages for both partners. The organizations remain separate independent organizations

that share activities and resources. There is a variety of alliances, such as horizontal alliances between competitors, vertical alliances between buyer and supplier, and diagonal alliances between organizations in different industries. Between the various types of alliances, a distinction can be made between equity and non-equity alliances. Organizations can either consider an alliance with equity sharing or without. (T. K. Das, Teng, B.S., 2001; Johnson, 2011). Hybrid financial structures exercise control through equity (Das, 1998). The higher the equity shares of the focal company in the partner, the greater the focal company can exercise control on the partner because equity gives financiers voting powers, access to information and rights of control (Hendrikse, 2001). Examples of equity alliances are joint ventures and minority equity alliances. A joint venture is a separate entity but jointly operated by organizations that closed the joint venture. Minority equity alliances involve one organization that takes equity at stake in a partner. Non-equity alliances are contractual agreements where no equity is involved. Non-equity alliances provide strategic flexibility, because the organizational relationship can be ended without great financial problems because there is no equity involved.

The relationship between the organizations in a market financial structure is driven by market forces, and the transaction is completed with little or no social interaction (Fink, 2007). An advantage of market organizational governance structure is that there are no or almost no financial consequences when ending the organizational relationship. Market financial structures are underpinned by at arms' length contracts, such as the simple buyer-supplier contract.

Summarized, the main difference among acquisition, equity alliance, non-equity alliance, and buyer-supplier contracts is that:

- Acquisition concerns resource ownership
- Equity and non-equity alliance concerns resource sharing
- Buy-supplier contract concerns purely the selling and buying of products and services

In addition the flexibility among these differs. The greater the market characteristics, the greater the flexibility.

## 2.5. Control mechanism

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Besides contracts and financial structures, organizational governance structures also include control mechanisms (Williamson, 1979). Control mechanisms are mechanisms that create the conditions that mitigate risks and/or motivate the organizations to achieve desirable and predetermined performances (Dekker, 2004). Control mechanisms consist of outcome, behavior and social controls. Outcome and behavior controls are formal control mechanisms. Social controls are informal control mechanisms. The types of control mechanisms are not related to the market-hierarchy continuum.

Outcome control mechanisms specify the outcomes that need to be realized and monitor the achievements of the targets through performance indicators. Behavior control mechanisms specify how the organizations should act and monitor the behavior of the organizations in order to determine whether the behavior of organizations comply with the pre-specified behavior (T. K. Das, Teng, B.S., 2001; Dekker, 2004). Social control mechanisms are soft measures through which goal and preference incongruence can be reduced (T. K. Das, Teng, B.S., 2001). The purpose of social control is

to create shared norms, values, and beliefs. Table 4 provides examples of outcome, behavior, and social control mechanisms.

Table 4 Control mechanisms		
Outcome control (output)	Behavior control (process)	Social control
Setting objective, Targets (qualitative) Planning and budgeting	Policies Operating procedures Staffing and training Reporting structures Authority structures	Participatory decision-making process Networking

Source: Dekker (2004) and Das (2001)

Three types of control mechanisms support organizational governance structures to manage and control the organizational relationships successfully. With successful is meant that the targets are met and the organizations act in accordance to the agreements they made with each other. Which mechanisms are suitable to control the organizational relationships depends on the risks that accompany the relationship (T. K. Das, Teng, B.S., 2001; Smith, 2008).

In this research, the financial structure and control mechanisms of the governance structure are analyzed. To limit the scope of the financial structures the following four financial structures are selected; acquisition, equity alliance, non-equity alliance, and buyer-supplier contracts. Merger is not incorporated in this research because it is unlikely that Vattenfall and the energy-related companies will merge as they are not equal partners who will merge.

## 2.6. Concluding remarks

This chapter started with the question: *What is the purpose of organizational governance structures and what underpins organizational governance structures?*

The purpose of organizational governance structure is to manage and control organizational relationships by mitigating the risks that accompany organizational relationships. By mitigating the risks, the organizational governance structures can guarantee that the opportunities provided by the organizational relationship are created and appropriated. To mitigate the risks it is important that organizational governance structures fit in the context in which organizational relationships are embedded. The context is discussed in the following chapters.

Organizational governance structures are underpinned by a contract type, a financial structure, and control mechanisms. There is a wide variety in these elements that underpin organizational governance structures and a variety of combinations among these constructs are possible. This variety makes it challenging to analyze the organizational governance structures and to find a significant pattern among the elements. To narrow the variety in financial structures, only acquisitions, equity and non-equity alliances, buyer-supplier contract are considered in this research. Furthermore, the contract type are not considered to narrow the scope of analysis.



### 3. Theoretical lens

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This chapter elaborates on the theoretical lens that is applied to determine the appropriate organizational governance structure. First, the choice for considering transaction cost economic (TCE) in combination with the resource-based view (RBV) is explained. Second, TCE and third, RBV are briefly explained. Fourth, the similarities and differences among these theories and how they complement each other are discussed. Paragraph five concentrates on the operationalization of the theories. With this information the question: *Which theoretical constructs should be considered to analyze organizational governance structures?*, is answered in paragraph six.

#### 3.1. Theoretical choice

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Various theories and models have been applied to gain a better understanding in organizational relationships, especially how these should be managed and controlled through an organizational governance structure, and which criteria or aspects are relevant to consider during the decision-making processes (Leiblein, 2003; Macher, 2008; Shook, Adams, Ketchen, & Craighead, 2009).

In this research, TCE and RBV are primarily chosen to design the framework that needs to support decision-making processes concerning organizational governance structures. The underlying reason to choose TCE is because TCE has emerged as the dominant theory to analyze the choice of a particular organizational governance structure (Das & Teng, 2000; Leiblein, 2003). Oliver Williamson introduced TCE in the mid-1975s and over the twenty years since, there have been substantial theoretical as well as empirical developments. Various researches have claimed to corroborate TCE reasoning with their empirical evidence.

Yet considerable criticism remain regarding some constructs of the TCE, and whether TCE is entirely suitable to analyze organizational governance structures. TCE does not assign significant role to the resources that are exchanged (Leiblein, 2003). Furthermore, TCE is static and lacks to cope with dynamism in such decisions. To cope with the number of critics and create a more holistic view it is necessary to extend the TCE with other theories. The need to employ multiple theoretical lenses to design a more holistic view is a well-known concept in research. Each theory provides a different lens with valuable insights and the combination of theories provides a more holistic view.

In this research, TCE is extended with RBV. RBV is chosen because there have been academic calls to extend TCE with RBV over the past years (Donato, 2010; Leiblein, 2003). Madhok (2002) argues, decision-making processes concerning the choice of organizational governance structures should not just rest on costs but also on resources which is the domain of RBV. The underlying reason is that organizational governance structures should not only secure cost-efficiency but also create values (Madhok, 2002). Furthermore, the resources of organizations provide opportunities and/or constraints which should be considered during these decision-making processes to design the most appropriate organizational governance structure, and for that reason RBV is chosen in combination with TCE.

### 3.2. Transaction cost economics

TCE builds upon two assumptions. The primary assumption Williamson considers is the limit of human cognition, i.e. bounded rationality. Despite the intention of an individual, individuals may never act rational and far-sighted. Humans are limited in accessing, storing, processing, and communicating information (Macher, 2008). The second assumption is opportunism. Williamson (1985, p.47): *“By opportunism I mean self-interest seeking with guile. [...]. Opportunism more often involves subtle forms of deceit. [...]. More energy generally, opportunism refers to the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, obfuscate or otherwise confuse”*.

The objective of TCE is to minimize the transaction costs by aligning transactional properties to an appropriate governance structures. This is also known as the make-or-buy decision. Transactions occur when products or services are transferred across separable interfaces. As Donato (2010) defines: *“transaction costs include ex ante costs of searching and identifying potential partners and in negotiating and implementing contracts, and ex post costs of monitoring and enforcing contracts”*. den Butter (2012) defines three stages wherein transactions take place. These stages impact either the ex ante or ex post transactions costs, see Figure 7.

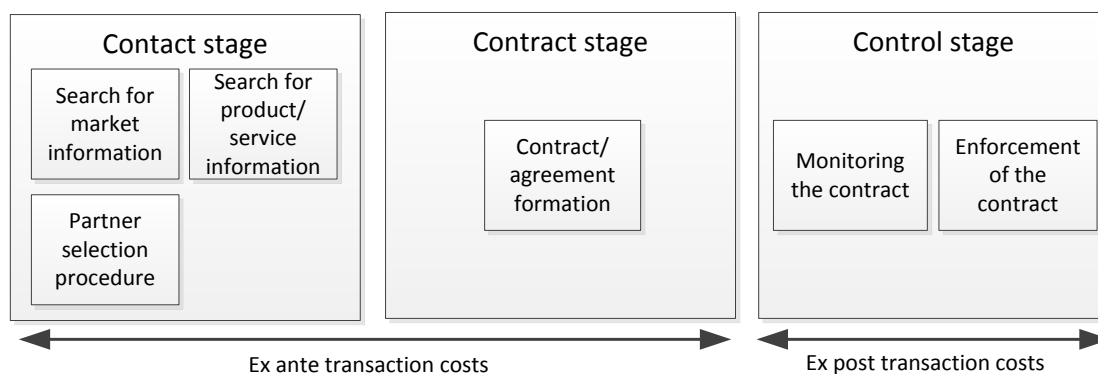


Figure 7 Transaction stages

Not all of these ex ante and ex post transaction costs can be measured directly. Through the transactional properties identified by Williamson, these costs can be analyzed indirectly. The core transactional properties with which the transaction cost can be identified indirectly are asset specificity, uncertainties, and frequency.

Assets are valuable aspects of organizations. Williamson identifies several types of asset specificity, mainly; site, physical, human, brand-name, dedicated, and temporal asset specificities. The degree of asset specificity is either non-specific, mixed or idiosyncratic (Currie, 2004). Asset specificity refers to the transferability of the assets without value reduction. These specific assets only sustain their value in the context of the exchange. The difference between specific and specialized assets should be noted and not be confused. Specialized assets refer to assets which are specialized in a certain activity or skills. Where specific assets cannot be transferred to another context without significant value reduction, specialized assets can without any value reduction. In some cases, specialization and specificity are intertwined (Aubert, 2001; Watjatrakul, 2005).



Uncertainties are “*unanticipated changes in circumstances surrounding an exchange*” (Noordewier, 1990, p. 82) and is divided into environmental and behavioral uncertainties. Environmental uncertainties are changes in the environment that are outside the control of Vattenfall and the partner. Environmental uncertainties have an impact on the performances of the organizational relationship, examples are demand uncertainties and product technological uncertainties. Behavioral uncertainties refer to the difficulty to monitor and evaluate the performance of the partner. Frequency refers to occasional and recurrent transactions (Macher, 2008; Watjatrakul, 2005).

From a TCE perspective, the choice for a particular organizational governance structure depends on these transactional properties. The organizational governance structure can be described as a function of asset specificity, uncertainties, and frequency (Klein, 2004; Macher, 2008). In other words, the governance structure is the dependent variable and the transactional properties are the independent variables.

Empirical studies have found strong evidence regarding the relation between asset specificity and hierarchical governance structures. The higher the asset specificity the more likely the governance structure will be hierarchical. Both organizations are motivated to collaborate, either to protect the value of the assets or to limit the transaction costs (Buvik, 2002). To understand the motives behind the organizations for a close or loose collaboration depends on their perspective on asset specificity. The company that has specific asset investments faces the ‘lock-in’ effect. It is locked in the organizational relationship because these assets reduce in value when they are no longer used by the partner. If the company with the specific asset investments has the ability to incorporate with another partner, the value of the asset still reduces. These assets are specific, and for that reason they do not fit the new partner precisely, and as a consequence the value of the assets reduce. To safeguard the value of the assets and its return of investments, the company with the specific asset investments seeks to have a close relationship with the partner for whom these specific investments are made. For the other company for whom these specific assets are complementary and who has not made specific investments, it is also in its advantage to have a close relationship. Seeking for another partner who can provide the same activity, product and service, or training the new partner to do so is costly.

Figure 8 illustrates the expected governance costs as a function of asset specificity associated with hierarchical  $H(k)$ , hybrid  $X(k)$  and market  $M(k)$  organizational governance structures. Governance costs are a class of transaction costs (Gulati 2008).

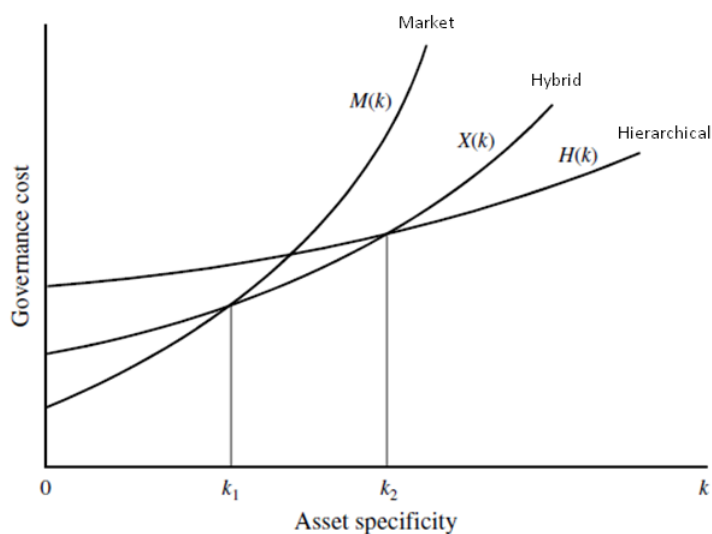


Figure 8 Governance cost curve

This graph provides a visual understanding why hierarchical organizational governance structures fit the most when there are highly specific assets present from a cost-efficient perspective. Organizational relationships where the asset specificity is lower than  $K_1$  can be best managed and controlled through market organizational governance structures, whereas, between  $K_1$  and  $K_2$  with a hybrid structure and higher than  $K_2$  hierarchical organizational governance structure (Gulati 2008).

The relation between uncertainties and frequencies with the organizational governance structures have no strong empirical evidence compared to the relation between asset specificity and organizational governance structures. Empirical findings that relate uncertainties with governance structures are mixed, partly because of the multitude of uncertainty types and the variety of measures employed in literature (Leiblein, 2003; Macher, 2008; van de Vrande, 2009).

Empirical findings have, however, shown that the combination of high uncertainties with high asset specificity makes hierarchical structures more favorable than market structures. Previous studies have failed to confirm the relation between frequency and organizational governance structures. In addition, the interaction effect between frequency and asset specificity on the organizational governance structure has not truly been confirmed by empirical evidence (Macher, 2008; Watjatrakul, 2005) and in view of that frequency is no longer considered in this research.

Since the choice for an organizational governance structures depends on the transactional properties and the relation among these, the decision-making process becomes quite a complex process. If one wants to reduce the complexity one can consider a simpler and general 'rule of thumb'. Hierarchical governance structures should be considered when the partner engages the same activities in the same market and in all other cases, i.e. when activities and markets differ, hybrid governance structures should be implemented. If this rule of thumb would be applied, than one would expect to find vertical disintegration and horizontal integration in practice. As can be found in practice are there exceptions to the 'rule of thumb' (B. Nooteboom, 2004). These exceptions to the 'rule of thumb' are of interest in this research since vertical disintegration and horizontal integration are not of interest. It is better to consider Williamsons reasoning completely than considering this 'rule of thumb'.

Table 5 illustrates which organizational governance structure is most efficient based on Williamson reasoning regarding the relation between asset specificity, uncertainties, and organizational governance structures. Notice the different types of hybrid structures.

Table 5 Efficient organizational governance structures from asset specificity and uncertainty perspective

		Uncertainty		
		High	Moderate	Low
Asset specificity	High for both	Hierarchical	Hierarchical	Hybrid (hierarchical)
	High and moderate	Hierarchical	Hybrid (hierarchical)	Hybrid (market)
	Hybrid (hierarchical)	Hybrid (hierarchical)	Hybrid (market)	Hybrid (market)
	Moderate and low	Hybrid (market)	Hybrid (market)	Market
	Low for both	Market	Market	Market

Source: Extended governance structure from Williamson (1979)

### 3.3. Resource-based view

During the 1990s, the interest in the resource-based view (RBV) of the organization increased due to the fact that the environment in which organizations are active became more unstable. It is more secure to formalize strategies based on internal resources and capabilities rather than external market aspects in unstable markets (Grant, 2010). RBV is one of the most widely accepted theories of strategic management.

RBV adopts the notion that organizations should be defined as a bundle of resources. RBV builds on the assumption of resource heterogeneity, which means each organization possesses different resources compared to their competitors. It also builds on the assumption that these resources are imperfectly transferred between organizations, also defined as resource immobility. The necessity of resource immobility is to secure that resources are less valuable to potential bidding organizations than to the focal organization (Leiblein, 2003).

The objective of this theory is to increase the performance or competitive advantage through the resources of the organization rather than to minimize costs of transacting (Das & Teng, 2000; Donato, 2010). The attributes of strategic resources have gained a lot of attention in literature.

According to Barney (1990) resource that are: valuable, rare, inimitable, and non-substitutable (VRIN) can be defined as strategic resources. Resources are valuable if they provide opportunities and mitigate threats. If the number of competitors that possess the valuable resource is small and the resource demand exceeds the supply, the resource can be considered as a rare resource. Inimitable resources are resources that are difficult to replicate. Non-substitutable resources are resources that are not replaceable by other resources (Leiblein, 2003; McIvor, 2009). Resources that possess the VRIN attributes can be considered as strategic resources with which organizations can gain better performances and competitive advantage. These strategic resources exploit opportunities in markets or neutralize threats of competitors (Watjatrakul, 2005).

The list of resources of organizations is rather extensive. Various scholars have proposed a number of resource typologies (Barney, 1990; Daft, 1983; Grant, 2010; Hofer, 1978). The underlying reason why there are so many different typologies is that the boundaries, constituents, and definitions are widely interpreted according to the perspective of different interest groups (Galbreath, 2005).

Resources and capabilities are used interchangeable in literature. Most empirical research has made the distinction between tangible and intangible resources. Tangible resources are resources that contain financial or physical value. Intangible resources are the resources that are non-physical (Galbreath, 2005). From these resources, much attention has been given to the importance of intangible resources, such as knowledge (Galbreath, 2005; Leiblein, 2003) because various authors argue that these intangible resources secure competitive advantage. They argue that tangible resources are easier to replicate than intangible resources, it is therefore expected that tangible resources do not significantly contribute to competitive advantage. However some scholars argue the importance of broadening the scope of resources beyond intangible resources (Galbreath, 2005). Foss (1997) claims that there are numerous empirical examples where tangible resources provide competitive advantage. Based on these findings the resource portfolio should consist of tangible as well as intangible resources.

Although RBV is interested particularly in analyzing the relation between the resources and the business performances or the competitive advantage of organizations, RBV is also useful to analyze organizational governance structures. Compared to TCE, the relations between the resource attributes and the organizational governance structures have not been discussed as widely as the relations between the transactional properties and organizational governance structures.

At its most basic level, RBV suggests that strategic resources should be owned or at least to a large extent controlled by the focal company. The more the resources are strategic, the higher the likelihood that a hierarchical governance structure will be chosen (Leiblein, 2003). This is rather a too simplistic reasoning. Next to Leiblein (2003), Dunne (2009) elaborates further how organizational governance structures can be chosen from a resource perspective. Dunne (2009) elaborates on various resources organizations may have and concludes that the presence of various resources make it more likely that organizations choose for expansive control over their own resources rather than share the control or give it to another company. Based on this, the presence of a particular set of resources influences the choice for a particular organizational governance structure. The more these valuable resources are present within an organization the more likely a market structure will be chosen over a hybrid and a hybrid over a market.

Based on Dunne's (2009) findings and observation regarding the energy-related market, this research assumes that technical, commercial, social, and financial resources are important in the energy-related market. Technical resources are the technologies and the ability to come up with new technologies, e.g. technical knowledge (Dunne, 2009). Technical resources are vital in the energy-related market because some energy-related products and services have high technical characteristics. Having technical resources gives the company an advantage because it has the ability to create new high tech products and services. Commercial resources are the resources that support the marketing and sales of the products and services. In the downstream customer interfacing business, this is an valuable resource because the customer portfolio is rather large compared with

upstream interfacing businesses. There is a need for commercial resources in order to secure leads and eventually product and service sales. Social resources represent the connections the company has with other organizations. Organizations nested in a network can easily get access to other resources which is valuable in this market. Organizations do not have all the resources in-house since the energy-related market faces complete new technologies, products, and services. Finally, financial resources are also extremely valuable in the energy-related market because a lot of innovations take place. These innovations need to be financed, and thus financial resources play a vital role. Dunne (2009) argues that the more valuable resources the company owns the higher the resource richness of the company.

Combining the reasoning of Barney (1990) and Dunne (2009) it is expected that the higher the resource richness of the company, the less intense the resource dependency. The lower the resource richness, the stronger the resource dependency. This dependency gets stronger when the resources of the partner are defined as strategic resources. Table 6 illustrates the resource dependency based on the resource richness and existence of strategic resources.

Table 6 Resource dependency from resource richness and strategic resource perspective				
		Strategic resource		
		Both exchange strategic resource(s)	One company exchanges strategic resource(s)	No company exchange strategic resource(s)
Resource richness	High for both	Moderate(mutual dependence)	Low (disproportional)	No dependency (mutual dependence)
	High for one	Strong (power imbalance)	Moderate (disproportional)	Low (disproportional)
	Low for both	Very strong (mutual dependence)	Strong (disproportional)	Moderate (mutual dependence)

Source: Barney (1990), Dunne (2009).

Table 7 illustrates which organizational governance structure fits the best considering the resource dependency among involved actors. The reasoning behind the relation between resource dependency and organizational governance structure is derived from the Resource dependency theory (RDT). The stronger the resource dependency the more likely a hierarchical organizational governance structure will be implemented (Hillman, 2009). The reason to choose for a more hierarchical organizational governance structure is to reduce interdependency and to gain more value from the value that is created by strategic resources.

To analyze the degree of dependency, it is also necessary to analyze the value that the partner contributes to the overall value creation of the focal company (Workshop results). The higher the value contribution, the stronger the dependency. The ABC analysis can be used to classify the value of the resources according to their importance to the overall value creation. Based on the resource importance, the resources are categorized as A, B or C resources. A resources provide the highest value to the focal company. B resources contribute less high than A and C less than B.

**Table 7 Organizational governance structure from resource dependency perspective**

		Strategic resource		
		Both exchange strategic resource(s)	One company exchanges strategic resource(s)	No company exchange strategic resource(s)
<b>Resource richness</b>	High for both	Hybrid (hierarchical)	Hybrid (market)	Market
	High for one	Hierarchical	Hybrid (hierarchical)	Hybrid (market)
	Low for both	Hierarchical	Hierarchical	Hybrid (hierarchical)

Source: Dunne (2009) and Hillman (2009).

### 3.4. Theoretical compatibility

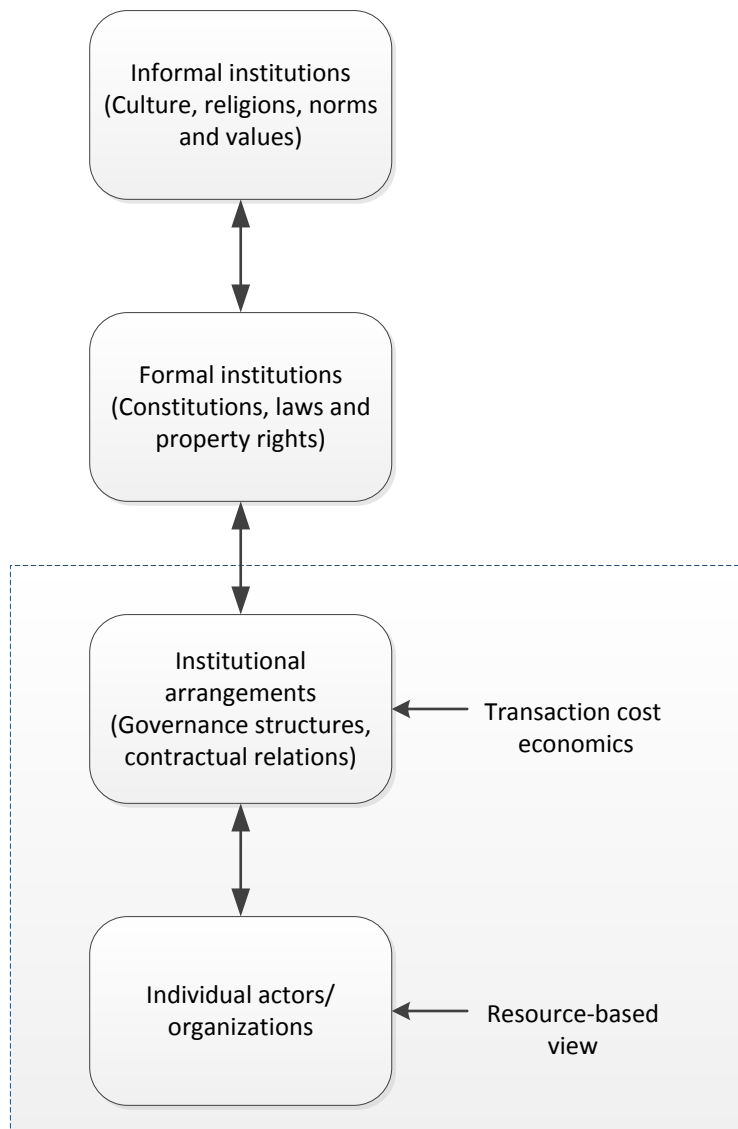
By comparing TCE and RBV, a better understanding is gained in how these theories complement each other. TCE and RBV are both economic theories. They are closely related and for that reason the differences and similarities between these theories are discussed in this paragraph.

TCE and RBV both have organizations as the unit of analysis but from a different perspective which is later explained. Another similarity are the assets and resources. Assets and resources can be viewed as equivalent and interchangeable (Watjatrakul, 2005). Some researchers argue that assets comprise resources, capabilities, and competencies and others argue that resources include assets, capabilities, knowledge, and organizational processes. Thus, assets and resources can be used synonymously. The reasoning behind choosing for a particular organizational governance structure is also common among these theories. Both TCE and RBV propose that hierarchical organizational governance structures are more likely to be appropriate when the activities and resources among the organizations overlap. If the activities and resources are too diverse and dissimilar, a less integrated organizational governance type is more likely to be appropriate. These similarities among TCE and RBV make it possible to combine these theories easily. Both focus on organizations and their assets/resources.

In spite of the similarities, there are differences among TCE and RBV. Both theories analyze organizations but in a different way. TCE is focused on the existence of organizations in the industry context, whereas RBV is focused on the differences among organizations caused by their resources. The dependent and independent variables differ among these theories. TCE describes the relations between transactions and governance structures whereas the RBV describes the relations between the resource, competitive advantage, and rent creation. The assets and resources are analyzed differently even though the assets and resources are interchangeable. TCE analyzes whether the assets are specific and RBV analyzes whether these are strategic. Specific and strategic are complete different aspects. The distinction between specific and strategic is that specific resources/assets are impossible to transfer from one company to another without any decrease in value and strategic resources/assets exploit opportunities and neutralize threats (Watjatrakul, 2005). Note that specific resources are not by definition strategic and vice versa. Finally, the scope of the theories differ. TCE

considers external factors, such as environmental uncertainties, whereas RBV only focuses on internal factors, the resources.

Based on the similarities and differences among TCE and RBV, it is concluded that they can complement each other when the focus of the analysis is to determine how organizational relationships should be managed and controlled. TCE and RBV complement each other because TCE underemphasizes the dynamics of capability developments and value-enhancing governance structures while RBV underemphasizes opportunism and exchange hazards which are present in organizational relationships as Donato (2010) argues.



**Figure 9 The four layer model of institutions**

resources, its characteristics, and the allocation of these resources in order to gain competitive advantage. As Künneke (2007) mentions, the fourth layer describes the allocation of resources for which the RBV is applicable.

With Williamsons' four layer model of institutions discussed by Groenewegen and Lemstra (2007), and Künneke and Fens (2007), it also becomes clear that TCE and RBV complement each other. TCE and RBV focus on different layers in the model of institutions, see Figure 9. Layer one refers to the informal institutions such as traditions, norms, and values. Layer two refers to the formal institutions such as law and regulations. The third layer refers to the institutional arrangements such as contracts and governance structures and the fourth layer is dedicated to the actors (Groenewegen, 2007; Künneke, 2007).

As mentioned in paragraph 3.2. TCE is dominant when it comes to governance structures. With the four layer model of institutions, on the one hand, and TCE, on the other hand, it becomes apparent that TCE is applicable to analyze the third layer. RBV is more concentrated on the company's

This four layer model does not only provide a clear overview of various institution layers it also illustrates the interactions among these layers. A change within one layer asks for adjustments in the other layers due to the interactions among the layers. By considering TCE and RBV the interaction and fit between the third and fourth layer is analyzed.

Even though TCE and RBV are both economic theories that are closely related, they complement each other when the focus of the analysis is to determine how organizational relationships should be governed. By applying TCE and RBV, the governance of organizational relationships is analyzed from an internal as well as an external perspective and also from a cost-efficiency as well as value creation perspective.

### 3.5. Measurement of theoretical constructs

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Paragraphs, 3.2,3.33.4 give a clear overview of the theories and how they complement each other. These theories are rather abstract theories which need to be operationalized before the theoretical constructs can be used to analyze practical cases. The operationalization is based on previous studies.

#### *Asset specificity*

For the operationalization of asset specificity, it is crucial to analyze whether the investments are specific for that particular organizational relationship. Either investments in employees to execute the activity that the organization contributes to the organizational relationship or investments in equipment to provide customized products for the partner.

#### *Uncertainties*

Environmental uncertainty is measured through the environmental uncertainties van de Vrande (2009) defines; environmental turbulence and technological newness. Environmental turbulence concerns the market, and technological newness concerns the product developments.

Behavioral uncertainty is measured through opportunistic behavior. Nooteboom (2004) divides opportunistic behavior in the opportunity to act opportunistic and the intention to act opportunistic. When the opportunity is there and the intentions are high, it is most likely that opportunistic behavior is present. The operationalization of opportunistic behavior is based on Nooteboom's (2004) reasoning.

#### *Resource dependency*

Resource dependency is measured through the resource richness and presence of strategic resources. To measure the resource richness the financial, commercial, technical and social resources are measured. Strategic resources are measured with the four resource attributes defined by Barney (1990).

Table 8 shows measurable constructs through which the theoretical constructs are measured in this research. For complete overview and in-depth explanation regarding the operationalization of the theoretical constructs see appendix A.



Table 8 Operationalization of theoretical constructs		
Theoretical construct		Measurement criteria
Asset specificity	Physical	Measurement criteria
	Human	Degree of product customization
	Brand-name capital	Investments in human capital in order to execute the activities for which it is responsible Tacit knowledge
	Site	Brand-name reputation of Vattenfall and partner Customer interface
	Temporal	Local coverage (through amount of branches)
Uncertainties	Dedicated	Maintenance management complexity
	Environmental	Specific investments for the organizational relationship
	Behavioral	Market maturity Degree of competition Product maturity Technology characteristics of the product Market complexity
Resource dependency	Resource richness	Company size of Vattenfall and partner Product complexity Strategy overlap among Vattenfall and partner Resource dependency Resource overlap among Vattenfall and partner resources
	Strategic resource	Technical resources Financial resources Commercial resources Social resources
		Valuable Rare Imitable Non-substitutable

### 3.6. Concluding remarks

Chapter 3 focuses on the theoretical constructs that provide insights in decision-making processes concerning organizational governance structures and for that reason the following sub-question stood central in this chapter: *Which theoretical constructs should be considered to analyze organizational governance structures?*

There are various theories and studies that provide insights in organizational governance structures and which aspect should be considered in order to determine which organizational governance structure fits the context in which it is embedded. TCE has emerged as a dominant theory in this

research field. TCE is extended with RBV in this research since various scholars criticized that decision-making processes concerning the choice of organizational governance structures should not just rest on costs but also on the resources the organizations owns, which is the domain of RBV. To strengthen the resource perspective is this research RBV is extended with the reasoning of RDT. This extension helped to define the preference for an organizational governance structure from a resource perspective.

Together, TCE and RBV provide a cost-efficiency as well as value creation perspective to the analysis. Important theoretical concepts of TCE and RBV are summarized in Table 9 and based on these it can be concluded that these theories complement each other.

Based on these theories important theoretical constructs of TCE and RBV are operationalized to a list of measurable criteria. These criteria are helpful to analyze cases in order to verify whether these theories are applicable.

Table 9 Summary of theoretical constructs		
	Transaction cost economics	Resource-based view
Domain of interest	The existence of organizations	The difference between organizations
Primary objective	Minimize transaction cost through cost-efficient governance structures	Increase the competitive advantage or performance of a organization through resources/capabilities
Focus of analysis	Transactional properties: asset specificity, uncertainties, and frequencies	Strategic resource attributes: valuable, rare, inimitable, and non-substitutable
Assumptions	Bounded rationality and opportunism	Resource heterogeneity and resource immobility

Source: Donato (2010) and Mclover (2009)

## 4. Empirical study

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*Gaining insights in practical cases is important and valuable for the design of the framework. For this study a case is defined as an inter- or intra-organizational relationship through which Vattenfall provides energy-related products and services to its customers. The unit of analysis is the organizational governance structure. Various cases are analyzed and two cases are analyzed in depth during this research.*

*First, this chapter discusses the case sampling, and the tactics to ensure the validity and reliability of the case study. Further, the case study protocol is described. The cases: the ‘E-manager – Greenwave’ case and the ‘Heat and ventilation systems – Feenstra’ case are in depth analyzed in this chapter. Subsequently, a cross case analysis is executed and this chapter ends with conclusions regarding the case study analysis and the theoretical applicability.*

### 4.1. Case sampling

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Over the previous years Vattenfall has entered into various organizational relationships with different partners within different sectors. Vattenfall provides various energy-related products and services to its customers through these organizational relationships. Each of these relationships is managed and controlled by a specific organizational governance structure.

For a relevant case study analysis it is important to select the cases deliberately. Each case should be challenging, representative, and add value to the research (Ragin, 1992). The case sampling is therefore based on the following six selection criteria:

- *Organizational governance structure:* Different organizational governance structures should be analyzed to gain a better understanding in motives behind different organizational governance structures.
- *Products and services:* Based on TCE it is expected that the characteristics of the products and/or services have an impact on the choice for a particular organizational governance structure (see Table 8 TCE measurement criteria).
- *Product/service complexity:* Product/service complexity depends on the degree to which the product/service is interconnected with other energy sector components such as the infrastructure, or components of other industries such as a chemical reactor. The higher the degree of interconnectedness, the more vulnerable the products and services are to changes of the components they are interconnected with, and the more complex the products and services are. It is expected that the complexity of the product/service influences the choice for an organizational governance structure. This reasoning comes from TCE where the environmental and behavioral uncertainty is measured inter alia with product complexity.
- *Product maturity:* This criterion is chosen because it is expected that the maturity of the product impacts the choice for an organizational governance structure. This reasoning comes also from TCE where the environmental uncertainties is measured through inter alia product maturity.
- *Partner for the organizational relationship:* The organizations that enter into organizational relationships negotiate how to structure the relationships. It is expected that the

characteristics of each partner and subsidiary have an impact on the decision-making process.

- *Customer interface*: The customer interface defines the degree of contact needed with the customer to make the product or service function. This criterion is selected because the customer interface might influence the choice for an organizational governance structure.

In addition to these criteria the accessibility of the information is a precondition for case selection.

The following two cases of organization-relationships by Vattenfall are selected:

- *Case 1: E-manager – Greenwave*. This case concerns the inter-organizational relationship between Vattenfall and Greenwave through which Vattenfall provides E-managers to its Dutch customers (households). The E-manager is a hard/software that visualize the energy consumption of the customers.
- *Case 2: Heat and ventilation applications – Feenstra*. This case concerns the intra-organizational relationship between Vattenfall and Feenstra through which Vattenfall provides heat and ventilation applications to Dutch customers.

Both cases differ in various aspects, see Table 10.

Table 10 Characteristics of the selected cases		
	Case 1	Case 2
Organizational governance structure	Hybrid	Hierarchical
Product and service	E-manager	Heat and ventilation applications, and maintenance and reparation services
Product complexity	Moderate	Low
Product maturity	Immature	Developed
Partner	Greenwave (External – start-up)	Feenstra (Subsidiary)
Customer interface	Vattenfall	Shared (Feenstra has a stronger customer interface than Vattenfall)

These two cases are chosen because they differ on all the selection criteria. By choosing complete different cases it becomes possible to control whether the expectation are covered in total different cases. If that is the case, it is possible to conclude that the expectations are right in any circumstances.

#### 4.2. Case study validity and reliability

Yin (2003) describes four tests that are useful to judge the quality of case studies. These tests are: construct validity, internal validity, external validity, and reliability. There are various tactics for dealing with these tests. Table 11 presents the case study tactics with a brief description of how they are implemented in this research to ensure validity and reliability.

**Table 11 Case study validity and reliability**

Test	Tactics	Implementation in cases
Construct validity	Use multiple sources of evidence Establish a chain of evidence Let key informants review draft report	Execute various interviews and gathered multiple documents to triangulate data Report checked regularly by key informants and other members during the research
Internal validity	Do pattern –matching Do explanation-building Address rival explanations Use logic model	Investigate patterns across the case studies / cross-case study analysis TCE and RBV are used as logic model
External validity	Multiple case studies Replication logic	Analyze different energy-related projects (Replication logic is not considered due to limited time)
Reliability	Use of case study protocol Develop data base for case study evidence	Create case study protocol Create data base

#### 4.3. Case study protocol and report pattern

A case study protocol is constructed to structure the case study analysis. The case study protocol is illustrated in Figure 10. Below the steps of the case study protocol are described.

*List of theoretical constructs:* The list of theoretical constructs, discussed in chapter 3, is used to determine which data needs to be collected.

*Determine data collection procedure:* The data is collected through various resources, such as semi-structured interviews, press releases, company documents, and homepages from organizations.

For the semi-structured interviews various employees of Vattenfall are interviewed. The interview protocol is included in appendix B. Each interview is analyzed and interviewees reviewed the case reports. The following three questions are asked during the review of the reports:

1. Is the report of the case correct?
2. Does the report emphasize the right issues?
3. Are there missing issues which were not mentioned during the interviews but which are nevertheless relevant?

*Data analysis:* A within case study analysis and a cross case analysis are conducted after data is collected and analyzed.

Paragraphs 4.4. and 4.5. describe the case1: E-manager – Greenwave and the case 2: Heat and ventilation applications – Feenstra in detail .

Each case is analyzed along a case report pattern. First background information is given regarding the market, the product and service, the partner and the activities that are divided among Vattenfall, the partner, and subsidiary.

Second, the organizational governance structure that is implemented is discussed.

Third, the theoretical constructs of TCE and RBV are discussed in order to gain insights whether the implemented organizational governance structure is in accordance to theoretical predictions.

From the theoretical constructs of TCE and RBV, asset specificity and resource dependency are measured from both Vattenfall and the partner perspectives.

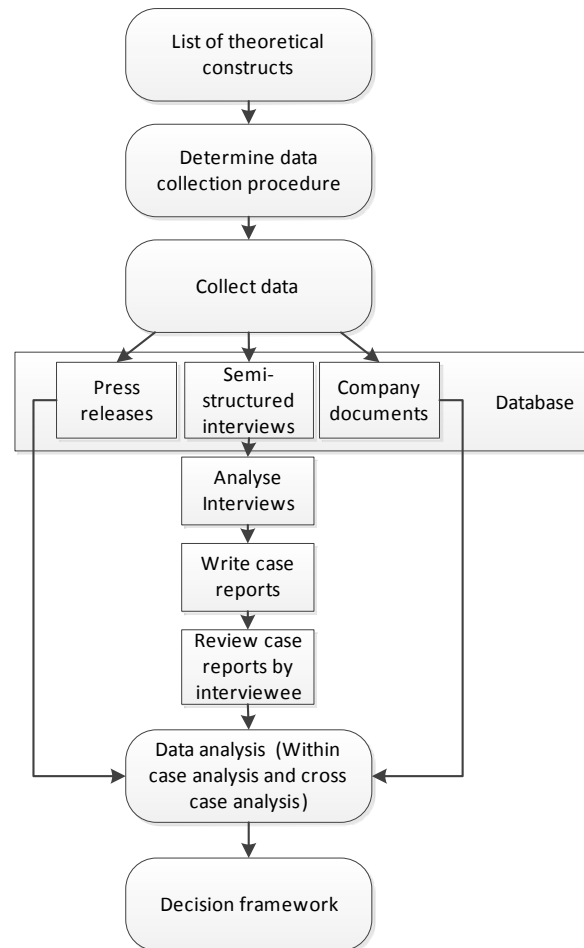
The environmental uncertainty is not measured from both Vattenfall and partner perspective, as it is expected that the impact of environmental uncertainties do not differ between Vattenfall and the partner. Only the way the environmental uncertainty is perceived might differ. To determine the difference in environmental uncertainty perception the size of Vattenfall and the partner are considered and also the activities they are responsible for. For example, if an environmental uncertainty impacts mainly the activities of the partner Vattenfall does not perceive the environmental uncertainty as threatening as the partner perceives it.

The behavioral uncertainty is also not measured from both perspectives because the research objective is to design a support tool for Vattenfall and not for the partner.

Fourth, the organizational governance structure implemented is discussed. At last, whether the structure is in accordance to the predictions of TCE and RBV.

#### *Decision framework*

The insights gained through the theoretical discussion, the collected data and the case study analysis are used as input for the framework design which is discussed in chapter 6.



**Figure 10 Case study protocol**

#### 4.4. Case 1 E-manager – Greenwave

Vattenfall introduced the E-manager on the Dutch energy market in 2011 through the inter-organizational relationship with Greenwave. The E-manager provides real-time information on energy consumption through which customers can save money on their energy bills by monitoring their energy consumption. With smart plugs, which are connected to household-equipment's and the E-manager, customers can monitor their electrical equipment from a distance (Nuon, 2012).

##### 4.4.1. Home energy management market

The home energy management market is expected to be directed by the introduction of smart meters and demand-response programs. The smart meter developments are driven by European legislation and regulation such as the Energy Service Directive (2006/32/ED, ESD) and the Directive on the internal electricity market (2009/72/EC). The legislative push by the EU makes the smart meter market dynamic. Member states adjust their energy legislation constantly in order to comply with the European legislation (Renner, 2011). The smart meter is currently in the end of a two year pilot phase in the Netherlands.

The developments with regard to the smart meter influence the development of home energy management since the products need to be compatible. But it is expected that the influences remain poor due to the expectation that only a limited number of households will install the smart meter in the near future. The installation of the smart meter is not obligatory in the Netherlands. Customers have the right to choose for smart meters or not (Renner, 2011) and based on this it is expected that the smart meter developments have no significant impact on the developments of the home energy management system<sup>2</sup>

Despite of the little influence of the smart meter market, the home energy management market is dynamic. This dynamic market is reflected by the large number of organizations that are active in this market, from start-ups such as Greenwave and Onzo to large well-known organizations such as Cisco and Honeywell. These organizations are all competing for a share of the market with their home energy management systems<sup>2,3</sup>. The home energy management market is still immature, as a lot of innovations are taking place in this market. As Delta Energy & Environment states (2011) *“There is little clarity among the great majority of industry players,....., around how exactly the market will develop, and what the end points will look like.”* (Delta, 2011)

The home energy management market is rather driven through technology push than demand push<sup>3</sup>. Figure 11 indicates that the adoption of home energy management systems is low. The home energy management market has not reached the mass-market yet, as Figure 11 illustrates. *“In*

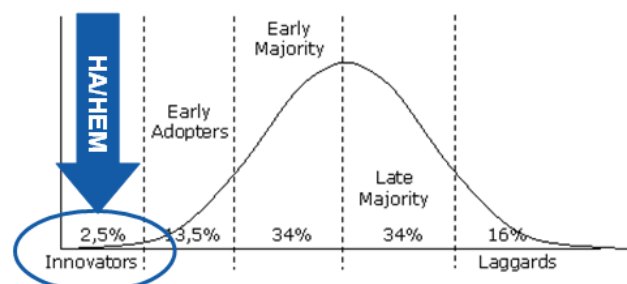


Figure 11 E-manager adoption

<sup>2</sup> Employee from Product development – E-manager, 2012

<sup>3</sup> Company report from product development – E-manager, 2012.

*order for the market to reach mass-market potential many hurdles must be overcome to make solutions attractive, affordable and easy-to-use”<sup>3</sup>*

#### 4.4.2. E-manager and services

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Home energy management systems are high-tech and complicated systems. The hardware and software ask for specialized IT knowledge. But the product is technically not complex even though it should be compatible with other energy components such as the smart meter. The underlying reason is that the E-manager is not intensively vulnerable for the developments of the other energy components which reduces the product complexity<sup>4</sup>

The E-manager which Vattenfall launches on the Dutch market through the inter-organizational relationship with Greenwave is standard from the end-customer perspective. There is no distinction made between various customers. But it cannot be concluded that the E-manager is a complete standard product. The E-manager is customized to a certain extent to Vattenfall's desires. The platform Greenwave designed was not compatible for the Dutch market because the platform of Greenwave lacked some features that are specific for the Dutch market, such as gas features. Secondly, Vattenfall imposed some standards that it wants to be covered by the E-manager<sup>4</sup>.

The E-manager is a product that does not need extensive maintenance and reparation services. In addition, the maintenance and reparation are in general not urgent as there are no high consequences when the product is out of running for a couple of days. Based on this it can be concluded that the maintenance and reparation service management are not complex and not labor intensive compared to products that need to be maintained and repaired frequently to guarantee continuous operation.

#### 4.4.3. Partner – Greenwave

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Vattenfall selected Greenwave through a vendor selection in 2011 to cooperate with for the development and marketing of the E-manager. For the vendor selection a list of criteria was established and based on these criteria various organizations were compared. Time to the market, the functionality of the E-manager in the Dutch energy market and some technical requirements are criteria that were considered during the tendering. Based on these criteria Greenwave was selected.

Greenwave is a global innovator in the Smart Home Services market and was founded in 2008 by experienced employees coming from Cisco, from Silicon Valley (Greenwavereality2, 2012). The main office is established in the United States of America.

The fact that Greenwave is a start-up company made it an interesting party to cooperate with because large and well-known organizations are considered too bureaucratic, slow and expensive<sup>4</sup>. There can also be a downside related to start-ups, the start-up risk on which will be elaborated later on.

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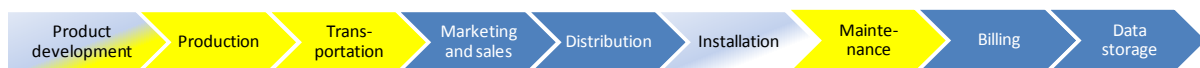
<sup>4</sup> Employee from Product development – E-manager, 2012



Furthermore, the product portfolio of Greenwave makes it an interesting partner. Greenwave's product portfolio consists of the Energy Management, Connected Lighting, and Home Monitoring Services (Greenwavereality2, 2012). These products can also become interesting for Vattenfall in the future for business expansion possibilities.

#### 4.4.4. Division of Labor

To gain better understanding regarding the cooperation it is necessary to analyze the activities along which the E-manager is produced and launched on the market. Figure 12 illustrates the activities and how these are divided among Vattenfall and Greenwave.



**Figure 12 Supply chain of the inter-organizational relationship between Vattenfall and Greenwave**

Vattenfall is responsible for the blue colored activities: product development, marketing, distribution, installation, billing and data storage. Data storage is needed because with the E-manager data concerning the energy consumption of the customers is collected.

The installation activity is slightly blue colored, because the installation of the E-manager does not require expertise and for that reason customers can choose to install the E-manager by themselves with aid of an installation video from Vattenfall. But customers can also choose to let the E-manager be installed by Vattenfall (Nuon beveiliging). Based on this it can be concluded that the installation of the E-manager is not labor intensive.

Greenwave is responsible for the yellow colored activities: product development, production and transportation, and maintenance and reparation services<sup>5</sup>.

#### 4.4.5. Inter-organizational governance structure

The organizational relationship is between two private organizations and for that reason the relationship is managed and controlled through an inter-organizational governance structure and not through an intra-organizational governance structure. Based on observations, it is concluded that the relationship with Greenwave is managed and controlled through a non-equity alliance. As an employee of the Product Department explained the relationship is not managed and controlled through a simple buyer-supplier contract. At the start of the inter-organizational relationship the product was not yet fully developed, and as a consequence both organizations needed to collaborate for the product development. A hierarchical inter-organizational governance structure is also not implemented. Both Vattenfall and Greenwave had no incentive to manage and control the relationship through a hierarchical structure such as a merger, acquisition, joint venture or any relationship where equity is involved. The home energy management market is immature and a lot of innovation still takes place. In order not to hamper product innovation Vattenfall decided not to own and dominate Greenwave. By not owning Greenwave, Vattenfall wants to give Greenwave room

<sup>5</sup> Employee of Product development – E-manager, 2012

to innovate. From Greenwave's perspective there was also no need to have a hierarchical structure. From a financial perspective Greenwave can operate independently from Vattenfall<sup>5</sup>.

Since Greenwave is a start-up there is always the risk that Greenwave goes bankrupt which can lead to loss of resources. To prevent that the E-manager cannot function when Greenwave goes bankrupt an agreement is covered in the organizational governance structure.

Another risk mentioned during the interviews is, the risk that Greenwave provides its knowledge, which it gained through the collaboration, to competitors. To prevent that competitors can benefit from Greenwave and the knowledge they gained during the collaboration, an agreement is covered in the organizational governance structure.

Furthermore, there are database agreements to protect the data that is collected through the energy consumption of customers.

#### 4.4.6. Theoretical constructs of TCE and RBV

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With the clear overview of the market, product, the partner Greenwave, the activities that are executed, and the organizational governance structure it now comes to the analysis of the case with the theoretical constructs of TCE and RBV. Each construct is discussed in the following paragraphs.

##### 4.4.6.1. Uncertainties

The home energy management market is immature as mentioned in paragraph 4.4.1. A dominant home energy management system has not surfaced and the development of the home energy management system is still uncertain. Organizations from start-ups (such as Greenwave) to well-established organizations (such as Cisco) are competing to develop the dominant home energy management system. Other energy companies and even grid operators are also actively developing home energy management systems. It is uncertain how the product will develop and whether the home energy management system developed by Vattenfall and Greenwave will become one of the dominant systems in the market. In addition, demand developments are also uncertain. Thus, the organizational relationship between Vattenfall and Greenwave faces high product, as well as demand uncertainties.

Compared to the environmental uncertainties the behavioral uncertainties are low to moderate. This is based on the relative small size of Greenwave, low product complexity, lack of resource overlap, and similar strategies of Vattenfall and Greenwave.

Greenwave is a small organization in comparison to Vattenfall based on the fact that it is a start-up. Because Greenwave is smaller in size than Vattenfall, Greenwave does not have greater bargaining power which can give Greenwave the room for opportunistic behavior. Thus, opportunity for opportunisms by Greenwave is low.

The product complexity is low because the interface between the E-manager and other energy components is not complex, because other home energy management systems can be connected to

those components. The opportunity to act opportunistic is ranked low, based on the relative small size of Greenwave and the absence of product complexity.

However, the opportunity to act opportunistic is not low ranked in the end because there is no resource overlap. The scale and scope of the resources of Vattenfall and Greenwave differ, and based on that, it is concluded that there is no resource overlap. This lack of resource overlap comes with information asymmetry which makes it difficult to monitor Greenwave. This difficulty in monitoring and controlling gives room for opportunistic behavior. Based on that, the total opportunity for opportunistic behavior is ranked moderate based on the described findings.

The intention towards opportunistic behavior is low. Vattenfall and Greenwave both want the E-manager to succeed and sell volumes <sup>6</sup>. The strategies of Vattenfall and Greenwave are not difficult to align for that reason. Besides, both mutually depend on each other, which is in detail explained in paragraph 4.4.6.3.

As the opportunity for opportunism is moderate and the intention to act opportunistic is low the total behavioral uncertainty is low to moderate.

Summarized, the environmental uncertainties are high for both Vattenfall and Greenwave. Both are committed to the development of the product. Both perceive the threat caused by these uncertainties. The behavioral uncertainties are low to moderate. To conclude, the total uncertainty is defined as moderate.

#### 4.4.6.2. Asset specificity

##### *Vattenfall's perspective*

From Vattenfall's perspective the total asset specificity is low to moderate. There are six types of asset specificity as mentioned in paragraph 3.2. From these six types four are applicable in this case namely the physical, human, dedicated asset specificity, and brand-name capital.

The physical asset specificity is low. There are no physical assets dedicated to the relationship in order to co-develop and commercialize the E-manager.

The human asset specificity is moderate. The employees of the sales department are not only dedicated to the sales of the E-manager. These employees are also responsible for the sales of other products and services. Besides the sales employees, it is also important to analyze the project team members which are dedicated to the management and control of the relationship. The knowledge of Greenwave's employees is defined as tacit. Because of the tacit knowledge, it is assumed that Vattenfall needs to invest in its employees for the sole purpose of managing the organizational relationship. The employees of Vattenfall have to gain knowledge regarding the product and market in order to have the ability to manage the organizational relationship properly.

Dedicated asset specificity is also moderate from Vattenfall's perspective because Vattenfall partly finances the development of the E-manager but not all the developments.

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<sup>6</sup> Employee of Product Development – E-manager, 2012

Brand-name capital is low based on the following reasoning. Nuon has a strong brand-name reputation in the Netherlands. In overall, customers are positive about Nuon<sup>7</sup>. The brand-name reputation of Greenwave is expected to be moderate. It is a start-up company, and based on that it is concluded that Greenwave did not built a strong reputation yet. The reputation is not ranked low because it is expected that Greenwave receives a strong reputation, for the reason that, it is established by highly skilled and experienced investors. Furthermore, Vattenfall has the customer interface in this organizational relationship. There is no need for costly measures to safeguard Vattenfall's brand-name reputation, and therefore, the brand-name capital is low from Vattenfall's perspective.

#### *Greenwave's perspective*

From Greenwave's perspective the physical, human, temporal, dedicated asset specificity, and brand-name capital are of great concern.

The physical asset specificity is moderate for Greenwave. As mentioned the E-manager needed to undergo some changes to fit in the Dutch energy market and meet the feature preferences of Vattenfall. To adjust the existing platform it is assumed that investments were needed to develop physical assets in order to adjust the product. It is ranked moderate and not high because it is assumed that the assets for the adjustments are not specific. These non-specific adjustments can be used in other markets.

Compared to Vattenfall the human asset specificity is high. The knowledge within Greenwave is defined as tacit in this research. The employees are highly experienced and come from the Silicon Valley and for that reason their knowledge is identified as tacit. Greenwave uses this tacit knowledge for producing a home energy system that fits in the Dutch market and meets the feature preferences of Vattenfall. Because Greenwave needs to develop knowledge that is specific for the Dutch energy market and for Vattenfall's expectations, it is expected that Greenwave invests in training its employees to execute the activities it is responsible for. Based on that, the human asset specificity is high

Temporal asset specificity is low, because the product does not request complex maintenance. Neither is there urgency for reparation when the product is not functioning.

Since both organizations invest in the developments of the E-manager the dedicated asset specificity is also ranked moderate. Greenwave only finances development it can use for other markets, and for that reason the dedicated asset specificity is not high. Asset specificity is not ranked low because Greenwave probably needs to make some investments to adjust the product, which are valuable to meet the preferences of other clients.

Brand-name capital is low. Greenwave is a start-up and it is expected that it has a strong brand-name reputation. However this reputation can be stronger because it is assumed that Greenwave did not have the time to build a well-known brand yet because. For Greenwave it is important that its brand-name reputation gets stronger, and therefore it is vulnerable for the fact that Vattenfall has

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<sup>7</sup> Employee of business development, 2012

the customer interface. The brand-name capital is ranked low even though building a strong brand-name reputation is important and the fact that Greenwave does not have the customer interface. The underlying argument is the brand-name reputation of Vattenfall. Because Vattenfall has the customer interface it is not motivated to damage the customer interface because its own brand-name reputation is than at stake. Thus, there is no need for Greenwave to invest a lot control mechanisms to safeguard its brand-name reputation.

Based on these findings, it can be concluded that the asset specificity is not high from both Vattenfall's and Greenwave's perspectives. From Vattenfall's perspective the asset specificity is low to moderate. None of the four types of asset specificity that are of great concern for Vattenfall score high. They all score low or moderate and for that reason the total asset specificity from Vattenfall's perspective is ranked low to moderate. From Greenwave's perspective the total asset specificity is moderate. Greenwave is concerned with higher physical and human asset specificity than Vattenfall.

#### 4.4.6.3. Resource dependency

As mentioned in paragraph 3.3 the resource dependency depends on the resource richness of Vattenfall and Greenwave and whether the resources in exchange can be defined as a strategic resources.

##### *Technical resources*

Both Vattenfall and Greenwave are responsible for the development of the product but differ in their contribution. Vattenfall contributes its technical knowledge regarding the energy market and more specific the Dutch energy market. With this knowledge Vattenfall defines the design requirements which the E-manager should cover to fit to the Dutch energy market. In addition, Vattenfall is also involved in the development of the layout of the E-manager, such as how the features should be presented to the customers. Greenwave's contribution to the development of the E-manager is its technical knowledge regarding IT, software and hardware technologies<sup>8</sup>.

Thus, both organizations provide technical resources for the development of the product. However, there is a distinction between the technical resources of Vattenfall and Greenwave. In this research the technical resources of Greenwave are identified as strategic resources, whereas the technical knowledge of Vattenfall is not. Greenwave's technical knowledge is considered strategic, based on the scarcity of the players in the home energy management market and the tacit character of Greenwave's technical knowledge.

##### *Commercial resources*

For the marketing which falls under the responsibility of Vattenfall the client database is a valuable resource. The client database contains the clients that have a contract with Vattenfall for their commodities such as electricity, gas, and heat. This client database provides an overview of potential clients for the E-manager, and therefore Vattenfall can perform the marketing more easily than Greenwave.

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<sup>8</sup> Employee of product development - E-manager, 2012

The client database for the E-manager can be defined as a strategic resource, because the home energy management market is new. There are not many organizations that have a database similar to it and there is not so much data concerning the energy consumption of clients available yet.

The client database for commodities, which gives Vattenfall the ability to market the E-manager, cannot be defined as strategic. Other utilities can provide the same data. Based on this, it is concluded that Greenwave depends on the commercial resources of Vattenfall to sell the E-manager on the Dutch market and gain access to the energy consumption behavior of clients.

#### *Financial resources*

As described in paragraph 4.4.5 Greenwave is financially independent from Vattenfall. Even though Greenwave is not financially dependent it does not mean that there are no financial resources involved in this relationship. Vattenfall partly finances the developments of the E-manager. Developments that are typical for Vattenfall are financed by Vattenfall. Other developments which are also interesting for other markets are financed by either both Vattenfall and Greenwave or only Greenwave<sup>9</sup>

#### *Social resources*

Both Vattenfall and Greenwave have relationships with other organizations. Vattenfall has many other inter-organizational relationships through which it provides other products and services. But Vattenfall cannot commercialize the E-manager with the other organizations completely, and therefore it remains dependent on Greenwave to commercialize the E-manager successfully. Greenwave also has inter-organizational relationships with other organizations but Vattenfall is one of the biggest utilities with who it collaborates<sup>8</sup>. Since Vattenfall is one of the biggest utilities the social resources of Greenwave do not limit the resource dependency from Greenwave's perspective. Based on this, it is concluded that the social resources of Vattenfall and Greenwave do not limit the resource dependency that is created by the other resources that are exchanged.

Summarized, both organizations are rich of resources. However, Vattenfall and Greenwave are still dependent on each other regarding the resources for the development of the E-manager, because some resources they exchange are strategic and valuable for the other. For example, Vattenfall's client database is valuable for Greenwave, and the technical resources of Greenwave are valuable for Vattenfall.

#### 4.4.7. Practice versus theory

Table 12 summarizes the case. The choice for the hybrid financial structure is almost in accordance to the TCE reasoning. For both organizations the total asset specificity is moderate. The uncertainties are moderate to high. Based on moderate to high uncertainties and moderate asset specificity for both the organizational governance structure should be an hybrid structure with hierarchical characteristics according to the TCE reasoning, see Table 5.

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<sup>9</sup> Employee of product development – E-manager, 2012

From a RBV perspective it can be concluded that the choice for a hybrid organizational governance structure is also almost in accordance to the RBV reasoning. Theory implies that the organizational governance structure should be a hybrid structure with hierarchical characteristics due to the mutual resource dependency and presence of strategic resource, see Table 6. Thus it would be logic that Vattenfall had chosen to control Greenwave's strategic technical knowledge and capabilities through an organizational governance structure with hierarchical characteristics, such as an equity alliance, from a RBV perspective.

As the above results illustrate, TCE and RBV predict the same organizational governance structure, namely the hybrid organizational governance structure with hierarchical characteristics. However, the organizational relationship between Vattenfall and Greenwave managed and controlled through a non-equity alliance and not an equity alliance. This difference between theory and practice can be explained by the factor trust. The transaction risk department ranked the risks high for the project with Greenwave but as an employee of product development department explains did it trust in the competence of Greenwave to make successful product, and therefore, willing to take the risks. This trust may also be an explainable reason why Vattenfall had chosen for non-equity alliance instead of an equity alliance. Chapter 5 explains the impact of trust on the choice for an organizational governance structure more profoundly.

Table 12 Summary case 1: E-manager - Greenwave

A. General overview							
Market			The home energy management system market is an immature market. It is related to the smart meter market but it is not intensively vulnerable to changes in the smart meter market.				
Product & service			Immature product and service. No dominant home energy system on the market yet, and as a consequence that there are product uncertainties. Lower complexity of the product and service, as the product has low interconnectedness with other energy components.				
Partner			Start-up company established in the United States of America in 2008. Founders and employees come from Silicon Valley and are well experienced employees. Based on the fact that the product is new and the employees are well experienced in the IT world, it is expected that their knowledge is tacit and strategic.				
Division of labor			The collaboration concerns the process of the development of the product to sales. Vattenfall's main responsibility is the marketing and sales, whereas Greenwave is mainly responsible for the development and production. It should be acknowledged that Vattenfall also contributes to the product development. With its knowledge regarding the energy market Vattenfall sets up design requirements.				
B. Organizational governance structure (OGS)							
Implem ented OGS	Financial structure		Hierarchical (Acquisition)	Hybrid (Equity)	Hybrid (Non-equity)	Market (Buyer-Supplier contract)	
	Control mechanisms	Output			An agreement		
		Process			An agreement		
		Social			Regularly meetings		
C. Theoretical constructs TCE and RBV							
Environmental uncertainty	Low	Moderate	High	Total uncertainty	Moderate to high		
Behavioral uncertainty	Low	Moderate	High				
From Vattenfall's perspective				From Greenwave's perspective			
Asset specificity	Low	Moderate	High	Asset specificity	Low	Moderate	High
Resource dependency	Low	Moderate	Strong	Resource dependency	Low	Moderate	Strong
D. Alignment between implemented OGS and OGS pre-described by TCE and RBV							
OGS from TCE perspective			Hierarchical	Hybrid (hierarchical)	Hybrid (market)	Market	
OGS from RBV perspective			Hierarchical	Hybrid (hierarchical)	Hybrid (market)	Market	



#### 4.5. Case 2 Heat and ventilation applications – Feenstra

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This case concerns the collaboration between Vattenfall and the installation company Feenstra Verwarming B.V. (hereafter: Feenstra). Through this collaboration Vattenfall provides ventilation-, central heating applications and various services such as installation, maintenance, and reparation to Dutch customers. In addition, Feenstra gives Dutch customers advice regarding heating, warm water, and ventilation.

In the following paragraphs 4.5.1 to 4.5.7 the organizational governance structure, that is currently in place, is analyzed and examined based on the TCE and RBV.

##### 4.5.1. Installation market

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The installation market is a mature market. The market is marked by the absence of significant growth and innovation and there are many organizations competing in this market.

Feenstra's business is vulnerable for the developments on the Dutch housing market. When the developments on the housing market stagnate, the demand for ventilation and heat applications decreases as well. The Dutch housing market has stagnated over the past years (TNO, 2011). Fewer permits for new housing developments are provided and as a consequence less houses are built than in previous years. Underlying reasons for providing fewer permits are: rise of unemployment, decrease of the prices of the houses, and the stricter rules for banks regarding mortgage lending. These forces together make it harder to buy houses.

TNO (2011) suspects the Dutch housing market will raise moderately starting from 2013. In addition to the stagnation, the amount of money spent on house maintenance also decreased due to the economic crisis (TNO, 2011). Both, the stagnation in the housing market and less money spent on house maintenance, have a negative influence on the demand for ventilation-, heat applications and services.

The installation market is not complex. The installation market is vulnerable for the developments on the housing market but the effect is only limited to the demand for heat and ventilation applications. The developments in the housing market do not affect the product developments significantly.

##### 4.5.2. Heat and ventilation applications

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The heating and ventilation applications can be characterized as mature products; they are not under development. Neither are these applications high tech or unique. Various ventilation and heat applications are provided by different brands which results in a wide variety of applications from which customers can choose.

The heat and ventilation applications are not complex. The ventilation- and heat applications are hardly or not at all directly interconnected with other components and are not vulnerable for changes of the components they are interconnected with. Furthermore, the applications are almost completely standard. To a certain extent the ventilation- and heating applications are customized but

mostly are standard applications. Thus, heat and ventilation applications are rather simple and straight forward than complex.

The installation and maintenance services of ventilation- and heat applications are processes that are not complex, but the urgency behind the reparation services makes the preparation management complex. Feenstra should be capable to provide preparation services as soon as possible. Heat is a basic need and a delay of many hours in the preparation of a broken heating applications in a winter period can have consequences.

To summarize, the ventilation-, central heating applications, and related services are in general rather standard and simple than complex and complicated.

#### 4.5.3. Partner Feenstra

Feenstra was established in 1947 and expanded itself rapidly. The reason for Vattenfall to select Feenstra for the collaboration for the ventilation-, central heating applications was that Feenstra distinguished itself from its competitors with its sustainable knowledge, its great logistic planning and its product development. Furthermore, Feenstra had and still has a strong position on the Dutch market. It has a wide geographical spread in the Dutch market and owns around 20 branches<sup>10</sup>. These 20 branches give Feenstra the ability to provide services to many customers across the Netherlands

In this research no information is received regarding the selection procedure for the collaboration between Vattenfall en Feenstra, due to the fact that the employees involved in the selection procedure are currently not employed at Nuon/Feenstra anymore.

#### 4.5.4. Division of labor



**Figure 13 Value chain of the intra-organizational relationship between Vattenfall and Feenstra**

The grey activities illustrated in Figure 13 are beyond the scope of this research because other external organizations are responsible for these activities. Figure 14 gives a better overview of the responsibilities of Vattenfall and its subsidiary Feenstra.



**Figure 14 Responsibility divided over Vattenfall and Feenstra**

The blue activity ‘marketing and sales’ as illustrated in the supply chain falls under the responsibility of Vattenfall because Vattenfall has a well-developed sales department, client database and strong brand-name. The yellow colored activities: distribution, installation, maintenance, including

<sup>10</sup> Employee of Feenstra , 2012

reparation, and billing of the ventilation- and heating systems<sup>11</sup>, fall under the responsibility of the subsidiary Feenstra.

#### 4.5.5. Intra-organizational governance structure

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The cooperation between Vattenfall's sales department and Feenstra is managed and controlled by a hierarchical organizational governance structure. Nuon has acquired Feenstra in 2001. During that time the acquisition of Feenstra was in line with the strategy of Nuon. By taking Feenstra over Nuon could carry out its strategy to broaden its product portfolio to provide more products and services to its customers and build a stronger customer relationship at the same time. With this acquisition Nuon could show the market that they were acting in line with the formulated strategy<sup>12</sup>

The acquisition of Feenstra has benefitted both Nuon and Feenstra. For both organizations the customer portfolio got expanded by the acquisition. Feenstra's core customers were Housing Corporations and Nuon's core customers were households. Through the cooperation between Nuon and Feenstra both the housing corporations and households could be served. Thus, this acquisition lead to an expansion in customer portfolio and strengthened the market position of both organizations.

Even though Nuon became a complete owner of Feenstra, it did not exercise control or joint control upon the operations and financial policy of Feenstra (Nuon, 2011). Neither has Nuon changed the brand-name of Feenstra. Based on this, it is concluded that Feenstra operated on its own almost as an independent company.

The cooperation between Vattenfall's sales department and Feenstra requires coordination and monitoring. Yearly a Service Level Agreement (SLA) is drafted. Vattenfall and Feenstra yearly determine the parameters of the SLA, such as sales, lead targets, budgets, together. To cope with uncertainties the SLA is renegotiated each quarter<sup>13</sup>.

#### 4.5.6. Theoretical constructs of TCE and RBV

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With the clear overview of the market, the product, the partner Feenstra, and the activities Vattenfall and Feenstra execute, the case is analyzed and compared to the theoretical constructs of TCE and RBV. Each construct is discussed in the following paragraphs 4.5.6.1. to 4.5.6.3.

##### 4.5.6.1. Uncertainties

The intra-organizational relationship between Vattenfall and Feenstra does not face high environmental uncertainties.

There are no drastic developments within the installation market. The absence of drastic developments indicates that the market is mature which decreases the uncertainties in the market. In addition, the market is not complex. The housing market only influences the demand volume for

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<sup>11</sup> Employee of Feenstra, 2012

<sup>12</sup> Employee of Product solutions, 2012

<sup>13</sup> Employee of chain management Feenstra, 2012

ventilation- and heat systems. Thus, there are no drastic uncertainties related to the development of the installation market and the product and based on that the environmental uncertainty is ranked low.

Even though Feenstra can be considered as a large company with above 20 branches and around 1500 employees, compared to Vattenfall it is a relatively small company. Thus, the bargaining power of Feenstra is not greater. The product complexity is low, given that the heat and ventilation application are not interconnected to many other energy components. The resources of Vattenfall and Feenstra do not overlap which makes it more difficult for Vattenfall to control Feenstra, than when there is a higher resource overlap. However, as the activities Feenstra executes are not complicated to understand, the difficulty for monitoring the partners' compliance is low.

The relative small size of Feenstra, the absence of product complexity, and the difficulty to monitor the partners' compliance lowers the opportunity for Feenstra to act opportunistic.

The intention to act opportunistic is not low but rather moderate, on the other side. The strategies of Feenstra and Vattenfall do not always overlap and it is difficult to align these. The resource dependency among Feenstra and Vattenfall has increased over time from Feenstra's perspective as will be explained in paragraph 4.5.6.3. in detail. This dependency decreases the intention from Feenstra perspective to act opportunistic.

With the high difficulties to align the incentives and the high resource dependency from Feenstra's perspective the intentions for Feenstra to act opportunistic is moderate.

The overall behavioral uncertainty is ranked low to moderate.

#### 4.5.6.2. Asset specificity

##### *Vattenfall's perspective*

The physical, human asset specificity, and brand-name capital are important considerations from Vattenfall's perspective. These three types of asset specificity are ranked low from Vattenfall's perspective.

The physical asset specificity is low because Vattenfall does not dedicate physical assets especially for the heat and ventilation products and services. Vattenfall shares their commercial resources, they are also used for other products.

The human asset specificity is also ranked low because the commercial knowledge of Vattenfall's employees is not specifically dedicated to the organizational relationship. Besides, there is no need to invest in training session to train employees specifically to support the commercial activities and manage the organizational relationship with Feenstra. The knowledge of the employees of Feenstra is not considered tacit knowledge. Therefore, there is no need for Vattenfall employees to gain a lot of knowledge regarding the activities of Feenstra.

In this organizational relationship there is no need for high brand-name capital. Nuon has a strong brand-name reputation within the Netherlands. Overall customers are positive about Nuon<sup>14</sup>. Nuon did not change the brand-name and based on that it is assumed in this research that Feenstra has also a strong brand-name reputation. Both organizations have the customer interface. Vattenfall during the advertisement and Feenstra during the installation, maintenance, and reparation services. Since both have a great brand-name reputation and customer interface it is concluded that there is no need for high investments in measures to safeguard their brand-names.

#### *Feenstra's perspective*

From the perspective of Feenstra the physical asset specificity, human asset specificity, site asset specificity, and brand-name capital are ranked low. The temporal asset specificity is ranked high.

From Feenstra's perspective the physical asset specificity is low. The heat and ventilation applications are to certain extent customized to the wishes of the end-customers but not to the desires of Vattenfall. Based on this fact, it is concluded that Feenstra did not need to invest in physical assets specific for the organizational relationship with Vattenfall and for that reason the physical asset specificity is low.

The human asset specificity is also low. In the organizational relationship between Vattenfall and Feenstra, Feenstra does not need to make investments in order to execute the activities for which it is responsible. Feenstra does not need to invest in mechanisms to control the Vattenfall's sales department. The commercial activities do not require tacit knowledge and therefore there is no need for investments in knowledge regarding the commercial activities of Vattenfall. Above that, it is trusted that Feenstra does not need to control Vattenfall on the commercial activities<sup>15</sup>.

The temporal asset specificity is high because the maintenance and reparation management is complex. When a heat or ventilation application is broken it is important that it is fixed as soon as possible because heat is an important basic need. To keep the customer satisfied it is necessary that Feenstra can provide the maintenance and reparation services as soon as possible. The satisfaction is important to safeguard its brand-name reputation.

The site asset specificity is low. Feenstra has a wide local coverage in the Netherlands and because of that transportation expenses can be minimized. But this local coverage is not specific for the organizational relationship with Vattenfall. Furthermore, the value of local coverage remains present even though the organizational relationship ends. Based on this, the site asset specificity for Feenstra perspective is ranked low.

The brand-name capital for Feenstra is also ranked low for the same reasons as for Vattenfall. Summarized, from Vattenfall's and Feenstra's perspectives the total asset specificity is low.

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<sup>14</sup> Employee of business development, 2012

<sup>15</sup> Supply chain management Feenstra, 2012

#### 4.5.6.3. Resource dependency

##### *Technical resources*

Feenstra contributes its technical resources to install the heat and ventilation applications. The equipment and vehicle are technical resources that are tangible. Feenstra also contributes intangible technical resources to the organizational relationship. Feenstra analyzes the houses in order to determine the appropriate heat or ventilation application for the customer. To do this appropriately technological knowledge needs to be in-house. The tangible and intangible technical resources are not strategic. The tangible resources are not rare and can easily be imitated and substituted. The knowledge of the employees is also not strategic or tacit. The knowledge is not rare and can be transferred without the need of intensive training sessions<sup>16</sup>.

The geographical spread that Feenstra has due to its branches that are spread over the Netherlands is ranked as a slightly strategic resource in this research. Especially because Feenstra is the only one that has this wide geographical coverage in the Netherlands<sup>16</sup>. Note that this geographical spread is slightly strategic because it can be substituted or imitated. But it is not identified as not strategic in this research because it is assumed that it cannot be easily be substituted or imitated in a short period of time.

##### *Commercial resources*

Vattenfall contributes its commercial resources to create leads. Leads are potential clients which Nuon creates through either personal contact, or a direct mail to clients who are registered in the client database or through advertisements on their webpage. From these leads a certain percentage converses in real customers that install a heat application or make use of the maintenance services.

For Feenstra it is important that enough leads are generated in order to guarantee profits. Feenstra's activities are labor intensive and the company needs to sell a certain amount of heat and ventilation applications in order to guarantee profits. In addition, it is also important that these leads are generated before the winter period because the operation costs to install heat and ventilation applications are higher during the winter period than in the summer period<sup>16</sup>. Thus, Feenstra depends on the commercial activities and resources of Vattenfall even though the commercial resources of Vattenfall are not strategic resources. They are not strategic because these activities and resources can easily be provided by other utilities. This dependency is created by the hierarchical organizational governance structure that is implemented to manage and control the organizational relationship. The hierarchical governance structure limits Feenstra's ability to contact customers. Feenstra could only contact customers through Vattenfall's sales department. It is also important to acknowledge that the sales department Feenstra had prior to the organizational relationship decreased over time which made Feenstra become more dependent on the commercial resources of Vattenfall over time.

Financial resources and social resources are not analyzed for this organizational relationships since the organizational governance structure is an acquisition.

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<sup>16</sup> Employee of Feenstra, 2012

Summarized, Vattenfall depends on Feenstra's technical resources and their geographical spread in the Netherlands which is unique till this day. Feenstra has the ability to provide heat and ventilation applications and services in almost whole Netherlands. Feenstra depends on the commercial resources of Vattenfall in order to broaden its customer portfolio. Based on this, it can be concluded that both Vattenfall and Feenstra are mutually dependent on each other in order to commercialize the heat and ventilation applications and services successfully.

#### 4.5.7. Practice versus theory

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The organizational governance structure (acquisition) that is implemented in 2001 is not in accordance to TCE and RBV reasoning. Table 13 summarizes the case.

The choice for a complete ownership through an acquisition is not logical from TCE perspective. From TCE perspective a market organizational governance structure fits this organizational relationship the best since the asset specificity is low, as well as the uncertainties for both Vattenfall and Feenstra.

From a RBV perspective it is also not logic to acquire Feenstra. The resource dependency among Vattenfall and Feenstra is not very strong. They are no strategic resources involved and both Vattenfall and Feenstra could operate independently. As mentioned in paragraph 4.5.6., Feenstra has become more dependent on the commercial resources of Vattenfall over the years which could make a hierarchical organizational governance structure in preference from Feenstra's perspective compared to 2001. But as mentioned before Feenstra prefers to create its own leads and for that reason it remains more logic to manage and control the organizational relationship through an market organizational governance structure than through a hierarchical one.

An explainable reason why the organizational governance structure is not in accordance to the TCE and RBV reasoning could be the argument that an hierarchical organizational governance structure was chosen because of the corporate strategy to broaden the product portfolio in 2000. As described in the case it was expected that an acquisition would give strong signals to the market that Nuon took it seriously to broaden its product portfolio.

**Table 13 Summary case2: Heat and ventilation applications - Feenstra**

A. General overview						
Market			Mature market and not so vulnerable for changes in other related markets			
Product & service			Products and services are mature. Products and services are standard except for the reparation service which is complex because there is urgency behind the reparation.			
Partner			Feenstra is a well-known company. Feenstra was established years before the organizational relationship started. With its 20 branches spread over the Netherlands Feenstra has a wide geographical spread which is unique in the Netherlands.			
Division of labor			The organizational relationship concerns the delivery of ventilation and heat applications. These applications are developed by other organizations. The main responsibility of Vattenfall is the marketing and sales. Feenstra is mainly responsible for the installation and maintenance services.			
B. Organizational governance structure (OGS)						
Implem ented OGS	Financial structure		Hierarchical (Acquisition)	Hybrid (Equity)	Hybrid (Non-equity)	Market (Buyer-Supplier contract)
	Control mechanisms	Output	SLA (sales targets)			
		Process	SLA (leads targets)			
		Social	Participatory decision-making process			
C. Theoretical constructs TCE and RBV						
Environmental uncertainty	Low	Moderate	High	Total uncertainty	Low	
Behavioral uncertainty	Low	Moderate	High			
From Vattenfall's perspective				From partner's perspective		
Asset specificity	Low	Moderate	High	Asset specificity	Low	Moderate High
Resource dependency	Low	Moderate	strong	Resource dependency	Low	Moderate Strong
D. Alignment between implemented OGS and OGS pre-described by TCE and RBV						
OGS from TCE perspective			Hierarchical	Hybrid (hierarchical)	Hybrid (market)	Market
OGS from RBV perspective			Hierarchical	Hybrid (hierarchical)	Hybrid (market)	Market



#### 4.6. Cross case analysis

In paragraph 4.7.1 the two cases discussed above are compared by discussing their similarities and differences. In paragraph 4.7.2 some other cases which are studied in this research, which are not analyzed in such depth as the two described cases, are considered in order to formulate general conclusions regarding the management and control of organizational relationships.

The case studies were selected based on differences in: the implemented organizational governance structure, products and services, product complexity, product maturity, partner type, and customer interface. However, as indicated in Table 14 the two case studies also showed some similarities.

Table 14 Overview case 1 and 2			
	Case 1 Greenwave		Case 2 Feenstra
Actual organizational governance structure	Hybrid		Hierarchical
Product and service	E-manager		Heat and ventilation applications
Product complexity	Moderate		Low
Product maturity	Immature and underdevelopment		Mature and developed
Partner	Greenwave (a small external and start-up company)		Feenstra (a large and well-known company)
Customer interface	Vattenfall		Shared
Market	Turbulent - immature		Stable – mature
Activities	Development to delivery		Delivery
Commercial resources	Vattenfall		Vattenfall
Technical resources	Both but mainly Greenwave		Feenstra
Financial resources	Vattenfall		Vattenfall
Organizational governance structure according to TCE and RBV reasoning	Hybrid		Market

In both cases the commercial activities are executed by Vattenfall. This is explained as Vattenfall already had a large customer data-base and a strong brand reputation. Through this data-base and reputation Vattenfall has the ability to contact customers and inform them about energy-related products and services more easily than the partners. Based on this it can be concluded that Vattenfall's main value proposition in these organizational relationships is the execution of commercial activities.

The main value proposition of energy-related companies is to commercialize the product successfully from a technical perspective. These organizations have the technical resources and because of that Vattenfall seeks for organizational relationships with them in order to develop their resources and commercialize energy-related products and services through the relationship.

But as the cases clearly illustrate, there is a difference between products that are still under development and products that are already developed. Case 1 shows a product that is under development and in case 2 the heat applications, the isolation- and security systems are completely developed. This difference also has implications on the organizational governance structure which is explained in depth in the next paragraph.

Based on the evaluation of the transition phase of the Feenstra case, it can be concluded that previous history influences the option within the new organizational governance structures. Previous organizational relationships cause system integration which leads to path dependency. The presence of path dependency makes it becomes harder for the dependent entity to operate as an independent entity right away after the ending of previous organizational governance structure. This dependency therefore limits the options of the possible organizational governance structures that can be implemented.

#### 4.6.1. Other cases and observations

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Few other cases were analyzed in this research: the EnergyWatch case, the Volvo, and solar panel case. The findings of these cases also provide insights in the relation between factors and the organizational governance structure.

The EnergyWatch case concerns the organizational relationship between Vattenfall with a Swedish company through which Vattenfall launches a similar product as the E-manager, called the EnergyWatch, on the Swedish market. By comparing this case with the E-manager it becomes clear that the maturity of the product matters. As described in case 1 the partner Greenwave already had a developed product that only needed to be fine-tuned in order to fit in the Dutch market and meet the desires of Vattenfall. The partner in Sweden did not have such a developed product and therefore Vattenfall was more involved in the development of the product compared to the case with the E-manager in the Netherlands.

The organizational structure between Vattenfall and the Swedish company is different from the organizational governance structure between Vattenfall and Greenwave. As already mentioned, a non-equity alliance was implemented for the organizational relationship between Vattenfall and Greenwave, whereas an equity alliance is implemented for the organizational relationship between Vattenfall and the Swedish company. Vattenfall and the Swedish company share intellectual property rights and risks. Based on this it is concluded that there is a relationship between the maturity of the product and the financial structure of the organizational governance structure. The more mature the product, the more likely a hybrid or market financial structure will be chosen instead of a hierarchical financial structure. This is explained as follows: the more mature the product is, the smaller the need for developments and adjustments to the product and therefore less investments. In line with this reasoning, co-developing organizational relationships make it more likely that the financial structures have hierarchical characteristics. In organizational relationships where the partners need to co-develop a (new) product, the dedicated asset specificity of both partners increases. The other way round, the more mature the product the lower the dedicated asset specificity. To safeguard the asset specific investments a hierarchical structure is preferred which is in line with TCE reasoning.

It also can be concluded that besides the maturity of the product the amount of investments needed to develop the product matters. The inter-organizational relationship of Vattenfall with Volvo provides some insights in this reasoning. Volvo Cars and Vattenfall launched their joint venture in 2007. Together they are developing a diesel plug-in hybrid electric vehicle (PHEV) (Vattenfall, 2012b). With plug-in is meant that the battery can also be loaded directly through the electrical network (van Woerkom, 2012). The PHEV is as complicated as well as a complex product. PHEVs are directly connected to the electrical network through which the battery is loaded. The weakness of this connection is the impact on the electrical network when PHEVs are introduced on a large-scale. On the other side, PHEVs can function as distributed energy storage devices in the network system. This can minimize the risk caused by violating renewable energy resources, such as solar energy (Peng, 2012). In this inter-organizational relationship Vattenfall exchanges her financial resources and knowledge concerning the energy market with Volvo. In return Volvo commits mainly its technical resources. In order to have greater control over the financial flows Vattenfall has chosen for a hierarchical financial structure (joint venture)<sup>17</sup>. Thus, the amount of investments influence the choice for a hierarchical or a market financial structure as well.

Moreover, some other observations are made in other cases. In Sweden the solar boiler project is governed through the same organizational governance structure that is implemented for a solar boiler project in the Netherlands<sup>18</sup>. In this case the organizational governance structure is not so much determined on the characteristics of the context in which it is embedded. It is rather chosen because of satisfactory reasons. This effect is called the bandwagon effect which is also recognized in literature (Smith, 2008). The bandwagon effect refers to the lack to consider the differences in partners and resources when the product for which a organizational relationship will be made is the same.

Next to case 1, the influence of trust is also discussed directly or indirectly during the interviews. An employee of the product development department argued that it is important to have a partner who is trustable. Another employee of the purchase department argued that the partner must make eye contact during the negotiation process concerning the organizational governance structure. This argument indirectly illustrates that social factors matter in decision-making processes concerning organizational governance structures.

Thus, the cross case analysis gives a better understanding regarding the relationship between product maturity and organizational governance structures. The empirical findings also give insights in the relation between the amount of financial capital invested in the project and the organizational governance structure. The case studies give an insight into possible relationships, but do not yet provide scientific evidence for the identified relationships. Scientific analysis of multiple cases is needed to prove the identified relationships. Next to the identified relationships no clear conclusions can be made regarding the relation between product complexity and customer interface with organizational governance structures based on the empirical evidence.

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<sup>17</sup> Employee of Product development - Volvo, 2012

<sup>18</sup> Employee of Product development – Solar boiler, 2012

#### 4.7. Concluding remarks

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This chapter answers sub-question 3: *Are TCE and RBV useful theories to analyze the governance of organizational relationships between Vattenfall and energy-related companies?*

The case studies indicate that both TCE and RBV provide useful guidelines to analyze the management and control of organizational relationships. However, to gain more insight in the decision-making process concerning organizational governance structures it is recommended that some other aspects that are not included in the TCE and RBV theories are also taking into account.

##### *Useful items from TCE and RBV*

It is concluded that, TCE and RBV provide three useful elements to analyze governance structures for organizational relationships based from the case study analysis. These three elements are: the four different categories in which factors can be categorized, the theoretical constructs of TCE, and resource dependency from RBV.

1. By analyzing the organizational governance structures through the theoretical lens of TCE and RBV, it became clear that the factors can be classified in four different categories. The four categories are factor characteristics in the market, product and service, actors, and resources.
2. From TCE perspective, the usefulness of theoretical constructs differ per case. The findings demonstrate that among cases the theoretical constructs brand-name capital, human asset specificity and dedicated asset specificity have most commonly an impact on the organizational governance structure.
  - a. Brand-name capital plays a vital role because having a strong brand-name reputation is of great importance. Strong brand-name reputation attracts clients. As mentioned in paragraph 1.3. the purpose of the downstream customer interfacing business strategy is to generate new revenue streams. To do so, it is important to attract customers.
  - b. Human asset specificity is also important within these relationships, especially were new products and services are developed such as the E-manager. These energy-related markets are turbulent markets where new innovations pop up. In order to be active within these markets it is necessary to gain knowledge concerning these products and services. This knowledge is rather rare since the products and services are under development. Organizations need to learn the characteristics of the products and services in order to execute the activities it contributes to the organizational relationship or to have the knowledge for the sole purpose to manage and control the organizational relationship. Thus organizations need to invest in their employees to have the necessary knowledge in-house to carry the activities appropriately and to manage and control the organizational relationship efficiently.
  - c. Dedicated asset specificity: if products are not fully developed, investments are needed, which argues for a more hierarchical financial structure.
  - d. Even though physical-, temporal- and site asset specificity can also be present in cases they are less common in cases than the other constructs.
3. From RBV perspective it can be concluded that resource dependency is created along organizational relationships. In both cases analyzed in this research Vattenfall's main responsibility is the execution of the commercial activities supported by their commercial

resources. The energy-related partners mainly contribute their technical resources. This resource exchange makes Vattenfall and the partner mutually dependent. However, the commercial resources of Vattenfall are in some cases less strategic than the technical resources of the partner. This is because the commercial resources of Vattenfall are easier to interchange as competitors can have similar commercial resource, and as a consequence that Vattenfall is likely to be more dependent on the partner than the partner on Vattenfall.

*Additional relevant items in the decision-making process regarding governance structures*

As described above, the case studies also indicated that TCE and RBV do not include all relevant aspects in the decision making process regarding governance structures. These additional relevant aspects are that are not included by TCE and RBV are:

- the factors trust, corporate strategy and the bandwagon effect that influence the choice for an organizational governance structure
- insights regarding the choice behind control mechanisms
- insights in the decision-making process
- the link between risks and organizational governance structures
- the path dependency that is subject to the design of organizational governance structures.



## 5. Decision-making processes and social systems

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*Chapter 2 and 3 have clearly explained the purpose of organizational governance structures, the variety within them, and how these organizational governance structures can be analyzed from a TCE and RBV perspective. As stated in chapter 4, it is necessary to look beyond TCE and RBV in order to design a framework that needs to support decision-making processes concerning organizational governance structures. This chapter concentrates on the analysis of decision-making processes concerning organizational governance structure.*

*First, this chapter elaborates on the need of analyzing decision-making processes, the general types of decision-making processes and how the characteristics affect the research objective. Secondly, the social system in which the decision-making process is embedded and how the social system influences the decision-making process are discussed.*

### 5.1. Decision-making processes

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TCE and RBV do not place decision-making processes and decision-makers at the central core even though the decision-making process and the decision-maker have significant impact on the outcome of the decision-making process (T. K. Das, Teng, B.S., 2001). Therefore, this research includes an analysis of decision-making processes and includes the impact of decision-making processes in the decision framework.

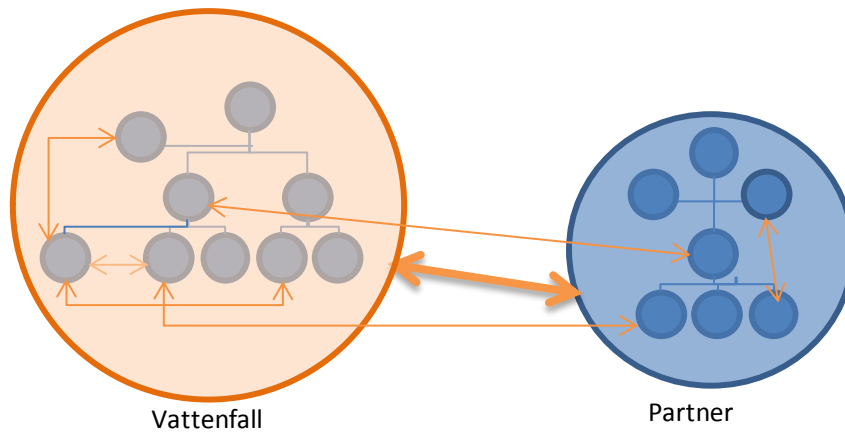
De Bruijn (2008) makes a distinction between two types of decision-making processes:

- Decision-making processes in a purely hierarchical structure
- Decision-making processes in multi-actor system

An important distinction between these two types of decision-making processes is that in the former process there is one actor that is hierarchal superior to the other involved actors, whereas, in the latter there is not one actor who is hierarchically superior to others (de Bruijn, 2008 ).

#### *Actors*

The decision-making process that is central in this research is rather in multi-actor setting than in a purely hierarchical structure. In inter-organizational relationships two organizations are involved and various departments in these organizations. In intra-organizational relationships the involved actors are the departments within the organizations.



**Figure 15 Involved actors**

Figure 15 illustrates the organizations (big circles), the departments (small circles) and the connections between organizations and departments (arrows).

At Vattenfall the involved departments in the decision-making processes concerning organizational governance structures are business development, product development, legal, transaction risk, purchase and finance<sup>19</sup>. The responsibilities of the departments and when they play a vital role in the decision-making process differ. For example, when a project is in the pilot phase it falls under the responsibility of the business development department. And when a product is ready to be launched on the market the project falls under the responsibility of the product development department.

Formal and informal cooperation paths among these departments are not analyzed because the impact of the characteristics of decision-making processes in multi-actor is the focus in this research. To gain more in depth knowledge regarding the formal and informal cooperation paths within the organizations Mintzberg's research concerning organizational structures is recommended.

### 5.1.1. Complexity in decision-making process

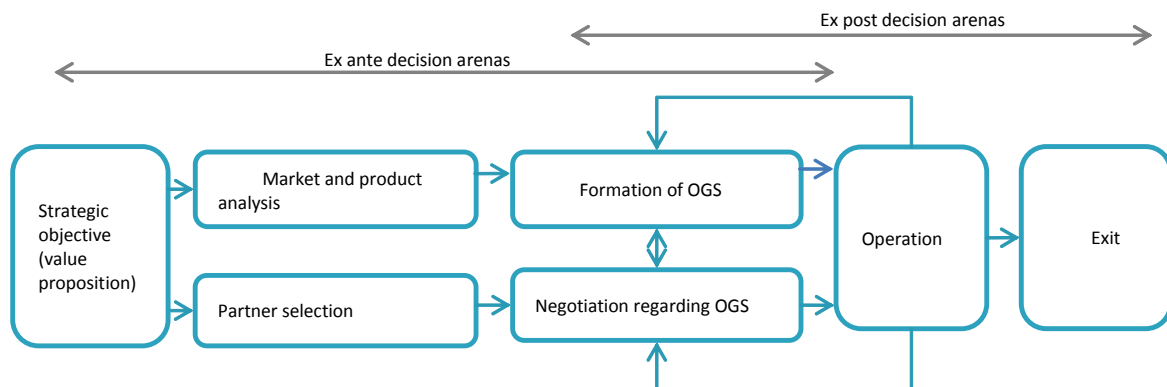
There are three characteristics of the decision-making process concerning organizational governance structures that make the process complex, as a result a project-based approach is not applicable. The three characteristics are joint decision-making, ex ante and ex post decision making, and various decision arenas of decision making process, that are described below.

First, decisions concerning organizational governance structures are joint decisions taken by the several departments of Vattenfall. None of the departments or organizations is superior to another and without support of all the involved actors it is questionable whether the organizational governance structure will guarantee success. This joint decision making characteristic makes the decision-making process complex compared to decisions that are made by a single departments. The complexity is caused by the various goals and interests of the involved department which need to be aligned in order to have a joint decision. And aligning the goals and interest is difficult since the goals and interests can differ and be conflicting at the same time(de Bruijn, 2008 ).

<sup>19</sup> Employee from product development



Secondly, decision-making processes concerning organizational governance structures are not conducted at a certain moment in time which makes the process more complex. They are taken along the organizational relationship life cycle. As mentioned in chapter 3, TCE does make a distinction between ex ante and ex post transaction costs. Williamson (1979) recognized the fact that organizational governance structures are designed partly ex ante and partly ex post, because not all information is available from the beginning due to changes in the context in which the organizational relationship is embedded. It is important that organizational governance structures are reviewed, adjusted over time or even completely redesigned to cope with the changes.



**Figure 16 Decision arenas**

Thirdly, Decision-making processes concerning organizational governance structures take place along various decision arenas divided over the organizational relationship life cycle as shown in Figure 16. In Figure 16 organizational governance structures are abbreviated as OGS. It must be acknowledged that Figure 16 provides a simplified overview of various decision arenas. The simplicity of the figure can confuse the capriciousness of the decision-making process. This figure can create the idea that the decision-making process is based on a sequential approach which is not the case in practice. In practice, the order of the arenas can differ and they are not strictly divided as illustrated in Figure 16. The partner selection and determination of organizational governance structures can overlap. Aspects that are important to consider in the organizational governance structure can partly be covered by partner selection criteria. It could also be the case, for example, that the organizational governance structure is decided prior the partner selection for corporate strategy or regulatory reasons (Appendix C - Workshop results; (Smith, 2008)).

Among these decision arenas iterations take place. For example various iterations can take place between the determination of the organizational governance structure and the negotiation regarding organizational governance structures. These iterations take place till both Vattenfall and the partner agree on the organizational governance structure. There are also iterations between the operation phase and negotiation regarding OGS since it is impossible to define an organizational governance structure till the end of the organizational relationship.

Decisions from previous decision arenas influence the possibilities and outcomes of the arenas that follow. In other words, there is path dependency among the decision arenas. As discussed in paragraph 4.6. previous organizational relationships also have impact on the possibilities and outcome of the decision-making process.

The absence of a specific order of decision arenas, the iterations among these decision arenas, and the impact decision arenas have on each other contribute to the complexity of the decision-making.

Due to the complexity of the decision-making process concerning organizational governance structures a project-based approach is too simplistic. A project-based approach follows sequential phases from problem identification to an organizational governance structure, which is not applicable for decision-making processes concerning organizational governance structure.

## 5.2. Social systems and trust

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The decision-making process concerning the organizational governance structure takes place in multi-actor setting and is embedded in a social system. Both TCE and RBV are economic theories that lack to consider social aspects (B. Nooteboom, Berger, H., Noorderhaven, N.G. , 1997). Therefore, it is insufficient to design a framework that only considers TCE and RBV as the main constructs. The analysis should also include social aspects. Social aspects provide a better understanding of subjective forces that influence decision-making processes. Trust is considered to incorporate a social aspect. As Arrow (1974, p.23) argues: *“trust is an important lubricant of the social system”*

Trust interacts with the choice for an organizational governance structure. Trust impacts the choice for a financial structure and on the effectiveness of control mechanisms.

### 5.2.1. Definition of trust

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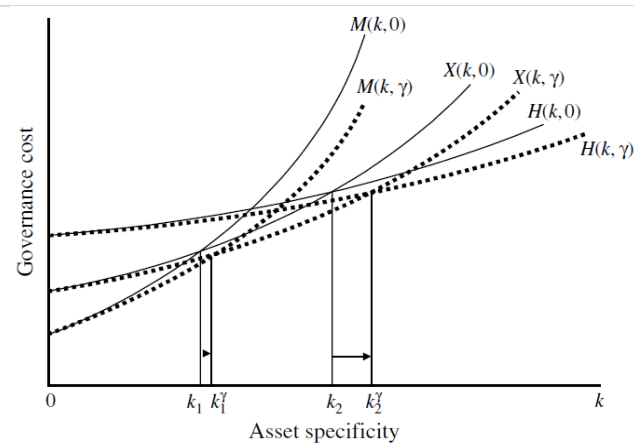
Broadly defined, trust is the expectation that the partner will not act opportunistically (Bradach and Eccles). Nooteboom (1997) defines trust as follows: *“Trust may concern a partner’s ability to perform according to the intentions and expectations of a relationship or his or her intentions not to defect”*. Nooteboom (1997) sees trust as a multi-dimensional construct, whereas, others define trust as a single dimension. In Nooteboom’s definition of trust the distinction between competence trust and intentional trust is made. The latter is also called goodwill trust. In addition to Nooteboom (1979), Das (2001) also makes use of this distinction when defining trust. Goodwill trust and competence trust are considered to define trust, in this research. Competence trust implies trusting the partner in his or hers competence and capability to accomplish the given tasks. Goodwill trust implies trusting the partner cooperates in good faith rather than behave opportunistically (Das, 2001). Other dimensions which Seppanen (2007) outlines in his research (Seppanen, 2007) are not considered in this research, furthermore, it should be noted that the level of analysis is on an organizational level, i.e. intra- and inter-organizational trust, rather than on an individual level, i.e. inter-personal trust.

### 5.2.2. Substitution and complementary effect of trust

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The substitution and complementary effect of trust are discussed by various scholars. Gulati (2008) concludes that trust can be a substitute for hierarchical organizational governance structures. Trust serves as an control mechanism. The implication is that less hierarchical organizational governance structures will more likely be chosen when there exists trust among the involved actors. Trust reduces the need for control through formal governance mechanisms because there are positive expectations about each other’s behavior. This reduction of the need for formal governance

mechanisms reduces costs spent on governance and flattens the cost curve of the organizational governance structure. This flattened curve implies that less hierarchical organizational governance structures can be chosen for a transaction with the same degree of asset specificity in a situation where partners trust each other. Figure 17 illustrates how the curve flattens and how this results in a shift from one organizational governance structure to another (Gulati 2008).



**Figure 17 The impact of trust on the governance costs as a function of asset specificity (Gulati 2008).**

Legend: H- hierarchical, X – Hybrid and H –Market

Consider point  $k_2y$  on the asset specificity axis. Without trust the organizational governance structure that fits the best would be a hierarchical structure. Point  $k_2y$  intersects with  $H(k,0)$  which is the governance cost curve for hierarchical organizational governance structures. When there is trust among the partners the point  $K_2y$  intersects with the  $X(k,y)$  which presents the governance cost curve of hybrid organizational governance structures. Thus, a less hierarchical organizational governance structure can be implemented when trust becomes a factor among partners (Gulati 2008)

Trust also has the ability to complement organizational governance structures by enhancing performance. The reduction of the need for formal control mechanisms reduces the governance costs because less control mechanisms have to be implemented to manage and control the organizational relationship than when there is no trust among the actors (Gulati 2008). The governance cost is not only reduced because there is less need for control mechanisms but also because trust mitigates conflicts that can result in high costs (Gulati 2008; Krishnan, 2006). This reduction of costs translates itself in greater performance.

Among these effects the complementary effect has a greater range than the substitution effect. The substitution effect only occurs where organizational governance structures shift from one structure to the other. This occurs where the functions of the organizational governance structures intersect (Gulati 2008). Within Figure 17 the intersections are denoted as  $k_1$ ,  $k_1y$ ,  $k_2$  and  $k_2y$ . The complementary effect on the other hand is not limited in its occurrence. Trust complements any organizational governance structure and has a greater effective range than the substitution effect of trust.

### 5.2.3. Effectiveness of control mechanisms

The complementary effect of trust can be further explained by the impact of trust on the effectiveness of control mechanisms (T. K. Das, Theng, B.S., 2001). A lack of goodwill trust can result in suspicious behavior. Organizations can wonder whether control is implemented for the purpose of advancing the partners' interest instead of the common interest. A lack of competence trust can lead to a situation in which organizations question whether the control mechanisms are the correct ones.

The suspicion of organizations about the purpose for and the correctness of the control mechanisms hampers the effectiveness of control mechanisms.

The interaction between trust and control mechanisms is reciprocal. Output control and process control, which are categorized as formal control, have a negative impact on trust. Das (2001) argues that formal control mechanisms may undermine trust. Formal control mechanisms limit the autonomy of a company to decide what works best and as a consequence an atmosphere of mistrust may be created. On the other hand, social control has a positive impact upon trust. Trust develops where the involved actors cooperate closely together. Joint decision-making creates mutual goals and trust and for that reason Das (2001) defines social control as trust breeding.

#### 5.2.4. Determinants of trust and its effectiveness

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As mentioned above, trust plays a vital role in decision-making processes concerning organizational governance structures. How trust develops is a question which is not yet discussed. This is a challenging question to answer because trust is a reciprocal construct, thus, being potentially both the cause and partly an effect (Sepanen, 2007). To identify the determinants of trust a deeper analysis should be executed. This research does not execute such a in-depth analysis. The focus is to understand the effect of trust in decision-making processes concerning organizational governance structures and how to incorporate trust in the framework design. But social mechanisms are considered as trust breeding mechanisms and formal control mechanisms not discussed by Das (2001).

To understand the effect of trust, it is also important to gain understanding regarding the effectiveness of trust. The effectiveness of trust is discussed by Krishnan (2006). Krishnan (2006) concludes that the effectiveness of trust differs among the uncertainties which are categorized in behavioral uncertainties and environmental uncertainties. The effectiveness of trust on performance is higher in a context where behavioral uncertainties are more present than environmental uncertainties. The effectiveness of trust can be less where environmental uncertainties are high due to the downside risk of trust. Trust can reduce the alertness among partners. The tendency to screen the information provided by the partner decreases and the inclination to accept the information increases when there is trust among the partners and that errors can be made as a consequence (Krishnan, 2006). It is important to keep the downside risks of trust, such as overconfidence, in mind especially when the environmental uncertainties are high.

#### 5.3. Concluding remarks

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As concluded within chapter 4, TCE and RBV do not give enough insights to design a decision-making framework. They lack incorporating the characteristics of decision-making processes that are embedded in a social system.

Decision-making processes concerning organizational governance structures take place in an unstructured way in multi-actor setting and dynamic context. Therefore, it is a complex process. Trust also plays a vital role in the decision-making process since the process is embedded in a social system.

Decision-making processes concerning organizational governance structures are complex due to three characteristics of the decision-making process. The complexity is caused by the fact that:

1. Decision-making processes take place in multi-actor settings, where the involved actors need to make joint decisions. Joint decisions are not easy since the goals and interests of the involved actors are not always aligned.
2. The decision is not taken at one certain moment in time but along the organizational relationship life cycle. Organizational governance structures need to be adjusted over time to cope with changes in the context.
3. Various decision arenas support the decision-making process. The lack of a specific decision arena order, the iterations among these arenas and the impact they have on each other make the decision making process complex.

This complexity imposes certain constraints on the design of the framework. It becomes clear that it is impossible to design a framework that advises a particular organizational governance structure from the start that manages and controls the organizational relationship successfully till the end with the complexity in mind.

In addition, the impact of social systems plays a crucial role during these decision-making processes besides the complexity in the decision-making processes. Trust is considered to be the social factor and it plays a vital role in the governance of organizational relationships. It has an impact on the choice for a particular organizational governance structure due to its complementary and substitute effects. Trust also has an impact on the effectiveness of control mechanisms and for that reason it needs to be considered in the framework.

# PHASE II

## Framework design & application

Chapter 6: Framework design

Chapter 7: Framework evaluation and application

## 6. Framework design

*In this chapter the design of the framework stands central. To design the framework in a structured matter a design process is plotted which is primarily discussed in this chapter. Secondly, the design requirements, and thirdly, the design space are discussed. Thereafter this chapter explains the framework and how the framework works .*

### 6.1. Design process

Several steps, as illustrated in Figure 18, are executed to structure the design process. These design steps are based on the META-model (Herder, 2004) and the design science research by Pfeffer (2007).

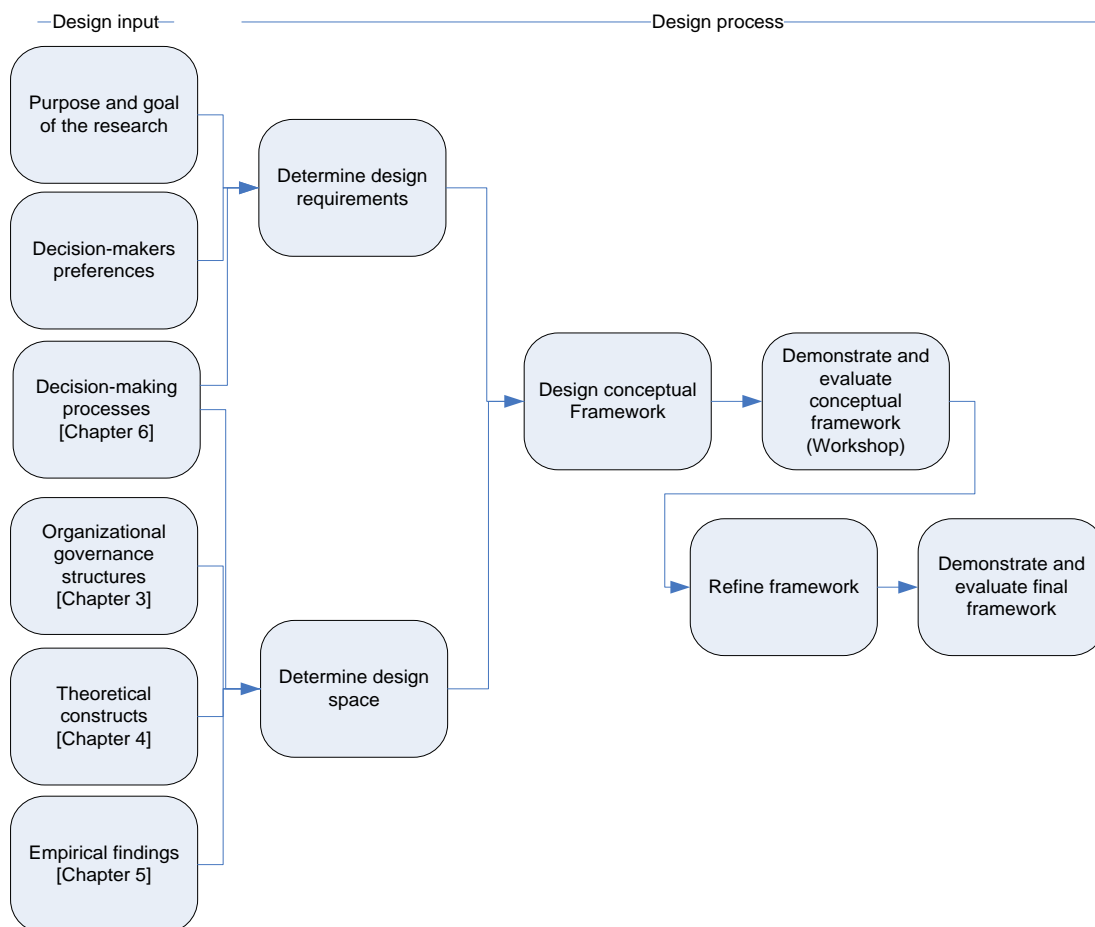


Figure 18 Design approach

The design requirements and the design space are determined before the design of the framework. Figure 18 illustrates the design input that is used to determine the design requirements and design space. With the design requirements and space a conceptual framework is designed. This conceptual design is, thereafter demonstrated and evaluated by experts of Vattenfall through a workshop. Based on the feedback of the experts the framework is refined.

## 6.2. Design requirements

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It is essential to consider what type of advice decision-makers prefer, when it comes to the design of a support framework. Advice is defined as a recommendation given to decision-makers concerning which alternative to choose (Dalal, 2010). Dalal (2010) defines four types of advice: recommendations in favor of a particular alternative (“Recommend for”), recommendations against (“Recommend against”), provision of information concerning one or more alternatives (“Information”), and provision of the process by which the decision is taken (“Decision support”).

Vattenfall is interested in a framework that supports their decision-making process by either giving advice about which organizational governance structures to choose (Recommend for) or not (Recommend against)<sup>20</sup>. However, it is impossible to design a framework that advises a particular organizational governance structure for four reasons discussed in chapter 2, 4 and chapter 5:

1. There is not one particular organizational governance structure that fits in the context. As a matter of fact, various organizational governance structures can fit the context as discussed in chapter 2.
2. It is impossible to design a generic framework that covers all aspects that are relevant to incorporate in each case because each case is unique as discussed in chapter 4.
3. The organizational governance structure is adjusted over time or even completely redesigned as discussed in chapter 5. This makes it impossible to recommend a particular organizational governance structure that lasts till the end of the organizational relationship.
4. Various actors are involved who need to make a joint decision regarding the organizational governance structure as discussed in chapter 5. This makes it also impossible to design a framework that advises one particular organizational governance structure without considering the negotiation process.

The design requirements are formulated based on the requirements that are discussed during meetings and based on the characteristics of the decision-making process concerning organizational governance structures. The following design requirements are considered in this research:

- The framework should provide an overview of the organizational governance structure that is underpinned by a financial structure, different control mechanisms and a type of trust.
- The framework should provide guidelines by providing, in an ordered manner, the steps through which decision-makers can design an organizational governance structure that fits the context in which the organizational relationship is embedded.
- The framework should cover the complexity concerning organizational governance structures. Complexity defines the variety in the topic and dynamic of the decision-making process as discussed in chapter 6.
- The framework should be straightforward in order to grasp the essence quickly.
- The framework should also be suitable to evaluate current organizational governance structures.
- The framework should be flexible.

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<sup>20</sup> Employee of product solutions, 2012



### 6.3. Design space

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The design space consists of the design variables and design relations.

#### *Design variables*

As discussed in chapter 2, organizational governance structures shape organizational relationships, and manage and control the risks that accompany organizational relationships. To gain understanding, how the financial structures, control mechanisms, and type of trust in the decision-making process should be designed, it is necessary to define the risks that accompany organizational relationships. By focusing on the risks that accompany organizational relationships decision-makers get aware of the relevant aspects they need to consider during the decision-making process to mitigate these risks. It is important that these risks are mitigated in order to guarantee the value creation and appropriation that are provided by the organizational relationship.

Previous chapters made it clear that TCE and RBV provide valuable insights in the factor characteristics that should be considered to analyze decisions concerning organizational governance structures. However, TCE and RBV do not provide complete insights to understand how to determine the organizational governance structure based on factor characteristics. The missing elements are the characteristics of the decision-making process. It is important to incorporate the fact that the decision-making process takes place in multi-actor setting. The social system in which the decision is embedded should be considered next to these economic theories and for that reason trust should not be forgotten as an element of the organizational governance structure. When it comes to organizational governance structures, it is necessary to understand the relation among the financial structure, control mechanisms and type of trust.

Summarized, the decision framework should incorporate the following design variables:

- The organizational governance structures underpinned by the financial structure, control mechanisms, and type of trust as discussed in chapter 2 and 5.
- Types of risks as discussed in chapter 2 and 4.
- The four categories in which factor characteristics are categorized (Market, Product, Actors, and Resources) as discussed in chapter 4.

#### *Design relations*

Besides the design variables, it is also important to incorporate the relations among these variables. Chapter 2 elaborated on the financial structure and the control mechanisms that underpin the organizational governance structure. The choice for control mechanisms depends on the risks that accompany the organizational relationship as discussed in paragraph 2.4.

- TCE and RBV, as discussed in chapter 3, provide insights in the following relations among these variables:
- The higher the asset specificity, the more hierarchical the organizational governance structure.
- The higher the uncertainties, the more hierarchical the organizational governance structure.
- The stronger the resource dependency among the involved actors, the more hierarchical the organizational governance structure.

Based on the findings of the case study analysis, it is concluded that there is a relation between the product maturity and the organizational governance structure.

- The more mature the product, the less hierarchical the organizational governance structure.
- The more financial capital is exchanged, the more hierarchical the organizational governance structure.

Chapter 5 also provides insights in the relations between trust and organizational governance structure, the effectiveness of the control mechanisms and trust. These relationships are:

- The higher the level of trust among the involved actors, the less hierarchical the organizational governance structure.
- The higher the environmental and behavioral risks, the more trust and control should complement each other.
- Formal control mechanisms can hamper trust breeding, whereas social control mechanisms enhance trust breeding.

Based on the design variables and the relations described above the decision framework is designed. The feedback of the experts who participated in the workshop are also considered in the framework. In appendix C the workshop preparation can be found, as well as the conclusions of the workshop as far as they were valuable for the design of the framework.

#### 6.4. Functional design

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The decision framework is illustrated in Figure 19. The framework consists of the following three layers:

- The outer layer: Factor characteristics
- The middle layer: Risks
- The inner layer: Organizational governance structure (financial structure, control mechanisms, and type of trust)

These layers are connected and through these 3 steps decision-makers come to understand which aspects they should consider to design organizational governance structures that fits the context best. These steps are discussed in paragraph 0.

### 6.4.1. Outer Layer: Factors



**Figure 19 Decision framework**

Table 15 gives an overview of the four categories, in which the factor characteristics are categorized, that should be analyzed. The factor characteristics defined in these four categories are derived from literature, the findings of case study analysis, and the workshop.

Table 15 The outer layer – Factor characteristics	
Market	Product
Market maturity	Customized vs. Standard
Market complexity	Simple vs. complex (Product is complex when it is connected to other products)
Degree of competition	Under development vs. Completely developed
Product/service demand developments	Technical vs. Non-technical
	Season dependent vs. not season dependent
	Need for maintenance and reparation
Actors	Resources
Number of partners	Resource richness
Company maturity	Strategic resources
Strategy	
Brand reputation	

*Characteristics of market factors:*

- Market maturity: When innovations and developments are absent the market is defined as mature.

- Market complexity: A market is complex when it is interconnected with other markets and it is vulnerable for developments of the other markets. The higher the degree of interconnectedness and the more vulnerable for developments in these markets, the more complex the market.
- Degree of competition: The more organizations that are active on the energy-related market, the higher the degree of competition. Notice that the organizations do not have the energy-related market as their core business. As long as organizations are active and compete on energy-related markets they should be counted as a competitor.
- Product/Service demand developments: Adoption of the product and service of the market.

*Characteristics of product/service factors:*

- Customized versus standard: Products/services are customized when the product/service is adjusted in detail to the needs of the customer. A product/service that is adjusted to the market is not a product that is fully customized. Standard products/services are products that are neither adjusted to the market nor to the customers' needs.
- Simple versus complex: Product/service complexity is determined by the interconnectedness of the product/service to other products and services and the vulnerability of the product/service for developments in the other products and services. The higher the degree of interconnectedness and the more vulnerable for developments in other products and services, the more complex the product/service. Thus simple products /services are products/services that are not interconnected with other products and services and/or are not vulnerable for developments in other products and services.
- Product/service under development versus completely developed product/service: A product /service is under development as long as technical and lay out features are not fully developed. However a distinction should be made between less developed products/services that need to undergo technical developments and products that only need (minor) lay out developments.
- Technical versus non-technical: Technical products/services are advanced products/services products from a technical perspective.
- Season dependent versus not season dependent: A product/service is seasonal dependent when the demand of the product/service is correlated with the seasons.
- Need for maintenance and reparation: Some products require maintenance and preparation service. And in some cases this there is urgency behind the preparation services.

*Characteristics of actor(s) factors:*

- Company size: It is necessary to determine the size of the company. The larger the size of the company the greater its bargaining power during the negotiation processes. The size of the company should be measured.
- Company maturity: The maturity of the company is related to the years it exists. Maturity depends on whether the company is a start-up or a well-known established company.
- Strategy: The vision of the actors concerning their future.
- Brand reputation: The reputation of the brand among the customers.

#### *Characteristics of resource factors:*

- Resource richness: Resource richness is related to the resources an organization has in-house. In this research commercial, financial, and technical resources are relevant to consider determining the resource richness of organization.
- Strategic resource: Resources can be defined as strategic as long as they are valuable, rare, inimitable and non-substitutable. Hence the degree in which the resources are strategic can differ.
- 

#### 6.4.2. Middle Layer – Risks

The performance risks and relational risks that organizational relationships face are further defined as output and process risk in this research. Performance can be measured through the output of the organizational relationship. Output is interpreted broadly. The quality of the product and the number of products sold are defined as output of the organizational relationship. The latter, relational risk is defined as a process risk because risks caused by the behavior of the actors can be measured and managed through the processes.

To categorize the risks, it is necessary to determine whether the risk is caused by the behavior of the actors or by environmental factors that actors do not have under their control. If the risk is caused by the behavior of the actors the risk can be defined as a process risk. If the risk is caused by external factors that cannot be influenced by any of the actors it can be defined as an output risk.

Table 16 shows a couple of risks that can accompany organizational relationships. Notice that the risks covered by Table 16 does not represent all the risks organizational relationships can face. Table 16 only provides some examples. The determinants of these risks are explained in paragraph 0 in Table 18.

Table 16 The middle layer - Risks	
Output risk	Explanation
Profit risk	Profit risk concerns the risk that the profit targets are not reached. This risk can either be caused by factors that have an impact on the operation costs or by factors that influence the sale volumes or the market price of the product/service.
Product /service risk (Workshop result)	This risk concerns the successfulness of the product. With successfulness it is meant whether the product is widely adopted in the market. Also risks regarding the quality of the product is an example of output risk.
Loss of resources	This risk concerns the fact that resources can get lost. A loss of an employee with valuable knowledge can be such a risk.
Process risk	Explanation
Spillover risk (B. Nooteboom, 2004)	This risk concerns the leakage of valuable information which the partner can use for economic purchases. The partner can do this without even having the privilege to do so from the company from whom it “steals” information. The partner can because it is not clearly visible that the information spills over to

	the partner. Through the cooperation the partner can learn and internalize the information.
Hold-up risk (B. Nooteboom, 2004)	This risk concerns the situation in which the partner does not make the needed investments that enhance the strategic value. For example investments that secure efficient and effective processes.
Reputation risk (B. Nooteboom, 2004)	This risk concerns the risk that one actor damages the reputation of the other. An example, the partner is responsible for the installation of the product and acts unfriendly towards the client during the installation procedures which can damage the reputation of the focal company who provides the installation service through the partner.
Interface risk (Workshop results)	This risk concerns the interface between the processes/resources of the organizations.
Competitor risk (workshop results)	This risk concerns the risk that the organizations become competitors instead of partners.

#### 6.4.3. Inner layer – Organizational governance structure

For a detailed explanation regarding the financial structure that underpins partly the organizational governance structures, see chapter 2.

As discussed in chapter 2, control mechanisms can be categorized as output, process, and social control mechanisms. Output control mechanisms are mechanisms that control the output performance. Process control mechanisms control the processes, i.e. the behavior of the actors. Social control mechanisms are very similar to output and process control mechanisms. The difference is that social control mechanisms are mechanisms that are designed by the involved actors together. The actors design the output and/or process control mechanisms together. Chapter 4 discussed the distinction between ex ante and ex post transaction costs. Based on this discussion it becomes clear that a distinction can be made between ex ante control mechanisms and ex post control mechanisms. Ex ante control mechanism control the ex ante decision phases and ex post control the operation phase

Thus, when decision-makers design control mechanisms they should recognize the differences between output, process, social, and ex ante versus ex post control mechanisms. Table 17 gives a few examples of control mechanisms..

Table 17 The inner layer –Organizational governance structure

Financial structure		
Hierarchical	Acquisition	
Hybrid	Equity alliance Non-equity alliance	
Market	Buyer-supplier contract	
Control mechanisms		
Output	Setting targets, Making a planning and budgets Escrow agreement Exclusivity agreement	Service level agreement* Partner selection*
Process	Determine policies and process procedures Staffing and training Incentive mechanisms	
Social	Contract negotiation process Participatory decision-making process	

\*Service level agreement and partner selection can cover both output and process control mechanisms.

### 6.5. Framework steps

Through 3 steps, decision-makers get a better understanding which aspects are relevant to consider and how to translate these aspects into an organizational governance structure that fits the context best. These steps are:

1. identify factor characteristics of the four categories: market, products and services, actors, and resources.
2. identify risks and categorize the risks in output and process risks.
3. design organizational governance structure by choosing a financial structure, control mechanisms, and type of trust

Figure 20 illustrates the logic behind the framework that provides guidance to go from step 1 to step 2 and from step 2 to step 3. The next paragraph the steps are explained in depth.

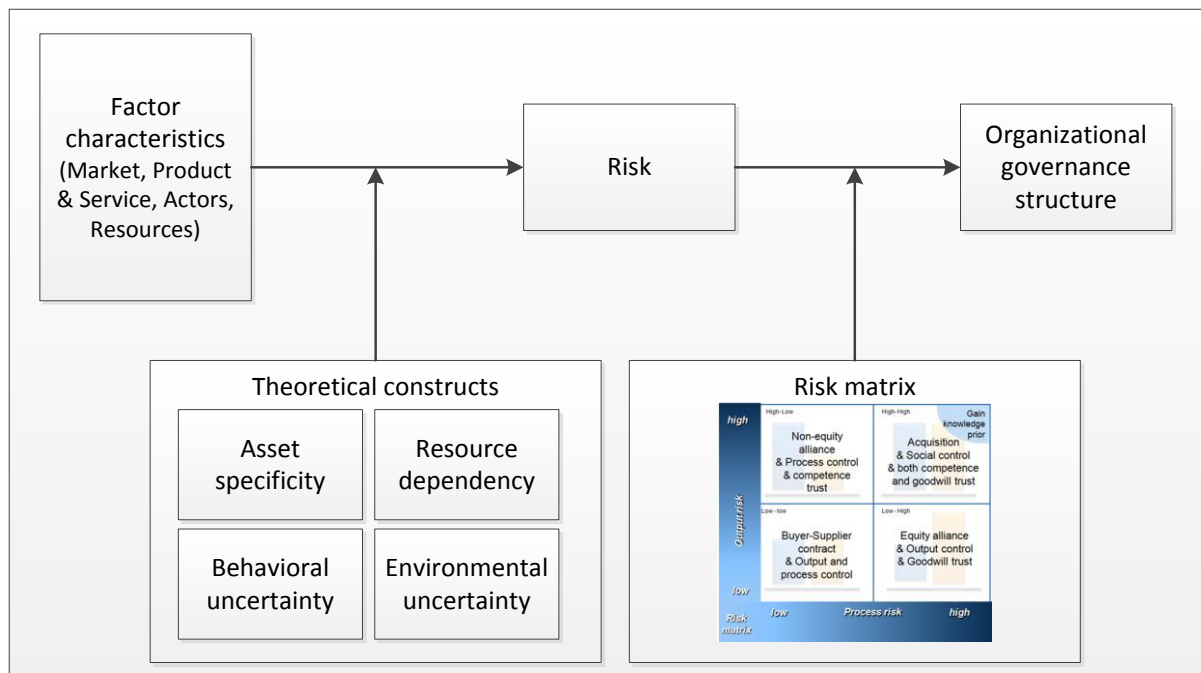


Figure 20 Logic behind the framework

### 6.5.1. From step 1 to step 2

Theoretical constructs derived from TCE and RBV aid decision-makers to translate factor characteristics into risks, however it should be noted that TCE and RBV do not explain all the risks that organizational relationships encounter. Table 18 gives an overview of how the risk analysis can be executed. The determinants of the theoretical constructs that are discussed in chapter 4 and in Appendix A in detail are also given in Table 18.



Table 18 Determinants of risk types

Risk category	Risk type	Theoretical construct	Explanation	Determinants of theoretical constructs of TCE and RBV <sup>21</sup>
Process risk	Hold-up risk	Partners opportunistic behavior (Behavioral uncertainty)	Where there is the opportunity to act opportunistically the partner can easily be triggered to under invest, and as a consequence that processes are not executed as productive as when the investments are made.	Size of the actors Product complexity Resource overlap Strategy overlap Resource dependency
		Dedicated, physical, and human asset specificity	The higher the asset specificity, the less likely the partner wants to invest, because it creates lock-in effects. The partner becomes more dependent than if there are no specific assets.	Costs made by the focal company in order to carry out the activities Degree of product customization Tacit knowledge of the employees of the partner
	Competitor risk	Partners opportunistic behavior	The greater the opportunity to act opportunistically, the more likely the partner is only concerned about its own value appropriation. This interest can encourage the partner to become a competitor instead of a partner.	Size of the actors Product complexity Resource overlap Strategy overlap Resource dependency
		Brand-name capital	The higher the brand-name capital, the more sensible the brand-name of the focal company. As discussed in appendix A, the customer interface influences the brand-name capital. When the partner has the customer interface, the partner is more encouraged to become a competitor instead of a partner.	Brand-name reputation of focal company Brand-name reputation of partner Customer interface
	Interface risk (between	Resource dependency	The more dependent the partners are, the greater the resources and processes of the involved actors are intertwined. Furthermore, it is assumed that the more	Resource richness (technical, commercial and financial resources) Strategic resources

<sup>21</sup> Appendix A explains the determinants of the theoretical constructs of TCE and RBV in detail

	partners)		the resources and processes are intertwined, the less likely the interface between the resources will be standard as a consequence that interface risks gets higher because the change that the interface guarantee a match between resources and process is little.	
		Number of partners (workshop result)	The consequences of this risk increases with the number of partners because the number of partners intensify the number of interfaces.	Number of partners
	Spillover risk (Lavie, 2006)	Partners opportunistic behavior	The greater the opportunity to act opportunistically the more likely the partner is only interested in its own value appropriation. If the information of the Vattenfall is valuable it can use this information for its own purposes.	Size of the actors Product complexity Resource overlap Strategy overlap Resource dependency
		Partners absorptive capacity	The higher the absorptive capacity, the higher the capability of the partner to learn and use the knowledge that leaks because of the collaboration in an economic matter.	
		Resource dependency from focal company perspective	The lower the resource dependency, the stronger the bargaining power of the focal company is.	Resource richness Strategic resources
Output risk	Product risk	Environmental uncertainties	The greater the uncertainties regarding the technological developments of the product, the higher the product risk. For that reason, it is difficult to determine the success of the product. It only will become clearer whether the product will become the dominant product over time. Thus co-developing a product in a context where the environmental uncertainties are high, the product risk increases.	High-technology characteristics Market maturity Product maturity Degree of competition Market complexity

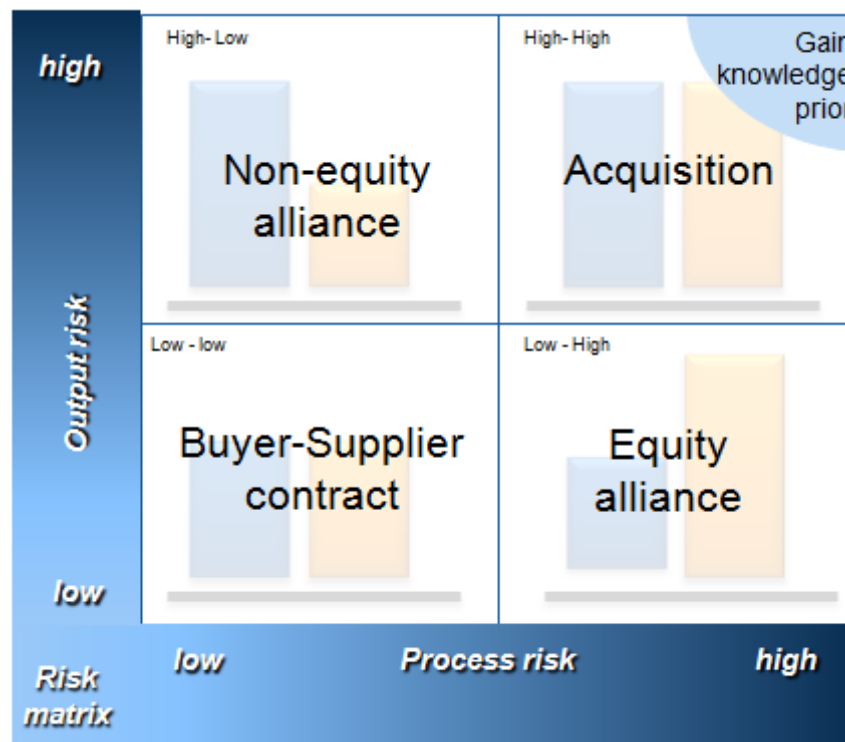
	Profit risk (Sales, Revenue, Operation costs)	Environmental uncertainty	It is assumed that when the degree of competition is high, the price of the product will decrease because the product is no longer exclusive.	High-technology characteristics Market maturity Product maturity Degree of competition Market complexity
		Product adoption	The higher the product adoption the greater the volume of sales. This limits the profit risk.	
	Loss of resources	Resource dependency from focal company perspective	When the focal company is highly dependent on the resources of the partner it is more vulnerable for the loss of the resources of its partner.	Resource richness (technical, commercial and financial resources) Strategic resources
		Physical and human asset specificity	When the resources of the partner are specific for the collaboration the loss of these resources cannot be easily replaced. Thus, the more specific the assets from the partner, the more difficult to find replacement.	Degree of product customization Costs made by the focal company in order to carry out the activities Tacit knowledge of the employees of the partner

### 6.5.2. From step 2 to step 3

A risk matrix is designed to provide guidance for the translation of risks into an organizational governance structure. The matrix illustrates how decision-makers can determine which financial structure in combination with control mechanisms and type of trust can underpin the organizational governance structure based on the perceived process and output risks. It also illustrates the dynamic in decision-making processes concerning organizational governance structures.

#### 6.5.2.1. Financial structure

Figure 21 illustrates the relation between the financial structure and the level of output and process risks.



**Figure 21 Risk matrix - financial structure**

Source: Williamsion (1979), Das (1996)

*The upper left corner – Non-equity alliance:*

In this corner environmental factors are mainly of great concern. It could be that the product is under development with high uncertainties regarding the developments because there is low availability of market and technical information. In other words, in this corner it is vital to cope with the dynamics in the markets that are unpredictable, and for that reason flexibility is desired. If the product and service no longer can be commercialized successfully, exit must be possible. Strategic flexibility is one of the characteristics of non-equity alliances (Das, 1996). There are no high exit costs related with non-equity alliance compared to equity alliance, and therefore they are flexible. Based on the need for flexibility and the high exist costs related to equity alliance, a non-equity alliance should be implemented for organizational relationships embedded in a risk context similar to this corner.

*The upper right corner – Acquisition:*

Both the output and process risks are high which make it difficult to define mechanisms that control the output and processes. To execute control an integrated relationship is recommended such as an acquisition. Due to complete ownership it becomes easier to execute control than when the organizations remain independent organizations and try to control each other with a complex contract (Williamson, 1979). Furthermore, it is reasonable to expect that a subsidiary and parent company cooperate better than independent organizations because the overall performance of the organization is in the interest of both. And finally, with complete ownership information asymmetry is reduced.

However, if the process and output risks are really high, it is better to question whether the desire to provide the product and service to market is appropriate. If the product and service have the potentials to increase the Vattenfall's strategic value proposition, it is recommended to gain knowledge prior the organizational relationship. Gaining knowledge prior to the organizational relationship reduces the risks perception because better mechanisms can be designed to guarantee the creation and appropriation of the values. This is explained in more detail in the next paragraph. If the process and output risks remain high, it is recommended to not form an organizational relationship.

*The lower left corner – Buyer-supplier contract:*

The output and process risks are low and for that reason it is easy to determine which mechanisms are needed to control the output and processes. In such situations there is no need to have a complex financial structure with equity. An arm length contract, or so to say, a buyer-supplier contract can be implemented where the output and process risk are low.

*The lower right corner – Equity alliance:*

In this corner the process risk is of greater concern than the output risk. In other words, the opportunity for, and intention to opportunistic behavior plays a vital role in this corner. To cope with this opportunistic behavior it is expected that equity alliances deal better with this opportunism than other financial structures. It is reasonable to expect that there is a smoother collaboration among organizations when equity is shared, than when there is no equity sharing at all. It is also reasonable to expect that organizations are less likely triggered to act opportunistic towards another when sharing equity (Das, 1996). Moreover as discussed in 2.4, through equity alliance the organizational relationship, and thus the partner, is controlled through financiers voting powers, access to information that reduce information asymmetry, and rights of control. To conclude, organizational relationships that are embedded in a risk context similar to this corner can be better managed and controlled through an equity alliance.

#### 6.5.2.2. Control mechanisms

The control mechanisms can be implemented in each corner of the risk matrix but the reliance on each type depends on the level and type of risk (Smith, 2008).

Necessary condition for process control is the understanding of the processes. Output control is most effective where there is little knowledge about the processes and where output measure can be

defined precisely (Das, 2001). Social control mechanisms are effective where both risks are high. They can mitigate both risks.

Figure 22 illustrates the relation between control mechanisms and the level of the output and process risks.

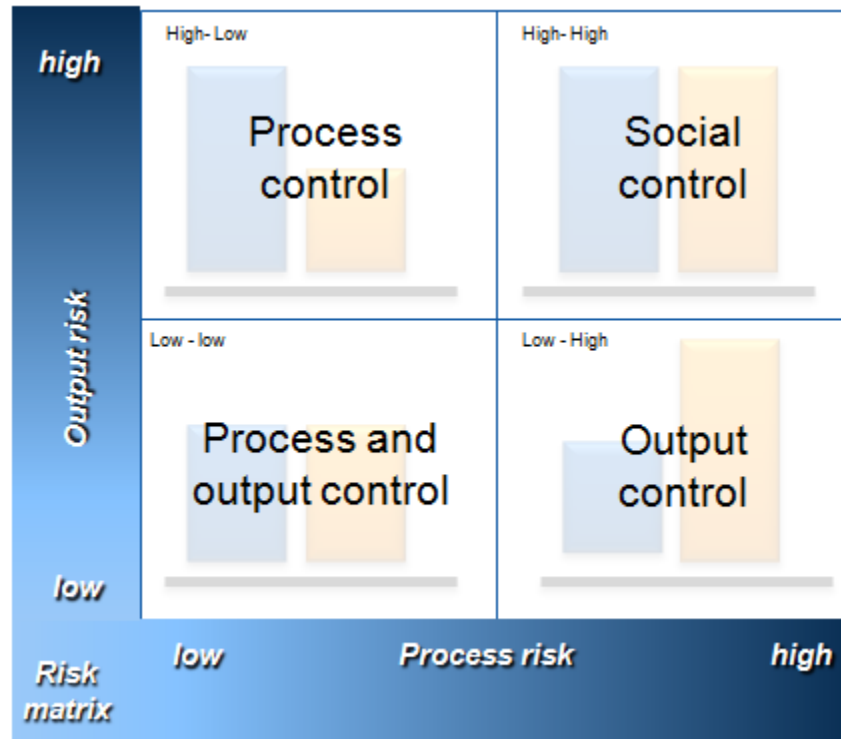


Figure 22 Risk matrix - control mechanisms

Source: Langfield-Smith (2008), Das (2001)

*The upper left – Process control:*

In this corner the focus should be on process control mechanisms rather than on output control mechanisms. The high output risk makes it hard to define control mechanisms that can measure the output precisely which is important. When the output or process cannot be measured precisely, the information that is gathered may mislead decision-makers to take wrong measures, which can lead to bad performances in the end. It is therefore important that organizational relationships embedded in a risk context similar to the upper left corner, to focus more on process control mechanisms than on output control mechanisms. Examples of process control are operating procedures or reporting structures.

*The upper right corner – Social control:*

This corner represents organizational relationships that are embedded in a context where both output and process risks are high. It is hard to define control mechanisms through which the outputs and processes can be controlled accurately, and therefore output and process control are not the main focus but social control mechanisms are. Social control mechanisms have a higher effectiveness than output and process control mechanisms in such a context. They create shared norms, values and beliefs which reduce the behavioral uncertainty, and thus the process risk. Social control mechanisms also reduce output risk because social control encourages the involved actors to do

their best to cope with environmental uncertainties (Smith, 2008). Example of social control mechanisms are participatory decision-making or participatory target setting.

*The lower left corner – Output and process control:*

Both output and process risks are low in this corner of the risk matrix. The low risks make it possible to define control mechanisms that measure the output and process precisely, and for that reason both output and control mechanisms should underpin the organizational governance structure.

*The lower right corner - Output control:*

For this corner, the same reasoning as the upper left corner counts. High process risk and low output risk indicate that output control mechanisms can be defined precisely, whereas the process control mechanisms not. Based on that, the focus should be mainly on output control mechanisms rather than on process control mechanisms. Examples of output control mechanisms are customer target or profit target.

### 6.5.2.3. Trust

As discussed in chapter 5, trust has various effects on decision-making processes concerning organizational governance structures. A complementary as well as substitute effect. Both are important effects to consider in the risk matrix. Furthermore, the distinction between goodwill and competence trust is also vital to incorporate. Figure 23 illustrates the relationships between the degree of risks and types of trust.

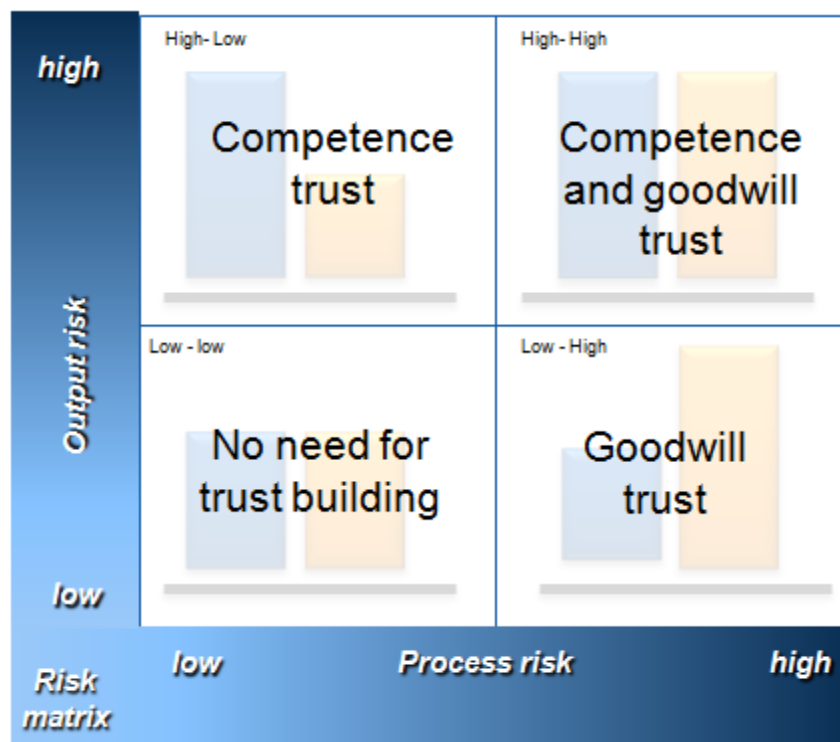


Figure 23 Risk matrix - trust

Source: Das (2001)

*The upper left corner – Competence trust:*

To deal with the high output risk, it is important to build competence trust. Through competence trust, organizations gain trust in each other's resources and capabilities, as a result that the output risk will be perceived as relatively low (T. K. Das, Teng, B.S., 2001).

*The upper right corner – Competence and goodwill trust:*

In this corner both risks are high, which is caused by the uncertainties regarding technical and market developments, as well as behavioral uncertainties. It is expected that innovation is necessary to cope with the high risk. Innovation processes require trust because trust has a positive effect on innovation performances. It fosters knowledge and ideas sharing. This information flow enhances innovation performances (Wang, 2011), and that reason the presence of both competence and goodwill trust is recommended.

*The lower left corner – No need for trust building:*

Trust is not considered in this corner because there it is not necessary to build trust in order to complement the control mechanisms. As mentioned in the previous paragraph, control mechanisms can be defined precisely. With these precise defined control mechanisms, partner's activities can be judged easily, and for that reason there is no need to build trust.

*The lower right corner – Goodwill trust:*

Goodwill trust can cope with high process risks. Through goodwill trust confidence in partner's good intention increases. As a result, a closer cooperation, a more open information exchange, and a deeper commitment between organizations will be established. These results reduce opportunism and process risks (T. K. Das, Teng, B.S., 2001).

#### 6.5.2.4. Complete control package as organizational governance structure

Previous paragraphs, 6.5.2.1 to 6.5.2.3, discussed the financial structure, control mechanisms, and type of trust separately. However, the essence of the organizational governance structure is the combination of financial structure, control mechanisms, and type of trust. These elements should complement and balance each other. Together they form the complete control package.

Figure 24 illustrates the combination of financial structure, control mechanisms, and type of trust within the risk matrix.



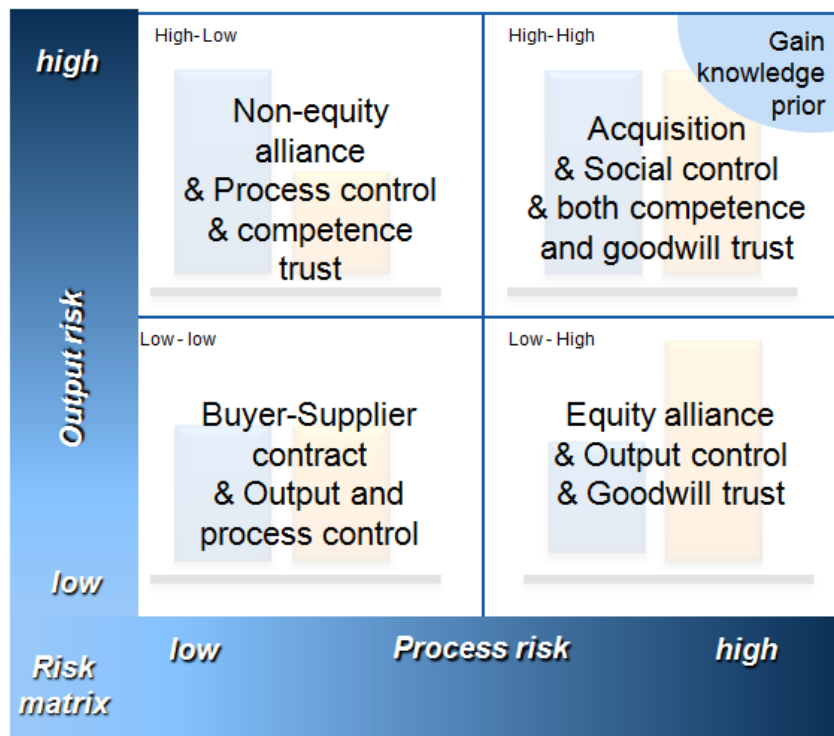


Figure 24 Risk matrix – financial structure, control mechanisms, and trust

Source: (Das, 1996; T. K. Das, Teng, B.S., 2001; Krishnan, 2006; Lui, 2004)

*The upper left –Non-equity alliance, Process control and Competence trust:*

The process control and competence trust complement and balance each other in the management and control of organizational relationships embedded in a risk context where output risk is high and process risk low. High competence trust can reduce the alertness among partners (Krishnan, 2006) and increase vulnerability to opportunism (Lui, 2004). To cope with these effects, there is a need for process control. The process control mechanisms, such as a protocol procedure and down punishment for opportunism, counter opportunism (Lui, 2004). Thus, process control and competence trust complement and balance each other. Non-equity alliance also strengthens this control package. The strategic flexibility provided by non-equity alliance is of great importance for organizational relationships embedded in this context where organizations face unpredictability.

*The upper right corner – Acquisition, Social control, and Competence as well as goodwill trust:*

Organizational relationships in this corner are better managed and controlled through complete ownership, social control mechanisms, and competence and goodwill trust. As discussed, hierarchical organizational governance structures shape the behavior which constraints the effects of trust. By combining hierarchical organizational governance structure with social mechanisms the effectiveness of trust improves, which is needed for innovation purposes. With social mechanisms openness and transparency is created, and as a result that trust is built through social mechanisms. Thus, with social control mechanisms the effect of trust improves. The other way around, “social control works best when there is a relative high level of trust” (T. K. Das, Teng, B.S., 2001). Thus, the combination between social control mechanisms and trust complement each other in their effectiveness. Since both risks are high and trust plays a central role, it is important to prevent the downside risk of trust,

overconfidence. With complete ownership balance can be created, because ownership gives complete rights to screen the information provided by the subsidiary.

*The lower left corner – Buyer-supplier contract and Output and process control:*

In this corner, the organizational relationship is strongly controlled through market forces, and output and process control mechanisms. Trust is not considered in this corner because it is not necessary to build trust in order to complement and balance the control mechanisms. The control mechanisms can be defined precisely, and for that reason there is no need to build trust. In addition, the formal control mechanisms that control the organizational relationship in this corner do not create a trust breeding environment, as discussed in paragraph 5.2.4. Thus, it is better not to rely on trust when it comes to controlling organizational relationships embedded in a risk context similar to this corner in the risk matrix.

*The lower right corner - Equity alliance, Output control and Goodwill trust:*

Both equity alliance and goodwill trust are capable to cope with opportunism. Either by authority and mutual hostage, that equity provides to investors to control the partner, or by creating goodwill trust that reduces the intention to act opportunistically. The output control complements and balances the equity alliance and goodwill trust, by also controlling the output and not only the processes. Furthermore, output control mechanisms and equity alliance can function as mechanisms to cope with the overconfidence problem related to trust.

The main focus of the control package is to have mechanisms that complement each other, and if possible intensify their effectiveness. But most importantly, it is taken into consideration that both output and process risks are controlled in a way in order to balance output and process control.

## 6.6. Dynamics in the risk matrix

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The organizational governance structure asks for adjustment or complete redesign over time due to the dynamic characteristic of decision-making processes concerning organizational governance structures. This dynamic is caused by changes in the factor characteristics, the in-house knowledge, and level of trust. Changes in the factor characteristics, in-house knowledge and level of trust change the risk perception, see Figure 25, and as a consequence that a different organizational governance structure becomes more appropriate for the new context in which the organizational relationship is embedded.

The changes in the factor characteristics can be caused by various reasons and should not be undermined. These changes can cause new risks or intensify other risks. To what extent the factor characteristics change the risks perception depends on the factors and the change.

The relation between knowledge and risks is discussed by Shahriari (2011). Based on Shahriari's discussion it is concluded that, the perceived level of risk depends also on the knowledge actors have about the product, service and processes. The more knowledge there is regarding the product and the service (output knowledge), the lower the output risk is perceived because the more output knowledge there is, the better output control mechanisms can be defined. The better the control mechanisms can be defined, the lower the risks are perceived. The same accounts for the process

risk. The more process knowledge there is, the better process control mechanisms can be defined, and as a consequence the process risks perception decreases. Thus, in-house knowledge reduces the risk perception and if there is no knowledge the risk will be perceived higher. Beside in-house knowledge, external resources such as consultants can provide knowledge as well.

Trust also reduces the risk perception as knowledge does. The higher the level of trust among the involved actors the lower the risk is perceived. As mentioned in paragraph 5.2.1. trust is divided into goodwill and competence trust. The higher the goodwill trust, the lower the process risk is perceived. The higher the competence trust, the lower the output risk.

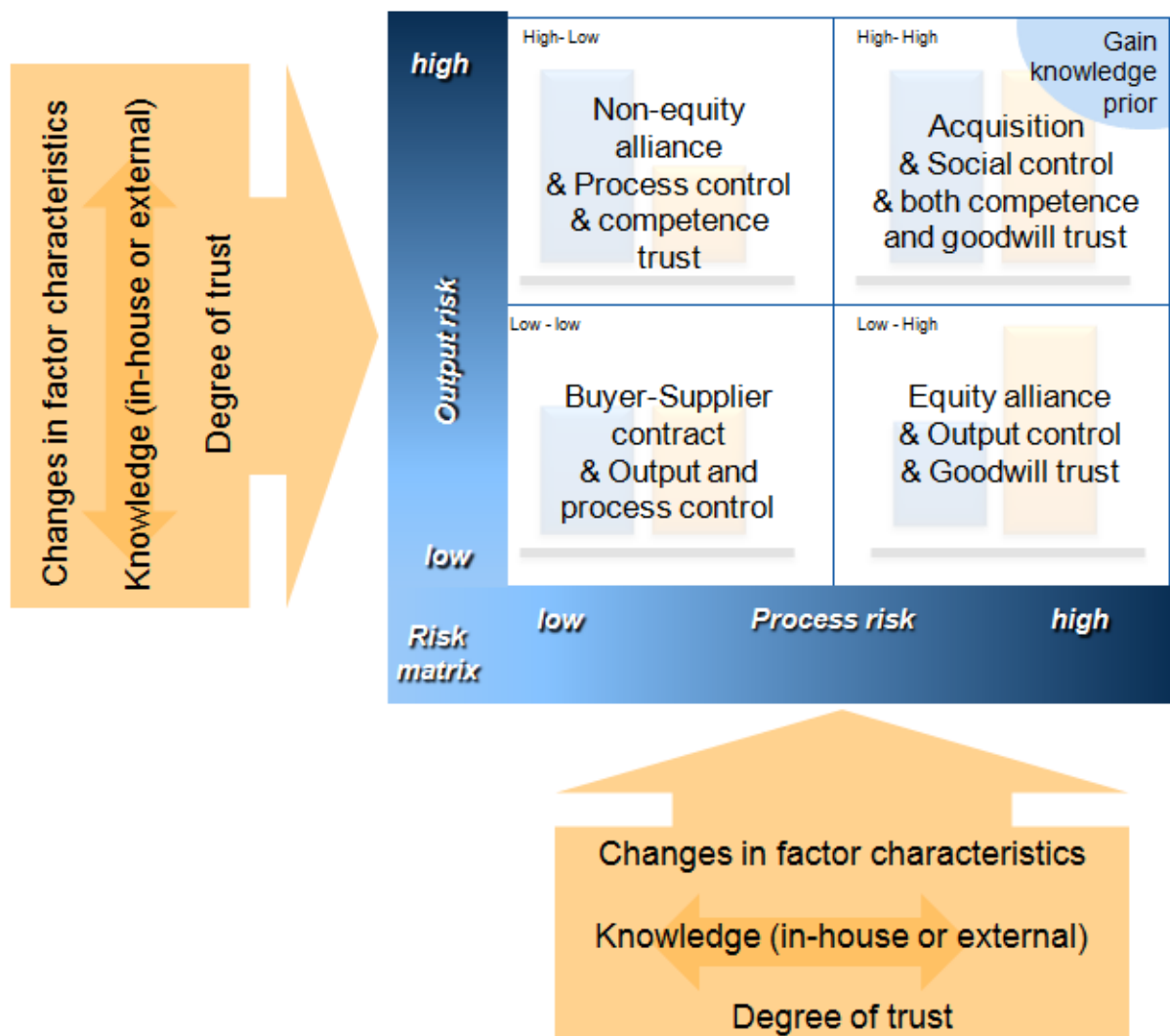


Figure 25 Dynamics in risk matrix

## 6.7. Concluding remarks

In this chapter the framework is designed based on the findings of the previous chapters. The design requirements are derived from the goals of this research, the preferences of decision-makers working at Vattenfall, and the characteristics of the decision-making processes. The design space consists of the aspects that are discussed in chapter 2 to 5, namely the elements that underpin

organizational governance structures, theoretical constructs of TCE and RBV that are useful to gain insights in management and control of organizational relationships, the four categories in which the factors can be categorized, and the type as well as level of trust that can establish among actors.

The framework is designed, based on the design requirements and the design space. The conceptual framework is demonstrated to several experts in Vattenfall and there feedback is considered to improve the decision framework.

Thus the answer to the sub-question; *How should the framework be designed?* is as follows:

The framework should consist of three layers. The outer layer consists of factor characteristics that need to be observed. There are four categories in which the factors are categorized: market, product and service, actors (partner or subsidiary), and resources. The middle layer consists of risks that organizational relationships face. These risks that accompany the relationship are identified based on the observed factor characteristics with the aid of theoretical constructs. The inner layer consists of the organizational governance structure that is underpinned by a financial structure in combination with different control mechanisms and type of trust.

A risk matrix is designed to support the framework. The risk matrix shows which financial structure, control mechanisms, and type of trust decision-makers should choose based on the level of risks they perceive.

The decision framework and risk matrix together simplify the complexity of the decisions by showing the steps along which decision-makers design an organizational governance structure..

## 7. Framework evaluation and application

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*With the decision framework designed in chapter 6, the decision-making processes concerning the organizational governance structure should be supported. Since decisions concerning the organizational governance structure are of strategic importance, it is crucial that the framework is tested on its content and logic. Furthermore, it is also important to stand still how the framework should be used within decision-making processes concerning organizational governance structures.*

### 7.1. Construct verification and limitations

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Before applying the decision framework, it is important to evaluate the final framework on its content and logic and prescriptive outcome. There are various testing procedures such as verification and validation. These procedures are independent and differ from each other. Verification focuses on the construct of the framework and tests whether the construct is logical. Validation, on the other hand, focuses whether the output of the framework represents the reality. The difference in focus makes verification and validation complementary to each other when it comes to testing. In this research only framework verification is conducted. The framework is not validated because there is not one particular organizational governance structure that can be implemented as mentioned in paragraph 6.2. This fact makes it impossible to test the outcome of the framework with an implemented organizational governance structure.

To verify the framework three experts within Vattenfall were asked to fill in the verification form. The verification form consists of several statements concerning the content and logic of the framework. Experts are asked to state to what extent they agree with statements regarding the content and the logic of the framework. A 7lickert-scale is used to measure the degree of agreement with the statement, see appendix D.

Based on the comments of the experts it can be concluded that the content and the logic of the framework are correct to a great extent but not completely. The following notable comments were made by the experts:

- The factor categories: market, product, partner, and resources are important factor categories to consider but the importance among these factors differ but there is not one factor category that is far more important than the others.
- The factor characteristics in the factor categories defined in this research do not cover all the factor characteristics that are important. For example key success factors fall within the market category which is not considered within the framework. Another example is the cost structure of the partner. It also matters to which extent the partner provides the resources and activities.
- Furthermore, there are also other factor categories which are not considered within the framework such as political factors and legal factors. These factors constraint or provide opportunities within organizational governance structures and for that reason it is also important to consider these factors during decision-making processes concerning organizational governance structures.

- The experts had some comments upon the statement that knowledge in-house influences the risk perception because knowledge can be gained through a third party, such as a consultant and does not need to be in-house by definition.
- Furthermore, little knowledge regarding the product and process does not lead to undesired outcomes or unsatisfactory processes. If decision-makers perceive a risk higher than the actual risk decision-makers can have also desired outcomes.
- The framework lacks illustrating the sequence between financial structures and control mechanisms. The choice for a financial structure limits the options within control mechanisms. When the financial structure is a buyer-supplier contract some control mechanisms cannot be implemented or are less effective whereas when the financial structure is a joint-venture these control mechanisms can be implemented and are highly effective.
- Finally, the framework can be perceived black and white while the reality is grey. It should be acknowledged that the framework is simplistic in the sense that it does not provide various organizational governance structures that are applicable for a certain context. A non-equity alliance can also provide a control environment that is comparable to an equity alliance.

Besides the comments of the experts it is also important that decision-makers take into account that the framework excludes the network effect of organizational networks upon the governance of these networks. Only bilateral organizational relationships are analyzed in this research. The complexity within the network is not considered within the framework and this limitation of the framework should be taken into account when the framework is applied in organizational networks. It should also be noted that the framework considers only one perspective, namely the perspective of the decision-makers and not from the other actors who are involved in the decision-making process. These limitations should be taken into account when decision-makers use the framework to support their decision-making process concerning organizational governance structures.

## 7.2. Framework application

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The framework designed has the ability to support decision-making processes concerning the organizational governance structure during various decision arenas despite of the limitations. To prevent confusions it must be acknowledged that the framework does not advice a particular organizational governance structure that needs to be implemented. The framework rather gives advice which aspects to consider and how to translate these into an organizational governance structure that is underpinned by a financial structure, different control mechanisms and type of trust. In other words, it provides guidance and suggestions regarding the organizational governance structure. The framework can be used to support ex ante and ex post decisions.

### *Ex ante and ex post*

Within ex ante decision arenas the framework can be applied to gain understanding in the context in which the organizational relationship is embedded. The risks that can accompany the organizational relationship can be identified and based on the fact that the design possibilities in the organizational governance structure (financial structure, different control mechanisms and type of trust) can be determined. Determining these design possibilities is valuable for the preparation of the negotiation process. The framework can also be used to identify only the characteristics of market and product

factors and accompanied risks in order to select a potential partner, who is capable of coping with the identified risks related to market and product factor characteristics. Hence, it is not needed to select the potential partner prior to using the framework, however, to make complete use of the framework it is better to consider the partner characteristics. When the partner is selected the characteristics of the partner and its resources can be considered in the analysis. Thus, the framework helps the decision-maker to understand before the partner selection and before the negotiation process takes place which risks it should strive to mitigate the risks. Either through selecting a partner who can cope with the risks or through an organizational governance structure that mitigates the risks.

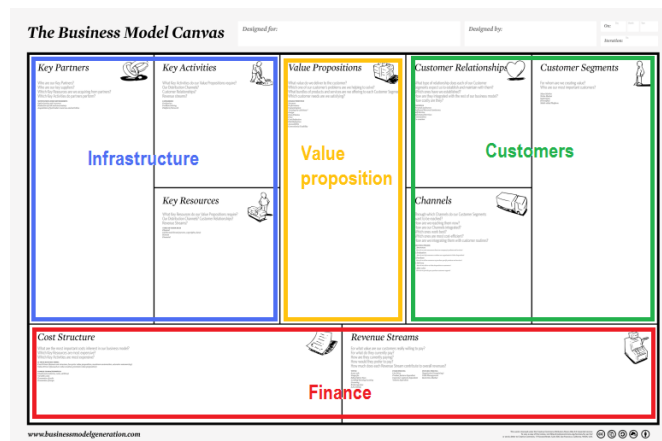
In the ex post decision arenas the framework helps decision-makers to update their perceptions regarding the risks that changes overtime due to changes in the context in which it is embedded as discussed in chapter 5 and 6. Updating is necessary to adjust the organizational governance structure to cope with the changes otherwise the organizational governance structure lacks coping with the risks which can lead to a decrease in business performances.

#### *Framework flexibility – Forward and backward engineering*

Besides the application of the framework within ex ante and ex post decision arenas it is important to notice that the steps of the framework can be executed in various ways. It is not necessary to walk the steps sequentially from one to three, i.e. go from the outer layer to the inner layer. It is also possible to go from the inner layer to the outer layer. Going from the outer layer to the inner layer is useful to design the organizational governance structure. Going from the inner layer to the outer layer (backward engineering) is useful to control whether the organizational governance structure really has the ability to mitigate the risks that accompany the factor characteristics that are present within an organizational relationship.

#### *Framework and complete overview for business expansion possibilities*

It must be acknowledged that the framework does not cover the complete overview concerning organizational relationships that are needed to expand Vattenfall's business through customer interfacing business in energy-related market successfully. The business model canvas of Osterwalder (2010) could be used to get a complete overview. The business model describes how value is created, delivered and appropriated. From the business model canvas this research focuses on the management and control of the infrastructure, e.g. activities, resources and the partner. It does not consider the formulation of the strategic value proposition, the customer segment and finances which are also important to get insights in the complete overview in order to commercialize energy-related products successfully, see Figure 26.



**Figure 26 Business model canvas (Osterwalder, 2010)**

Because this research does not cover the complete overview, the strategic value proposition should be defined before identifying the risks related to the factor characteristics and determining the organizational governance structure based on the risks. The reason to formulate the strategic value beforehand is to narrow the scope of the analysis. The importance is to mitigate the risks that threaten the creation and appropriation of the strategic value. Other risks can be left out of the analysis. However, it is good to notice to leave room for the partner to add his knowledge for the formulation of the strategic value proposition even though the strategic value proposition is formulated beforehand. With the knowledge of the partner it is possible to formulate a more strategic value proposition.

When the framework is used for evaluation purposes, it is primarily important to measure the performance indicators (output and process). If these are alarming than the evaluation is needed. The risks perception needs to be updated first, by analyzing the characteristics of factors and identifying the risks that are related to the characteristics. Secondly, whether the risks hamper or are a threat for the creation of the strategic value should be analyzed. If the risks identified do not harm the creation or appropriation of the strategic value than there is no urgency to adjust or redesign the organizational governance structure.

It is not necessary to define the customer and finance blocks to use the framework for determining or evaluating the organizational governance structure, even though the customer and finance blocks are also important to get the complete overview. As a matter of fact the customer and finance blocks should be negotiated parallel to the financial structure, control, and type of trust.

### 7.3. Concluding remarks

*How should decision-makers use the framework?* is the central sub-question of this chapter.

Before answering this question it is important to verify the content and the logic of the framework. These are verified through a survey that consists of statements which emphasize the content and the logic of the framework. Based on the results of the survey, it is concluded that the content and the logic of the framework are correct to a great extent. The factor categories are useful but the framework does not consider all the relevant factors within these categories. The framework lacks



illustrating the sequence between financial structures and control mechanisms. An interesting comment was made regarding the statement that knowledge in-house influences the risk perception because knowledge can be gained through a third party, such as a consultant and does not need to be in-house by definition. Finally, the framework could be perceived completely black and white while reality it is rather grey.

Despite of these limitations the framework can still support decision-making processes concerning organizational governance structures through various ways.

The framework provides insights:

- in the aspect that are relevant to consider
- how to translate these aspects into an organizational governance structure that is underpinned by a financial structure, different control mechanisms and type of trust.

The framework can also be used to evaluate the organizational governance structure. In other words, control whether the organizational governance structure can cope with the risks the organizational relationship encounters.

If decision-makers use the framework, they should be aware that the complete overview is not covered by the framework, and for that reason decision makers should incorporate the strategic value in order to design the organizational governance structure. Performance indicators should be used when the framework is used to evaluate organizational governance structures in order to narrow down the scope of analysis.

Figure 27 gives an overview of how the decision-making process, decision framework, theoretical constructs of TCE and RBV, and risk matrix are related to each other.

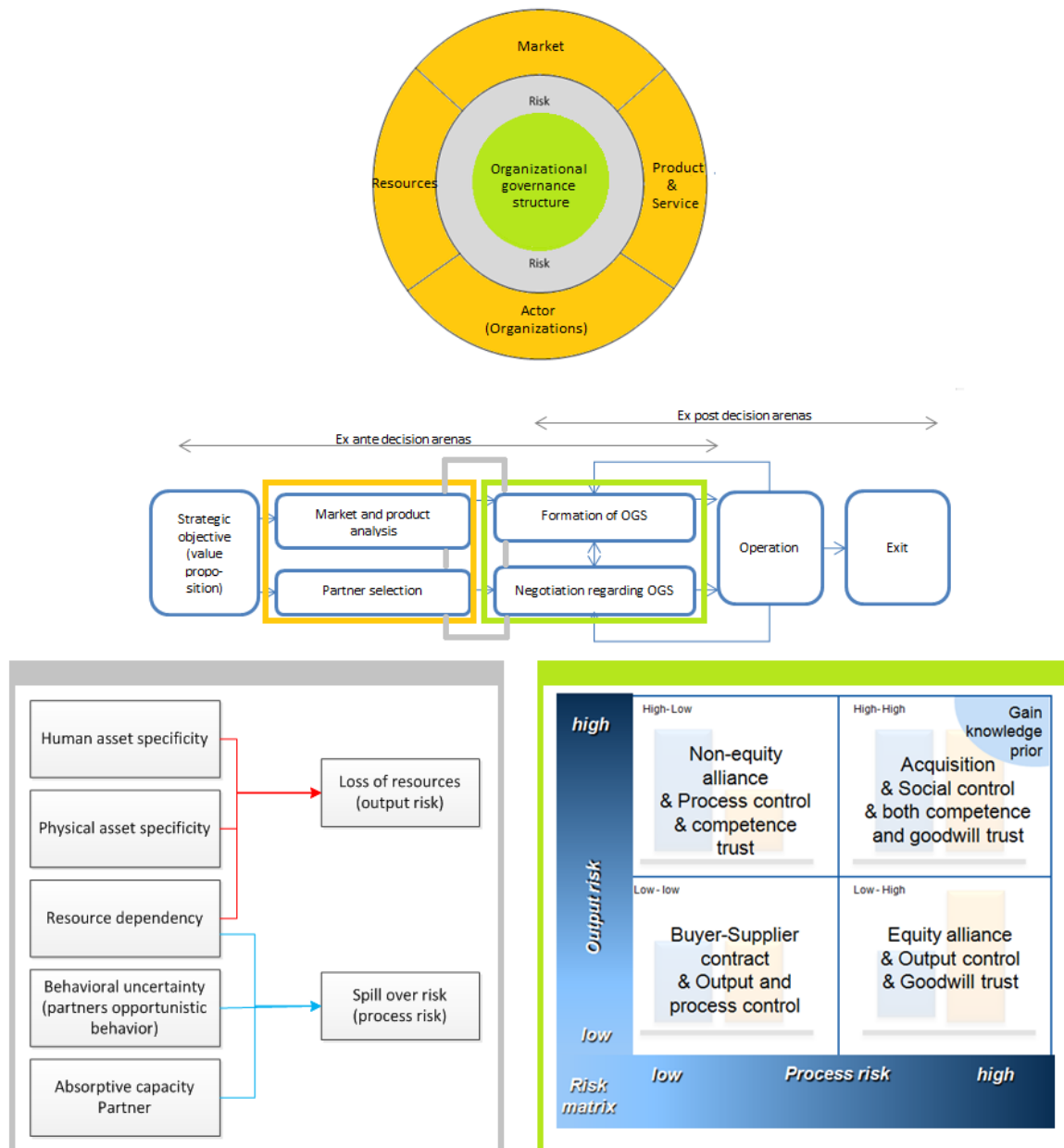


Figure 27 Application of the framework

# PHASE III

## Conclusion, reflection & recommendations

Chapter 8: Conclusions and practical recommendations

Chapter 9: Reflection and further research recommendations



## 8. Conclusion and practical recommendations

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*This chapter gives an overview of the results of the research. Decision-making process for organizational governance structures are the focus of this research. Designing an appropriate organizational governance structure is of high strategic importance because if they do not fit in the context in which they are embedded success is hampered or the resources of the organization are overstretched. They have impact on day-to-day business on the short term or even impact on overall company performance in the longer term, and for that reason accurate decisions should be taken.*

*The main research question is:*

*Which aspects should be considered in a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets?*

*This research question is further divided into sixths sub-questions which are discussed in the following paragraphs. Paragraph 8.9 provides recommendations for Vattenfall.*

### 8.1. Organizational governance structures

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The first sub-question is: *What is the purpose of organizational governance structures and what underpins organizational governance structures?*

The purpose of the organizational governance structure is to structure, manage and control inter- and intra-organizational relationships. Organizations agree on the division of labor and the responsibilities they take, but also on how to manage and control the risks that face the organizational relationships. Controlling the risks is important in order to achieve the desired opportunities that are created through the organizational relationships.

Designing the appropriate organizational governance structure is challenging due to the diversity in elements that underpin organizational governance structures. Organizational governance structures are underpinned by contract types, financial structures, and control mechanisms. The combination within and between these elements intensify the variety within organizational governance structures.

In this research the financial structure and control mechanisms that underpin organizational governance structure are considered next to the types of trust, which is discussed in paragraph 0.

### 8.2. Applied theoretical constructs

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It is necessary to review literature in order to gain a better understanding regarding the decision-making process concerning organizational governance structures. The second sub-question is: *Which theoretical constructs should be considered to analyze organizational governance structures?*

Theories applied in literature to analyze organizational relationships and the management of them differ in their perspective. Some theories analyze the organizational governance structure from an

economic perspective, whereas others from an organizational or social perspective. From these theories, TCE has emerged as the dominant theory for analyzing governance structures. However, TCE has some limitations. To cope with these limitations and to create a more holistic view, the TCE is extended with RBV in this research based on theoretical calls.

The motivation of this research is the need for sourcing new activities and resources through organizational relationships in downstream customer interfacing businesses in order to create new competitive advantages. From a practical perspective, the applied theories should provide insights in competitive advantage, which RBV also does. To get more insights from a resource perspective, RBV is extended with the reasoning of the resource dependency theory (RDT).

By combining these theories, organizational governance structures are analyzed from an external and internal perspective. Moreover, from a cost-efficiency, value creation, and competitive advantage perspective.

From TCE and RBV with the extension of RDT, the following theoretical constructs of TCE and RBV provide valuable insights in organizational relationships: asset specificity, behavioral uncertainty, environmental uncertainty, and resource dependency. These construct are especially operationalized for organizational relationships in customer interfacing business in energy-related markets.

### 8.3. Organizational relationships in practice

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Two organizational relationships between Vattenfall and energy-related companies are analyzed. Through the case study analysis insights are gained whether TCE and RBV provide enough information for the design of a framework. The third sub-question is: *Are TCE and RBV useful theories to analyze the governance of organizational relationships between Vattenfall and energy-related companies?*

TCE and RBV are both theories that provide valuable insights regarding the choice for an organizational governance structure from an economic perspective.

However, it became clear that not all theoretical constructs of TCE are equally important to consider. Human asset specificity, dedicated asset specificity and brand-name capital are the most common ones to consider. Some energy-related products and services are still under-development, and require knowledge and investments in order to develop. For that reason, human- and dedicated asset specificity are common. Brand-name capital is also common because it is crucial to have a good brand-name reputation in order to attract clients for new downstream customer interfacing businesses. This does not mean that other types of asset specificity such as temporal asset specificity do not matter, but these are less common in various cases compared to human asset specificity, dedicated asset specificity and brand-name capital.

RBV elaborates mainly on the relation between strategic resources and the business performances or the competitive advantage of organizations. But RBV does not provide insight in which resources are valuable in organizational relationships between energy companies and energy-related companies.

Cases within Vattenfall give a clear overview which resources are valuable to analyze in organizational relationships between energy companies and energy-related companies. These are: technical, commercial, and financial resources.

Besides trying to verify theoretical constructs in practice, it became clear that the relevant factor characteristics can be categorized in four categories. These categories are: market, product and service, actors, and resources in exchange. From the factor characteristics, product maturity showed a strong relation with the choice for a type of financial structure. The more mature the product, the less hierarchical the financial structure.

Even though TCE and RBV are useful, both theories are not capable to explain the decision-making processes on itself and the choice for an organizational governance structure completely. The case studies illustrate that corporate strategy, trust, and the bandwagon effect also influence the choice for an organizational governance structure. Another remark is the path dependency that is subject to the design of organizational governance structures.

#### 8.4. Decision-making processes

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TCE and RBV do not include decisions-making processes. Sub-question four focuses on the decision-making process and is formulated as follows:

*What are the characteristics of decision-making processes concerning organizational governance structure and how do these characteristics affect the decision-making process?*

Decision-making processes concerning organizational governance structures are complex for three reasons:

First, the decision-making processes concerning organizational governance structures take places in multi-actor settings. In inter-organizational relationships the involved actors are the organizations and various departments of the organizations. In intra-organizational relationships the actors are only the departments of the organizations. These actors are interdependent. They have different goals and interests, which cause a lack of uniformity. This lack of uniformity among actors limits the span of control of an actor and makes joint decisions more difficult must all actors need to agree on the decision.

Second, the decision-making process concerning organizational governance structures is process-based and consists of various ex ante and ex post decision arenas. The decision-making process is a process that starts from the negotiation process prior to the collaboration, and continues during the operation phase of the product and service, till the end of the organizational relationship. The context, or so to say, the process and output risks that face the organizational relationship can change over time, which may require adjustments or even a complete redesign of the organizational governance structures.

Third, there are various decision arenas. The lack of a specific order in decision arenas, the iteration among these decision arenas, and their impact on each other make the decision-making process complex.

This complexity limits the support opportunities of the framework. The framework cannot advice a single organizational governance structure that lasts till the end of the organizational relationship.

The multi-actor setting does not only cause the complexity of decision-making processes concerning organizational governance structures. Decisions embedded in multi-actor are also embedded in a social system. In literature the social factor trust and its effect are discussed. Trust either complements or substitute elements that underpin organizational governance structures or trust influences the dynamic in decision-making processes concerning organizational governance structures.

### 8.5. Framework Design

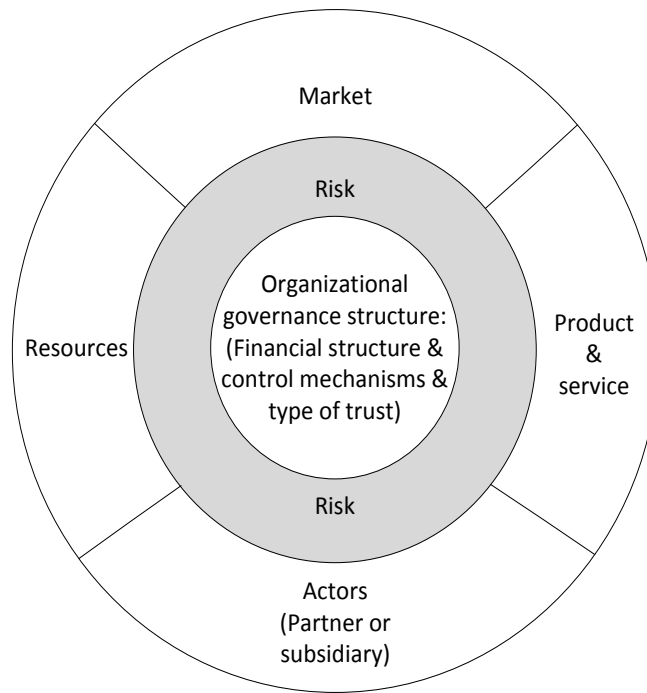
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The objective of this research is to design a decision framework which is the focus of sub-question five: *How should the framework be designed?*

The framework is designed along several steps that are based on the META-model (Herder and Stikkelman, 2004) and the design science research (Peffer, 2004). The first step is the identification of the design requirements. These derive from the research objective, decision-makers preferences regarding advice, and the characteristics of the decision-making. The design space is identified parallel to the identification of the design requirements. With the design requirements and the design space, a framework is designed. The conceptual design is demonstrated and evaluated with a workshop. With the results of the workshop the conceptual framework is refined.

The result of this design approach is a decision framework that consists of three layers as illustrated in Figure 28.





**Figure 28 Decision framework**

The outer layer illustrates the four categories in which the factors are categorized such as market, product and service, actors, and resources. The middle layer illustrates the risks that accompany the organizational relationships, such as profit risk or loss of resources. The inner layer contains the financial structure, control mechanisms, and type of trust that underpin the organizational governance structure.

Through three steps the decision framework provides insights in the design of organizational governance structures. The steps are:

1. identify factor characteristics of the four categories: market, products and services, actors and resources.
2. identify risks and categorize the risks in output and process risks.
3. design organizational governance structure by choosing a financial structure, control mechanisms, and type of trust.

To aid decision-makers to translate risks into an organizational governance structure, a risk matrix is designed. As shown in Figure 29, this risk matrix identifies the preferred financial structure, control mechanisms, and type of trust based on the risk perception.

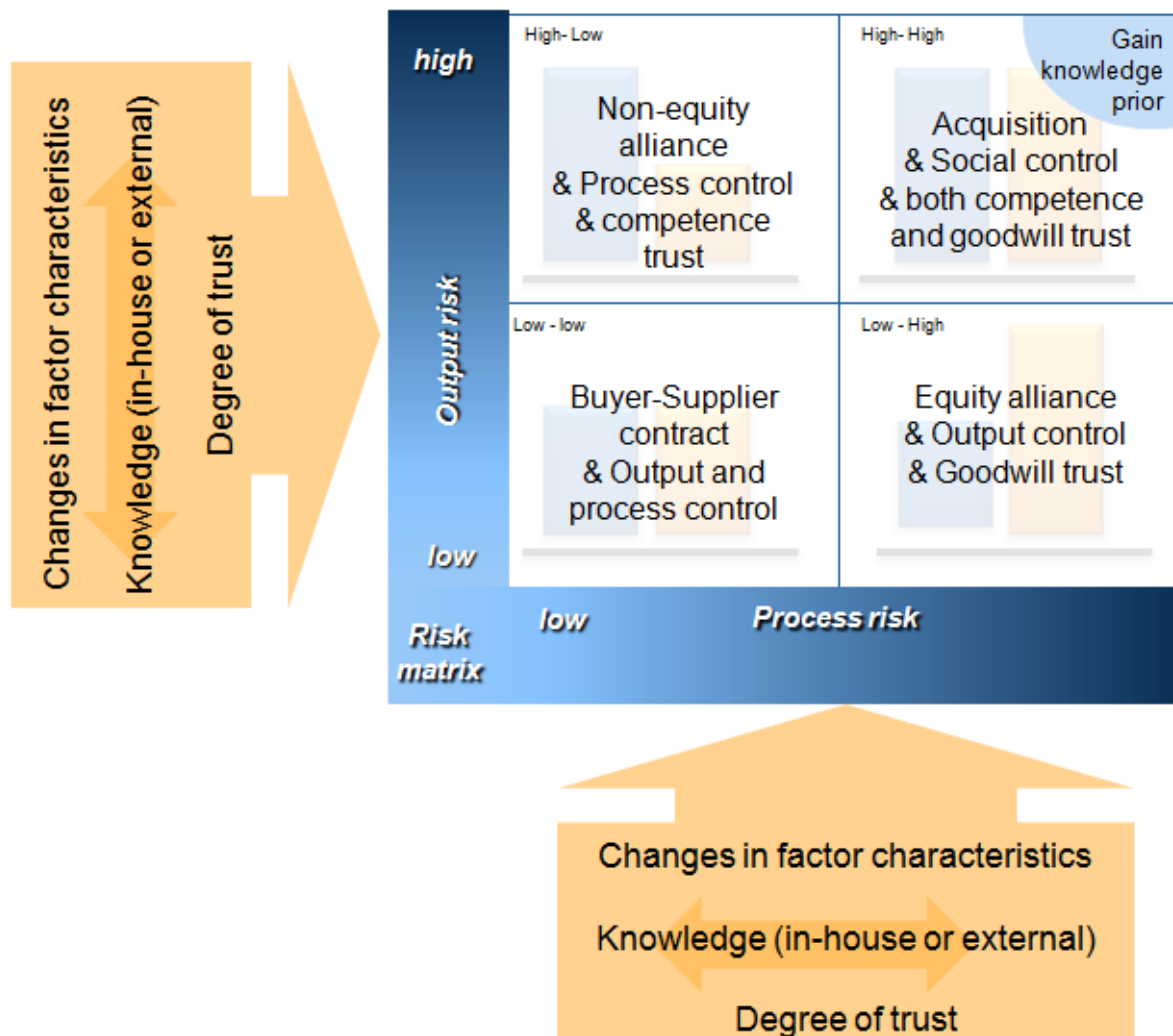


Figure 29 Risk matrix with the dynamic

Main conclusions from the risk matrix are:

- When both risks are high an acquisition in combination with social mechanisms and all types of trust is preferred. In high risk circumstances control is desired but at the same time trust because innovations require trust. Trust has a positive effect on innovation performances and innovation is needed to cope with the high risks. Acquisitions provide the most control compared to the other financial structures and for that reason an acquisition is preferred. Trust on the other hand reduces when the organizational governance structure is only control-based. To simulate the development of trust social control mechanisms should be implemented. However if the process and output risks are really high, it is better to question whether the desire to provide the product and service to market is appropriate. If the product and service have the potentials to increase the Vattenfall's strategic value proposition, it is recommended to gain knowledge prior the organizational relationship.
- When the output risk is the main concern a non-equity alliance in combination with process control and competence trust is preferred. It is important to have flexibility to end organizational relationships when environmental uncertainties, such as uncertainties

regarding technological developments, are high. The process control mechanisms and competence trusts are the mechanisms to steer the partner in the right direction.

- When the process risk is the main concern an equity alliance in combination with output control and goodwill trust is preferred. Through equity, mutual hostage is created which reduces behavioral uncertainties. Furthermore, equity alliances give access to control which is needed to control the behavior of the partner. With goodwill trust behavioral uncertainties can be further reduced. While equity alliance and goodwill trust mainly cope with the behavioral uncertainties, it remains important to control the output and for that reason output control mechanisms are also preferred in this context.
- When both risks are low a buyer-supplier relationship in combination with process and output control mechanisms is preferred. Trust is not needed since the organizational relationship can be fully controlled by the control mechanisms. The control mechanisms can be defined precisely since the risks are low, and the knowledge regarding the risks is available.

The risk matrix also illustrates the dynamic that is caused by changes in factor characteristics, the knowledge in-house or the capabilities to get the knowledge through external resources, and the degree of trust among the actors. By considering this dynamic, it gets understandable why organizational governance structures need to be adjusted or redesigned over time.

## 8.6. Framework application

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The sixth sub-questions concerns the ability of the framework to support decision-making processes concerning organizational governance structure and how. The sixth sub-question is formulated as: *How should decision-makers use the framework?*

The decision framework can support decision-makers, but decision-makers should be aware of the limitations of the framework before using it.

Important limitations that decision-makers should be aware of are:

- besides the four categories, political factors and regulation should not be forgotten
- the framework does not show that various organizational governance structures can be implemented for an organizational relationship
- the framework does not consider the complete overview for business opportunities

Despite the limitations, decision-makers can still use the framework for both ex ante and ex post decision arenas.

In the ex post decision arenas decision-makers can use the framework to gain a better understanding of the market, product-, actor- (partner) and resource characteristics that are present. Based on factor characteristics the risks that accompany organizational relationships can be identified. Eventually the decision-makers can design an organizational governance structure by choosing a financial structure, different control mechanisms and a type of trust that can possibly be implemented. Possibly implemented, because the other involved actors influence the decision-making process as well which are not considered in the framework. But by identifying possible risks

and an organizational governance structure that possibly can be implemented, decision-makers can prepare their selves for the negotiation process with the partner.

The framework is also useful during ex post decision arenas to cope with the limitation to identify all the risks beforehand and to cope with changes in the context. These changes can cause new risks or intensify other risks. Decision-makers must, for that reason, evaluate the organizational governance structure in order to get aware if there is a need for adjustments or even a complete redesign to cope with the new risk context.

The steps of the framework do not have to be executed always from step 1 to 3. Backward engineering is also possible. Backward engineering is especially useful to evaluate organizational governance structures.

Since the framework does not provide the complete overview for business opportunities, it is advised that the strategic value proposition is determined prior to using the framework for the formulation of organizational governance structures. For the evaluation, it is advised to control the performance indicators prior.

## 8.7. Conclusion

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The findings and answers related to the sub-questions provide the information to answer the main research question:

*Which aspects should be considered in a framework for the support of decision-making processes concerning organizational governance structures for downstream customer interfacing businesses in energy-related markets?*

Before designing the framework the complexity in decision-making processes concerning organizational governance structures should be noted. This complexity is caused by various reasons:

- There is a wide variety within organizational governance structures that are difficult to delineate due to the variety in elements and the combination among these elements
- A variety of relevant factor characteristics that need to be considered during the decision-making processes.
- Decision-making process concerning organizational governance structure takes place in multi-actor settings, and as a consequence that a joint decisions should be taken.
- Decision concerning organizational governance structures are not taken at a certain moment in time but along the organizational relationship life cycle.
- The decision making process is a process that consists of various decision arenas, where the topic differs, where there is no specific order, and where there is interaction among decision arenas.

This complexity poses that the designed framework cannot recommend a particular organizational governance structure. The uniqueness of cases make it impossible to design a framework that considers all factor characteristics that are applicable for all cases, and for that reason the framework is rather abstract than concrete in order to be generic and not specific.

The following aspects are relevant to consider in the framework, based on a desk research and case study analysis:

- The variety in elements that underpin organizational governance structures (financial structures, control mechanisms, and the type of trust)
- The four categories in which the factor characteristics are categorized
- The different types of risks
- The relations among the above three aspects (factors, risks, and the elements that underpin organizational governance structures)
- The dynamic in the decision-making process

Based on these aspects a decision framework, consisting of three layers, is designed. The framework gives a quick overview regarding the aspects that need to be considered and the relation among them:

- The outer layer contains factor characteristics in the four defined categories
- The middle layer contains risks
- The inner layer contains the financial structures, different control mechanisms, and types of trust.

The decision framework is supported by a risk matrix. Based on the risk context an organizational governance structure is given as the preferred structure. The dynamic in such decisions is considered by introducing the effect of the degree of trust, the changes in the factor characteristics, and knowledge to understand the risks, in the risk matrix. This dynamic ensures that the risk perception changes along the changes in the context, which is crucial. Organizational governance structures should be capable to cope with changes, either through little adjustments in control mechanisms or a complete redesign.

The framework frames the complexity in a simplified way. It guides decision-makers by showing which steps should be taken during the decision-making process. Decision-makers are shown to identify the relevant factor characteristics and translate these into an organizational governance structure. Besides designing organizational governance structures, the framework is also suitable for evaluation purposes.

Other key findings regarding the management and control of organizational relationships are:

- From the factor characteristics the factor '*product maturity*' clearly illustrated to play a vital role in type of financial structure. The more mature the product, the less hierarchical the financial structure.
- Organizational relationships create *resource dependency*. Based on the case study analysis and workshop, it can be concluded that Vattenfall is mostly depended on the technical resources of the partner. The partner, on the other hand, on Vattenfall's commercial resources. In some cases they are mutually dependent but quite often a disproportionate relationship is present. The dependency from Vattenfall is more serious especially when the technical resources of the partners are more strategic than the commercial resources of Vattenfall.

- Organizational relationships also create *path dependency*. This path dependency makes it difficult to adjust or to redesign the organizational governance structure. It is impossible to start with a blank sheet when formulating the new organizational governance structure.
- Decision concerning organizational governance structures can deviate from the organizational governance structure that is preferred by the risk matrix. Organizational governance structures in practice can deviate from the preferred due to corporate strategies and the bandwagon effect.

The scientific contribution of this research is the link between the research fields regarding organizational management and decision-making processes in multi-actor setting. In chapter 9, the scientific relevance of this research is discussed in more depth.

## 8.8. Practical recommendations

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This research is conducted for Vattenfall to design a framework that support their decision-making processes concerning organizational governance structures for downstream customer interfacing businesses within energy-related markets. This paragraph provides recommendations to Vattenfall based on the findings of this research.

- Each case is unique due the diversity in products and services. Products and services are either standard as well as well-developed to completely new as well as under development products and services. Or labor intensive versus knowledge intensive products and services. Based on the uniqueness of the cases, it is recommended not to use an organizational governance structure for various cases because there is no generic organizational governance structure that can be implemented to various cases. Each case should be analyzed independently and the organizational governance structure should be designed based on the specific case characteristics in order to design an appropriate structure.
- Appropriate organizational governance structures are needed in order to create and appropriate values through the organizational relationships. The decision framework and the risk matrix provide the preferred organizational governance structure, however it is possible to deviate. When deviation is considered, it is vital to acknowledge that a certain organizational governance structure can handle a certain degree of output and process risks. If decision-makers decide to deviate from the advised organizational governance structure, an analysis must be performed to determine if the deviation between the level of risks, and the level of risks that are governed by the chosen organizational governance structure, is acceptable. Extra costs for later adjustments in the organizational governance structure or financial losses might be prevented by this analysis. Or decision-makers should analyze if the deviation is possible due to the implementation of some measures, such as process standardization that may reduce process risks
- When it comes to the design of organizational governance structures, it is important to note the resource dependency that is created by organizational relationships. This resource dependency can lead to a lock-in effect, which can intensified by the organizational governance structure. The path dependency, which is also created, can intensify the lock-in

effect further. To prevent from getting locked in an organizational relationship, it is vital that decision-makers design the primary organizational governance structure in such a way that exit options, without great financial losses or other hurdles, are created.

- Continuous evaluation of the organizational governance structure is recommended to cope with the dynamic that is present in the management and control of organizational relationships. Since the energy- and energy related markets are dynamic, it is highly recommended to execute evaluation processes regularly. During the evaluation processes, if needed, adjustments should be made or a complete redesign should be considered when the organizational governance structure no longer is appropriate.
- Since decision-making processes concerning organizational governance structures are complex, it is recommended to have a standardized approach and to create a common language among employees. A common language among employees can stimulate knowledge sharing and learning amongst employees. And this knowledge sharing and learning helps Vattenfall to get a better understanding in the management and control of organizational relationships and improve their decision-making processes. The decision framework can be used to not only to make employees aware of the aspects that need to be considered, but it can also be used to create a common languages among employees and give impulse to knowledge sharing and learning.
- Finally, to further strengthen the support capability of the framework, it is recommended to extent the content of the framework by identifying a list of risks and control mechanisms. Employees within Vattenfall that work on daily basis with the management and control of organizational relationships can add their experience and knowledge in the framework. Organizing periodical meetings amongst experts within Vattenfall from all the departments that are involved in these decision-making processes will strengthen the support capability of the framework. The subject in these meeting must be the extension of the content of the framework.





## 9. Reflection and further research recommendations

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*This final chapter reflects on the research approach and design, research result, and the scientific relevance of this research. First, the research approach together with the design approach is reflected. Second, the final result is reflected. Along the reflection of the research approach and the final result, the applied research fields are discussed. Especially their contribution to the research and the final result. And finally, further research recommendations that can strengthen the decision framework are given.*

### 9.1. Research approach and design

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#### *Research approach*

To structure the research, it is divided into three phases. Phase I: *Theory and practice* concentrates on gaining knowledge from literature and practice regarding the topic. This phase can be divided into two parts. Part 1 of phase I focuses on the aspects that need to be considered during the decision-making process (chapters 2, 3 and 4), and part 2 on the characteristics of decision-making processes (chapters 5).

#### *Main contribution of part 1 of phase 1*

In part 1 of phase I, the research field regarding organizational management stands central. Especially the theoretical discussion regarding the control of risks that accompany organizational relationship, and TCE and RBV. The latter is also extended with the reasoning of RDT. These theories are chosen to gain a better understanding regarding the aspects that need to be considered during the decision-making processes. These theories are chosen because creating competitive advantage through the organizational relationship is the primarily goal. TCE analyzes the topic from a cost-efficiency perspective and RBV from a resource perspective. These perspectives together provide the ingredients to create competitive advantage.

As concluded in previous chapter, the empirical research has made it clear that certain factor characteristics need to be considered. Factors characteristics can be categorized in four categories: market, product and service, actors, and resources. Moreover, cases are unique which explains the unequal relevance of the measurement criteria that operationalize TCE and RBV. For example, temporal asset specificity is not of great importance in case 1 but in case 2 it is

It also became clear that TCE and RBV do not provide enough insights how decisions actually take place. The goal to create competitive advantage through organizational relationships is not only important to consider when designing a framework. The decision-making process on itself is also important. The research field regarding decision-making processes from de Bruijn (2008) is for that reason considered in this research next to the economic theories TCE and RBV.

#### *Main contribution of part 2 of phase 1*

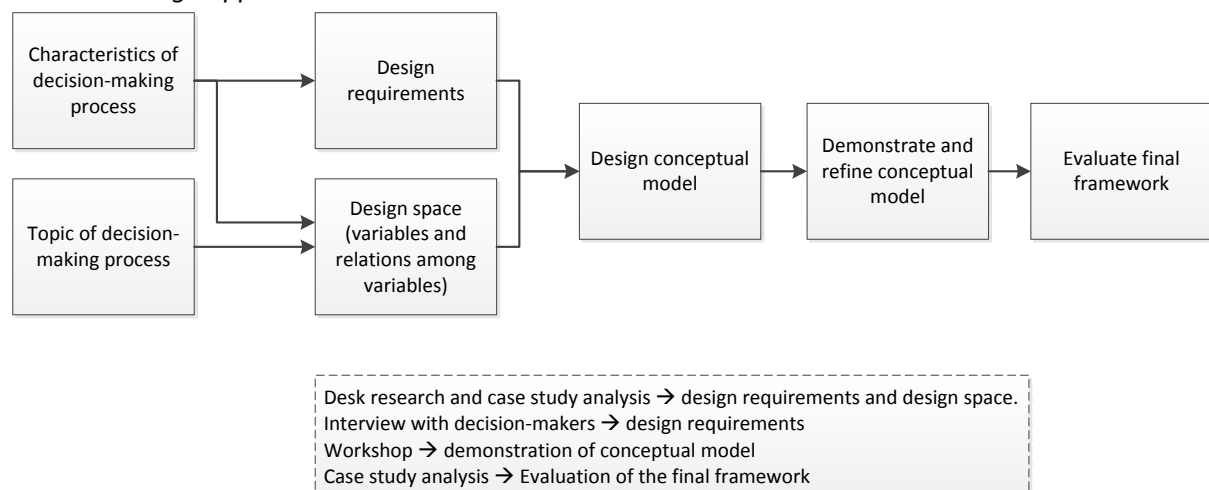
In part 2 of phase I, the research field regarding decision-making processes in multi-actor setting is central. By analyzing the topic through the characteristics of the decision-making process, it became clear that the decision framework cannot provide the exact organizational governance structure that will be implemented. More actors are involved and as a consequence that the implemented

organizational governance structure is based on a joint decision. This joint decision is not analyzed in this research, and for that reason the choice is made to design a framework that provides guidance through steps. Furthermore, because the decision-making process takes place in multi-actor setting it is also vital to note the impact of social systems on these decisions, and especially the social factor trust. Furthermore, the research field regarding decision-making processes in multi-actor setting contributes to the process design.

#### *Order of part 1 and part 2*

The order in part 1 and 2 is due to the fact that the primary focus in this research approach was to gain a better understanding regarding elements, that underpin organizational governance structures, and aspects that need to be considered to make a choice, based on literature and empirical evidence. The order of these parts impacts the amount of empirical data collected regarding the elements that underpin the organizational governance structure, the aspects that need to be considered to make a choice, and the characteristics of the decision-making process. Part 2 of phase I has received less empirical evidence compared to part 1. To gain more empirical insights regarding the impact of characteristics of the decision-making process on the framework, it is better to consider theoretical findings regarding decision-making processes during the case study analysis. In other words, execute the research field parallel instead of sequential.

#### *Research design approach*



**Figure 30 Design approach for decision-making processes**

Figure 30 illustrates the design approach applied in this research. The design approach became clear during the research. The main difference between this design approach and that of Herder and Stikkelman (2004) is that it clearly shows the importance of the characteristics of decision-making processes for defining the design requirements and the design space.

As Figure 30 also illustrates, a case study analysis is a useful method to evaluate the final framework. The final framework is not tested with a case study analysis but rather with a survey in this research. The underlying reason is because case studies are time consuming and to test which became impossible due to the limited time that was left over. But not testing the framework is not an option and for that reason a survey is chosen to test the framework.

## 9.2. Research result

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The framework together with the risk matrix is the final result of this research. Together they identify relevant aspects (factors, risks, control, and trust) and elements (financial structure, control mechanisms, and type of trust) that are vital to take into consideration. Moreover, they also illustrate the relation among these aspects and elements. The relation between the aspects and the elements are identified based on theoretical constructs and reasoning derived from TCE, RBV, RDT and theoretical discussions concerning risk, control, and trust.

All together, the framework and risk matrix guide decision-makers through three steps for the design of organizational governance structures. By structuring the decision-making process the complexity is simplified.

However, some remarks can be made regarding the framework and risk matrix.

- Compared to Williamson reasoning, who determines the organizational governance structure based on transactional properties, such as asset specificity, this research introduces risk in between. In other words, an extra step is introduced compared to Williamson reasoning, namely the identification of risks. With the introduction of risks, the link with the risk reduction purpose of organizational governance structures is directly made. Furthermore, with the introduction of risks it became possible to incorporate the subjectivity related to the decision caused by various risk perceptions, and the dynamic that is present in decision-making processes concerning organizational governance structures is also directly shown in the risk matrix.
- The framework rest on the assumption that decision-makers make intentionally rational decisions based on risk assessments, and how to mitigate these risks through a control package consisting of a financial structure, control mechanisms, and type of trust.
- The framework does not consider other aspects that drive the choice for organizational governance structure. The effects of corporate strategy, regulation, or the bandwagon effect are not taken into account. In this research, environmental uncertainties are not specified in specific categories. However, distinction can be made between environmental uncertainties that are caused by regulation, technological developments or demand developments. The latter two are considered but the first is not. Nonetheless, it should be acknowledged that the impact of regulation can easily be introduced in the decision framework.

## 9.3. Scientific contribution

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This research started with the aim to design a support tool and to analyze a knowledge gap. Based on academic calls, TCE and RBV are integrated to get insights in the management and control of organizational relationships. To gain more insights from a resource perspective, RBV is extended with RDT reasoning. In paragraph 3.4 the theoretical compatibility is discussed and with Williamsons' four layer model of institutions a better understanding is gained regarding the compatibility of TCE and RBV. It is argued that TCE is useful for analyzing the third layer and RBV for the fourth layer. This is retrievable in the decision framework. The outer layer is based on TCE and RBV and the closer you get to the inner layer the more dominant TCE's reasoning gets.

Besides TCE, RBV and RDT, trust and process elements are taken into consideration for design of the decision framework. Trust plays an important role in the middle and inner layer. Process elements provide better understanding how the decision framework can support the decision-making process. Together they provide insights in the decision-making process from a internal versus external, as well as, economic versus social perspective. In addition, insights regarding the dynamic in these decisions is provided.

Summarized, the theoretical contribution of this research is the verification of the usefulness of the integration of TCE and RBV, with the extension of RDT, for the analysis of organizational governance structures. These theories are further extended with trust for the design of the decision framework in order to take a social aspect and its effect on these decisions into account. And finally, process elements are also taken into account to gain a better understanding regarding the support capability of the framework. To conclude, the link between the research fields organizational management and decision-making processes in multi-actor setting are linked and based on that a new framework is designed, which is supported by a risk matrix. The decision framework and risk matrix, that integrate the mentioned research fields, contribute to theoretical discussions regarding decision-making processes concerning organizational governance structures.

#### 9.4. Further research recommendations

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To further strengthen the decision framework for organizational governance structures, the following recommendations are given for further research:

- Only bilateral organizational relationships are analyzed in this research. To include the complex characteristics of networks, it is recommended to extend the framework for network relationships. This can be performed by including theories regarding networks, such as social network theory.
- This research mentions the actors that are involved in the decision-making process, such as the departments: business development, product development, finance, legal, and purchase. This research did not execute an in-depth analysis of the impact of the different interest of the actors on the outcome of the process. In-depth actor analysis can provide a better understanding in the relationship between the actors, the behavior of the actors and their goals and interests. Furthermore, this research does not analyze formal and informal cooperation paths among these departments. How an organizational structure, on the department level, influences the choice for an organizational governance structure is neither analyzed.
- The framework is recommended as a tool stimulate knowledge sharing and learning, but the organizational structure within Vattenfall can play also a vital role in knowledge sharing and learning. This is also not analyzed in this research, and for that reason it is recommended for further research to concentrate also on the organizational structure within the organizations. Researchers should analyze how the organizational structure within Vattenfall can stimulate the knowledge sharing en learning.

- According to an employee of the product development department, the financial structure limits the choice in control mechanisms. Further research should obtain insights in the relation between financial structures and control mechanisms to further improve the decision framework. By analyzing this relation, the decision can be simplified more because the options within the combinations between financial structure and control mechanism is reduced.
- This framework advises a specific organizational governance structure based on the factor characteristics, and output and process risks. Statistical research on multiple cases can be performed to provide statistical support on the relation between, the advised organizational governance structure, and the success of the organizational relationship. To statistically test this relation the research must, first, determine whether the actual organizational governance structure is in line with the advised organizational governance structure.
- To strengthen the decision framework, it is also interesting to analyze if there are significant correlations between certain factor characteristics and the design of a particular organizational governance structure. In the case study analysis some remarks are made regarding some factor characteristics, especially regarding the maturity of the product. Due to the fact that only two cases are analyzed it became impossible to generalize the findings. A statistical research that analyzes the relations between the factor characteristics and organizational governance structures provides the ability to do so. Furthermore, it is also interesting to analyze the ranking among the factors. Which factor characteristics have strong and which factor characteristics have less influence on the choice for an organizational governance structure. Such a research will make the framework more specific.



## 10. Literature

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# Appendices

Appendix A: Theoretical operationalization

Appendix B: Interview protocol

Appendix C: Workshop

Appendix D: Verification survey

## Appendix A - Theoretical operationalization

The theoretical constructs such as the transactional properties and the resource attributes are quite abstract and should be operationalized beforehand in order to analyze whether these constructs can be retrieved within empirical findings. In this appendix the TCE and RBV are operationalized based on previous analysis.

Figure A1 illustrates how asset specificity is operationalized. The blue colored blocks are the blocks through which data is analyzed. Table A1 provides a detailed explanation of the theoretical operationalization of asset specificity.

**Table A1 Operationalization of asset specificity**

Asset specificity	Measurement criteria
Physical asset specificity is the level of product or service customized. (McIvor, 2009) Physical assets are tailored to a specific relation (Fernandez-Olmos, 2010) In this research the physical asset specificity is measured by the degree of product customization. It is assumed that the more the product is customized, the more likely the needed physical assets to produce that product are specific.	Degree of product customization
Human asset specificity refers to specialized investments in human capital that is specific for the organizational relationship. Human asset specificity can be measured through the costs dedicated to train the employees or recruit new employees in order to support the organizational relationship. This support can be realized by training the employees or recruit new employees to carry out the activities that are specific for the organizational relationship. Or it can be realized by training the employees or recruit new ones for the sole purpose to managing the organizational relationship (De Vita, 2010). In this research, human asset specificity is measured through the human capital investments to carry the activity for which the organization is responsible and through the tacit knowledge of the partner. It is assumed in this research that when the knowledge of the employees of the partner is tacit, it is more difficult for the focal company to train its employees for the purpose to manage and control the organizational relationship. In the end, higher costs are made regarding training. Or the company has to recruit someone who has this knowledge. Tacit knowledge is measured through the degree to which the employees have skills and experiences.	Costs made by the focal company in order to carry out the activities Tacit knowledge of the employees of the partner
Brand-name capital is an investment in reputation. Investments in reputation can be measured through advertisement costs but also through the costs made in order to safeguard the brand name. The latter costs are considered in this research because safeguarding the brand-name and having a great brand-name is important in downstream customer interfacing businesses. If a company has a strong brand name that is positively received by the customers, it is vulnerable to brand-name damages (De Vita, 2010). The assumption is	Brand-name reputation of focal company Brand-name reputation of partner Customer interface

made that the greater the brand-name reputation the more vulnerable the brand-name is for damages. In this research, the customer interface is important. When the partner has mainly the customer interface the partner can damage the brand-name of the focal company. The greater the customer interface is between the partner and the customer, the greater the damage can be. The brand-name capital is measured through the brand-name reputation of the focal company and the partner, and which of the organizations has the customer interface. It is assumed that when the focal company has a great brand-name reputation and the partner has mainly the customer's interface the focal company needs to invest in measures to prevent brand-name damages. It is also assumed that when the partner also has a great brand-name reputation, it is likely less motivated to damage the brand-name of the focal company because it also damages its own brand-name. Based on this, it is assumed that higher investments are needed in situation where the focal company has a great brand-name reputation and partner not, and where the partner has mainly the customer interface.	
Site asset specificity refers to the location of facilities so that inventory and transportation expenses are minimized (Lohtia, 1994). The customers that fall within the scope of this research are widely spread within the countries. In order to minimize inventory and transportation expenses, it is crucial that there are various facilities spread over the market. The geographical spread is measured through the amount of branches established in the market.	Local coverage (through amount of branches)
Temporal asset specificity is the specificity which arises when timely responses by on-site human assets is vital (Lohtia, 1994). To satisfy the customers, it is necessary that maintenance and reparation services are provided. There is no constant demand for maintenance, the demand is rather discrete than continuous. When the maintenance and reparation service should be provided exactly on time, it is difficult to determine when and as a consequence that it is difficult to arrange a supplier in place on short notice. For that reason the timing and coordination of maintenance is a specific assets. The more complex the maintenance management, the higher the temporal asset specificity.	Maintenance (reparation) management complexity
Dedicated asset specificity occurs when additional investments are made especially for the organizational relationship.	Specific investments for the organizational relationship

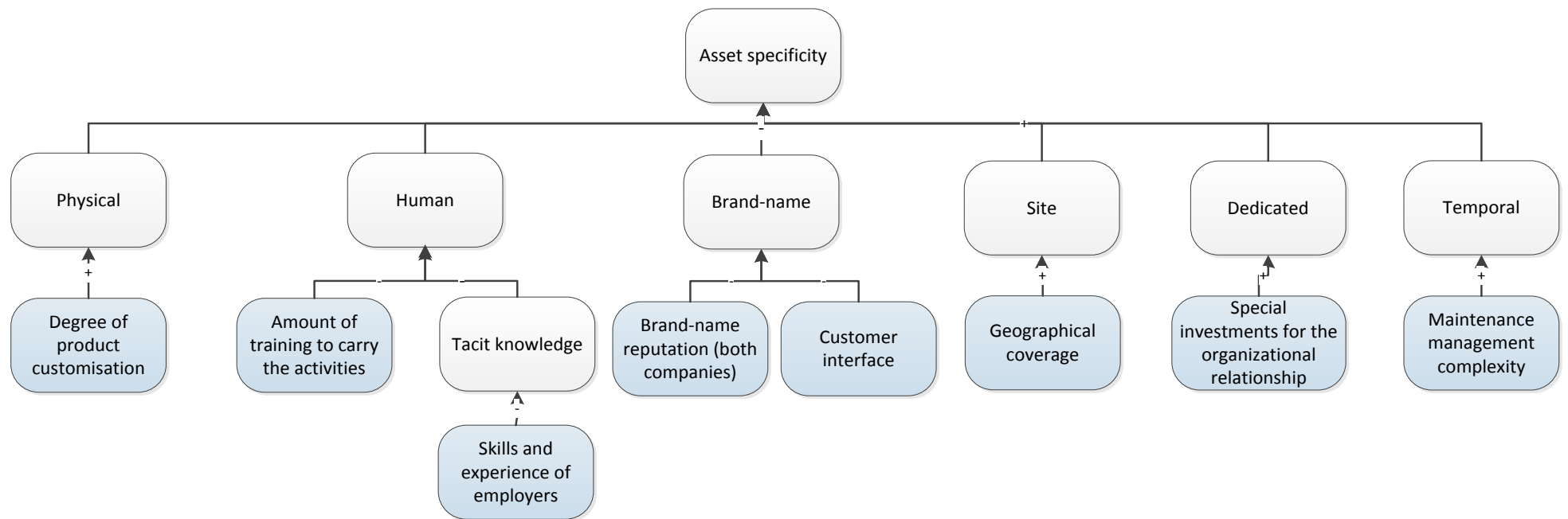


Figure A1 Operationalization of asset specificity

Table A2 Uncertainties and opportunism	Measurement criteria
<p>Environmental uncertainty are circumstances surrounding the exchange that cannot be specified in advance (Fernandez-Olmos, 2010). Van de Vrande (2009) defines two environmental uncertainties; environmental turbulence and technological newness. Environmental turbulence is significant in high-technology environments because they are characterized by unpredictable changes fostered by radical innovations. Environmental turbulence can also be measured through market maturity. A market is mature when innovations and developments are absent. Technological newness refers to the stage of product development, i.e. product maturity. Products that are in an early stage of development raise uncertainties which decreases over time as the product matures and becomes dominant. Another way of measuring the technological newness is through degree competition. As van Vrande (2009) argues are technological changes frequent when the degree of competition is low. Next to the technological newness and environmental turbulence it is assumed in this research that environmental uncertainties are also influenced by the market complexity. A market is complex when it is interconnected with various markets and vulnerable for developments within the interconnected markets. The higher the degree of interconnectedness the more vulnerable the market is for developments within the interconnected markets. This interconnectedness makes it complex to determine the developments within the market. Because it is difficult to determine the developments within the market the environmental uncertainties increase, and for that reason environmental uncertainty can be measured through market complexity. Figure A2, gives a quick overview of the operationalization of environmental uncertainties.</p>	<p>High-technology characteristics Market maturity Product maturity Degree of competition Market complexity</p>
<p>Behavioral uncertainty concerns the quality performance uncertainty which is highly influenced by the opportunistic behavior of the organizations. Nooteboom (2004) makes the distinction between opportunities for opportunism and intention towards opportunism which can be further divided, see figure A3. Nietsen (2011) discusses that opportunism can be measured the best through incentive alignment.</p>	<p>Size of the actors Product complexity Resource overlap Strategy overlap Resource dependency</p>

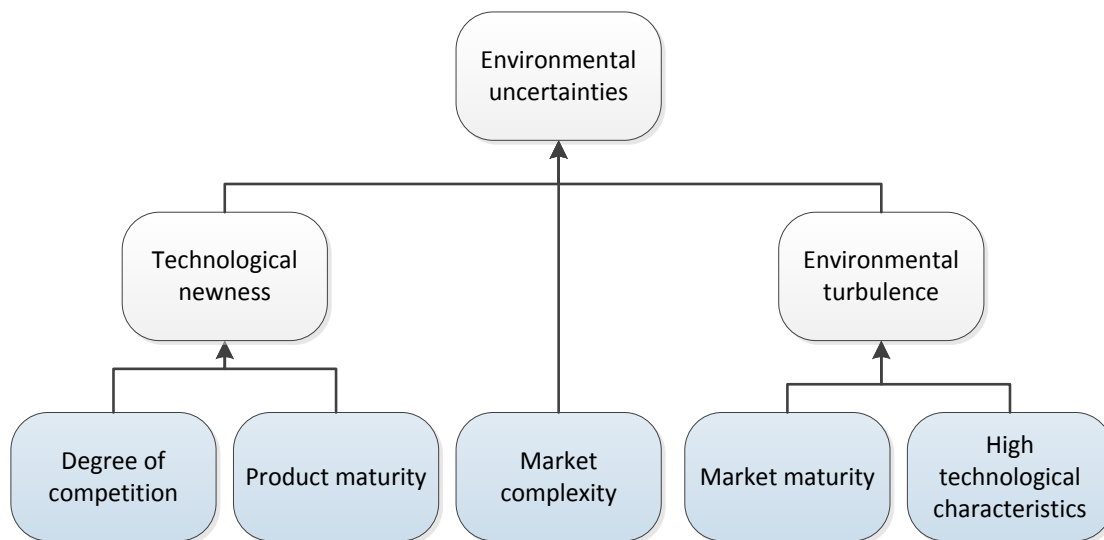


Figure A2 Operationalization of environmental uncertainties

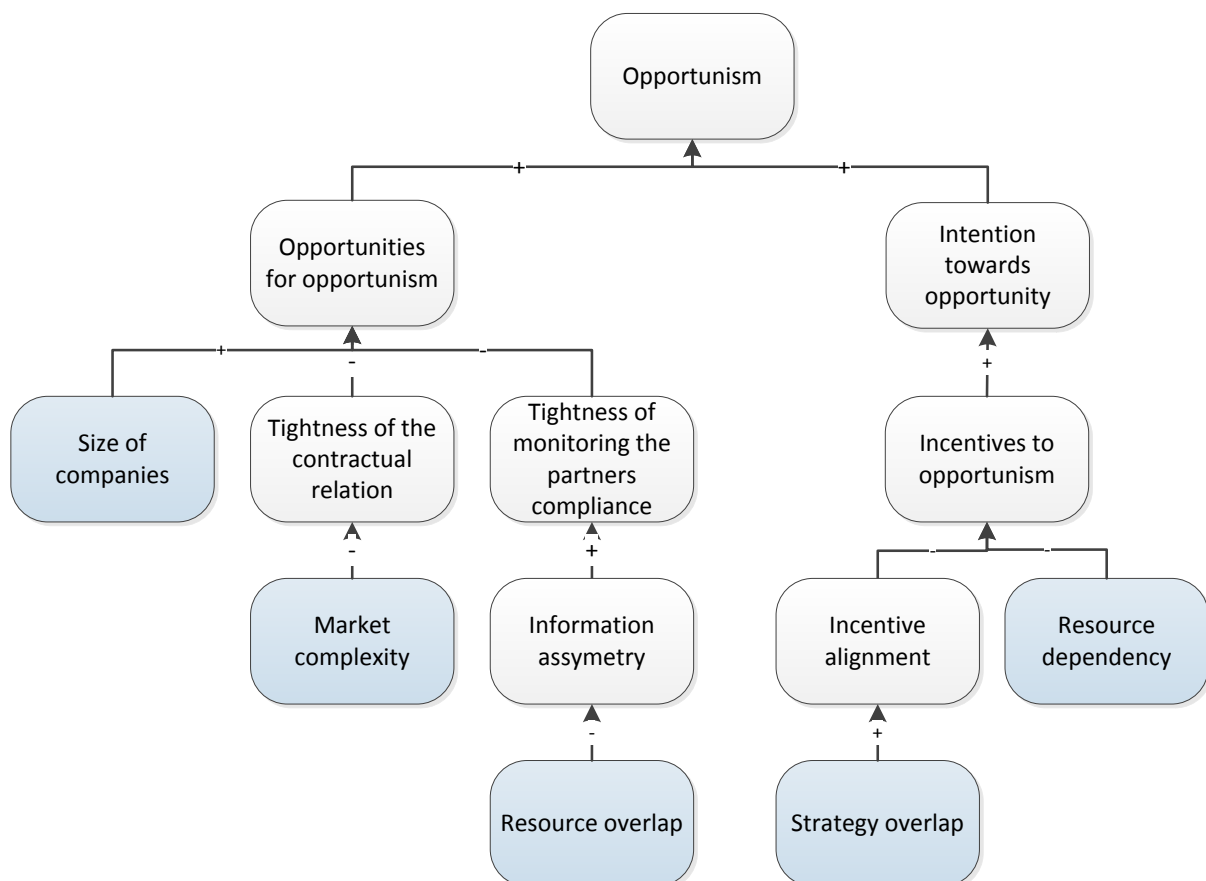


Figure A3 Operationalization of opportunism (Nietsen, 2011; B. Nooteboom, 2004)



**Table A3 Operationalization of strategic resource and resource dependency**

Strategic resources	Measurement criteria
<p><b>Strategic resources.</b></p> <p>As discussed in paragraph Barney (1990) defines resource strategic when they meet the VRIN attributes.</p>	<p>Valuable: Resources are valuable when they can be used to gain opportunities (Lockett, 2009)</p> <p>Rare</p> <p>Inimitable</p> <p>Non-substitutable</p>
<p><b>Resource dependency</b></p> <p>As discussed in paragraph 3.3 the resource dependency is defined by the resource richness of the organizations and the strategic resources the partner owns.</p>	<p>Resource richness</p> <p>Strategic resources</p>

## Appendix B - Interview protocol

### Interviewees

To gather empirical evidence various employees within Vattenfall are interviewed. Table B1 illustrates the amount of employees who are interviewed during the research. For anonymous reasons the names of the employees are not mentioned but their department. As table B1 illustrates are most the interviewees employees from Vattenfall. During this research, it was strived to make contact with Greenwave but Greenwave did not had the time to cooperate and contribute to the research.

Table B1 interviewees			
	Function	Company	Topic
1	Product development – Energy manager	Vattenfall	Case 1
2	Product development – Energy manager	Vattenfall	Case 1
3	Energy management solutions	Vattenfall	Case 1
4	Value added services	Vattenfall	Case 2
5	Sustainable City Program Development	Vattenfall	Case 2
6	Value added services	Subsidiary Feenstra	Case 2
7	Business unit Energy related	Subsidiary Feenstra	Case 2
8	Sales director Feenstra	Subsidiary Feenstra	Case 2
9	Value added services	Subsidiary Feenstra	Case 2
10	General services Benelux	Vattenfall	Contracts
11	Product development	Vattenfall	Solar panels
12	Energy management solutions	Vattenfall	Solar panels
13	Development program E-mobility	Vattenfall	E-vehicle

### Introduction to the interview

The interview takes place in the context of my graduation thesis at the Technical University of Delft. This research focuses on the way the inter-organizational relationship between Vattenfall and the partner, who is active in the energy-related market, is governed. The purpose of the interview is to identify the context wherein in the inter-organizational relationship is embedded, and how the relationship is governed with an inter-organizational governance structure and control mechanisms.

The interview will take an hour. If you do not mind I would like to tape our conversation.

## Interview questions

Table B2 Question list	
Category	Question
General	<p>Which product(s) and service(s) are provided to the customer?</p> <p>With which partner does Vattenfall cooperate to commercialize these product(s) and services(s)?</p> <p>Since when does Vattenfall collaborate with this partner</p>
Market	<p>How would you describe the market?</p> <p>Would you describe the market mature or rather immature and why? Do a lot of innovations take place?</p> <p>Is it a turbulent market? Are there many organizations active in this market?</p> <p>Would you describe the market complex? In other words is the market of the product and service related with other markets?</p> <p>How do these markets develop?</p> <p>How are the markets related to each other?</p> <p>Is the market of the product and service vulnerable for changes within the other markets?</p> <p>Is there a strong demand for the product?</p>
Product and service	<p>How would you describe the product?</p> <p>Customized vs. Standard</p> <p>Simple vs. complex (Product is complex when it is connected to other products)</p> <p>Under development vs. Completely developed</p> <p>Technical vs. Non-technical</p> <p>Does the product require maintenance and reparation service often?</p> <p>Is the management of the maintenance and reparation service complex? In other words does the maintenance and reparation service have to be executed within a certain time?</p>
Partner	<p>How is the partner selected? Through a vendor selection? Which criteria were used for the vendor selection?</p> <p>How many organizations participated the vendor selection?</p> <p>What are the characteristics of the partner?</p> <p>Is the partner a small or large company</p> <p>Is the partner a start-up or a well-known company?</p> <p>Does the partner have a wide geographical coverage?</p> <p>Does the partner has a good brand-reputation?</p>
Activities and resources	<p>Which activities are there along the complete value chain?</p> <p>Which activities fall within the responsibility of Vattenfall and the partner?</p> <p>Which resources are important in this exchange and who owns these resources?</p> <p>How do Vattenfall and the partner rely on each other's resources?</p> <p>Would you define one or more the resources strategic?</p>

Governance of the organizational relationship	<p>Can you elaborate how the inter-organizational relationship is governed?</p> <p>Through a simple buyer-supplier contract?</p> <p>Or did Vattenfall took the partner over?</p> <p>Or has Vattenfall shares? In other words has Vattenfall invested equity within the inter-organizational relationship</p> <p>Why has Vattenfall chosen to govern the organizational relationship in such a way?</p> <p>Did the partner wished to govern the collaboration differently?</p>
Control mechanisms	<p>Which risks accompany the relationship?</p> <ul style="list-style-type: none"> <li>- sales risk</li> <li>- spillover risk</li> <li>- hold-up risk</li> </ul> <p>How does Vattenfall strive to mitigate these risk to control mechanisms?</p> <p>How do these mechanisms work?</p>

## Appendix C - Workshop

This appendix describes the design of a workshop held on October 25<sup>th</sup> 2012 at Vattenfall in Amsterdam. In the following sub paragraphs, the purpose of the workshop, the participants, the work procedure and the supportive material are discussed. In the end the results of the workshop are discussed in this appendix.

### The purpose of the workshop

The workshop is organized, with the primary objective, to test whether the decision framework which is based on theoretical and empirical findings (see paragraph 6.4 and 0) has the ability to support decision-making processes concerning inter-organizational governance structures. The second objective is to create together with the workshop participants a more detailed decision framework that is more in line with the decision-making processes within Vattenfall.

### Workshop participants

To test whether the decision framework has the ability to support decision-making processes within Vattenfall employees which deal with inter-organizational governance structures on daily basis where invited. In total five employees participated from the following departments; Product house Netherlands, Product management, Product portfolio management, Legal sales and Market & Strategy analysis.

### Workshop procedure

In order to facilitate the workshop efficiently and gain as much information within the given time a workshop procedure is outlined. The workshop is divided into three main parts:

- Introduction and workshop procedure
- Discussion regarding factors, risks and control mechanisms
- Discussion regarding the support ability of the decision framework
- Table C1 gives an overview of the workshop procedure and the output

Table C1 Workshop set-up

Time	Workshop content	Output
11:00 – 11:10	Introduction topic and participants	N/A
11:10 – 11:15	Workshop procedure and instructions	N/A
11:15 - 11:40	First question: Factors	List of factors
	Second question: Risks	List of risks
	Third question: Control mechanisms	List of mechanisms
11:45 – 11:55	Decision framework	N/A

11:55 – 12:30	Discussion and conclusion	Support ability & recommendations
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### Part 1 Factors, risks and control mechanisms

In part 2 of the workshop a semi-open discussion was conducted with the focus on factors, risks and mechanisms. The underlying reason to have a semi-open discussion is to give the participants room to share their experiences and knowledge and steer the participants in the direction of the decision framework, at the same time.

The following three questions are asked to the participants:

- *Which factors are relevant based on experience in previous projects?*
- *Which risks are accompanied by these factors?*
- *Which (control) mechanisms exist to mitigate these risks?*

The participants receive 25 to 30 minutes to discuss the questions.

### Part 2 Decision framework

The third part of the workshop is focused on determining whether the decision framework has the ability to support the decision-making processes concerning the organizational governance structure. The decision framework is first explained with empirical examples and thereafter the participants get the ability to discuss the concepts and relations of the framework and the reasoning behind the framework. The central question in this part of the workshop is: *Does the decision framework have the ability to support/ complement decisions concerning partnership-models?*

For this part of the workshop participants also receive 25 to 30 minutes to discuss whether the decision framework can support their decision-making processes.

### Supportive material

Supportive material are needed to facilitate this workshop successfully. The whole workshop is supported by PowerPoint slides and to support the discussion regarding the factors, risks and control mechanisms a white board is used where the mentioned factors, risks and mechanisms are noted during the discussion.

## Appendix D - Verification survey

In order to determine whether the framework design is logic the framework is verified by a couple of experts within Vattenfall. The experts that were asked to fill in the survey are:

- purchaser from General Services Benelux department
- manager of Product development department
- manager of Public E-mobility solutions department.

### Explanation regarding the verification survey

My research objective is to design a tool (framework) that can support decisions concerning the management and control of partnerships. During the last 6 months I did research on this topic and designed a framework which I want to verify with you. With the following statements and with your agreement with these statements or not you can help me to verify the content and logic of the framework that I designed.

This verification procedure consists of two parts. First, general statements concerning the content of the framework are discussed. Second, the logic behind the framework is discussed.

- Start survey –

## Part I

1. To determine how organizational relationships should be managed it is important to identify the characteristics of the market (mature market, complex market, degree of competition, etc.).

Agree	1	2	3	4	5	6	7	Not agree
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2. To determine how organizational relationships should be managed it is important to identify the characteristics of the product (standard, customized, high-tech, under development or fully developed, etc.).

Agree	1	2	3	4	5	6	7	Not agree
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3. To determine how organizational relationships should be managed it is important to identify the characteristics of partner (size of the partner, start-up, well-known, etc.)

Agree	1	2	3	4	5	6	7	Not agree
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4. To determine how organizational relationships should be managed it is important to identify the resources that are exchanged within the partnership (commercial, technical and financial resources).

Agree	1	2	3	4	5	6	7	Not agree
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5. To determine how organizational relationships should be managed it is important to identify whether the resources that are exchanged are strategic. (Strategic resources are resources that valuable, rare, inimitable and non-substitutable).

Agree	1	2	3	4	5	6	7	Not agree
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6. Within organizational relationships it is also necessary to identify the risks that accompany the organizational relationships.

Agree	1	2	3	4	5	6	7	Not agree
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7. The risks that accompany the organizational relationships can be mitigated by measurements/agreements that control the output (profit, product quality).

Agree	1	2	3	4	5	6	7	Not agree
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8. The risks that accompany the organizational relationships can be mitigated by control mechanisms that control the processes (creating leads, installing product)

Agree	1	2	3	4	5	6	7	Not agree
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9. The risks that accompany the organizational relationships can be mitigated by financial structures such as an acquisition, joint venture, buyer-supplier contract

Agree	1	2	3	4	5	6	7	Not agree
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10. It is better to mitigate the risk through control mechanisms instead of financial structures

Agree	1	2	3	4	5	6	7	Not agree
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11. It is better to mitigate the risk through financial structures instead of control mechanisms

Agree	1	2	3	4	5	6	7	Not agree
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## Part II

Within my research a risk matrix is used to determine what type of financial structure and control mechanisms are needed to manage and control the risks that accompany a organizational relationship. This matrix is based on the following statements.

12. The risk perception is influenced by the knowledge regarding the product and processes that exists within a company.

Agree	1	2	3	4	5	6	7	Not agree
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13. If there is little knowledge regarding the product the risk that the output has undesired outcomes is greater.

Agree	1	2	3	4	5	6	7	Not agree
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14. If there is little knowledge regarding the processes the risk that the processes are executed in an unsatisfactory way is greater.

Agree	1	2	3	4	5	6	7	Not agree
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15. If it is difficult to determine control mechanisms that control the output performance it is better to have a hierarchical financial structure (Acquisition, joint venture)

Agree	1	2	3	4	5	6	7	Not agree
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16. If it is difficult to determine control mechanisms that control the performance of the processes it is better to have a hierarchical financial structure (Acquisition, joint venture)

Agree	1	2	3	4	5	6	7	Not agree
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