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ABSTRACT

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Abstract

The growing global economy and the rising demand for clean energy calls for huge investment into energy infrastructure. This investment is increasingly often carried out in the form of large-scale, complex ventures: megaprojects. Megaprojects face many challenges, due to which they are often going over time and over budget. One of the megaproject characteristics that cause these challenges is their complex stakeholder field. Megaprojects are multi-actor processes, with multiple parties from different backgrounds involved in planning and construction throughout the project.

This thesis explores how a megaproject progresses, what stakeholders are involved in each part of the project, and how the stakeholders are positioned at each step of the project. To answer these questions, previous megaproject literature is examined. In forming the theoretical framework, it is then combined with stakeholder theory, and the theory of stakeholder salience.

The study is carried out in the form of an intensive case study on the nuclear reactor construction project Olkiluoto 3. The project timeline is divided based on the findings of internal events of the project. These three different timeframes are then studied separately and compared.

The findings reveal that the stakeholder landscape is highly dynamic, with new stakeholders emerging and the salience of existing ones changing throughout the different phases of the project. The megaproject progress and challenges are aligned with previous literature. External stakeholders such as governing bodies emerge as the most frequently coded.

The dynamic stakeholder landscape and the interesting changes in salience show that there is need for megaproject management to not only identify the stakeholders but keep surveilling their salience that may change drastically, potentially resulting in challenges.

Key words	Megaprojects, nuclear, Olkiluoto, salience, stakeholders
Further information	

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STAKEHOLDERS THROUGHOUT AN INFRASTRUCTURE MEGAPROJECT

Case Olkiluoto 3

Master's Thesis
in International Business

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1 INTRODUCTION

1.1 Background

The accelerating pace of global economic development, rapid urbanization, and the urgent imperative to address climate change have dramatically increased the demand for new infrastructure worldwide. have made large investments into infrastructure increasingly vital. By the year 2040, overall global infrastructure investment is projected to reach 94 trillion USD. (Global Infrastructure Hub 2017.)

A significant share of these forecast infrastructure investments is in the energy sector. The focus of these investments is mostly on clean energy solutions such as renewables and nuclear power. Investments into clean energy are estimated to be twice the size of investments in fossil fuel technologies. This includes building new energy sources as well as replacing aging ones. (Global Infrastructure Hub 2017.)

Nuclear energy has faced challenges and opposition, both public and political. They stem from for example the Fukushima Daiichi nuclear plant disaster in 2011 (IEA 2025). Multiple countries have been retiring nuclear energy power plants. 6.3 GW worth of nuclear capacity was retired in 2023. (IEA 2024, 158.)

Nuclear acceptance has now begun to increase again, and nuclear energy is well positioned to make a comeback (IEA 2025). As of October 2024, 62 nuclear reactors with combined capacity of around 75 GW are under construction. These reactors alone are set to increase worldwide nuclear capacity by nearly 20 % once they are connected to the grid. Nuclear energy can offer baseload power, enhance the stability and flexibility of the grid, as well as optimize its capacity utilization. It is therefore a great answer to the increasing energy demand and the goals of emission reduction. (IEA 2024, 158.)

These new energy investments, including nuclear power plants, are increasingly often carried out through megaprojects. Megaprojects are temporary, complex ventures typically exceeding a billion dollars in value, involving a multitude of public and private stakeholders. Energy megaprojects usually involve high levels of innovation, and exert profound, long-term impacts on economies, societies, and the environment. (Brookes & Locatelli 2015, 58.)

Megaprojects are characterized by their massive scale, high levels of innovation, and the significant risks and uncertainties they have. The Olkiluoto 3 nuclear reactor project in Finland is an example of both the promise and the challenges of such undertakings. It is a project to construct a third nuclear reactor at Olkiluoto Island at Eurajoki, Finland. The Olkiluoto Nuclear Power Plant already included two previous reactors Olkiluoto 1 and 2, and the third one began construction in 2005. The original date for completion and commercial operation was 2009, but the project faced significant delays. The third reactor

was commissioned and began producing electricity commercially in 2023, being almost exactly 14 years late. The uniqueness of the project makes it an interesting topic of study. The project faced multiple challenges leading to massive delays, as well as huge cost overruns. The project is also a complex network of actors from diverse organizations with differing interests, roles and responsibilities. (Ruuska et al. 2011.)

The Olkiluoto 3 megaproject with its challenges, delays and cost overruns is a textbook example of the current state of megaprojects. One of the leading scholars on the topic of megaprojects, Bent Flyvbjerg (2014, 6) describes the "iron law of megaprojects" as: "Over budget, over time, over and over again." Megaprojects fail and disappoint due to multitude of reasons.

Despite the recurring challenges, megaprojects continue getting planned and built, in ever-increasing numbers (Söderlund et al. 2017, 5). The drivers behind this trend are multifaceted. On the one hand, the scale and urgency of infrastructure needs, particularly in the energy sector, need to be answered with ambitious, coordinated investments. On the other hand, megaprojects offer tangible benefits: they create and sustain jobs, stimulate local economies, foster technological and knowledge transfer, and can enhance national competitiveness and productivity. Moreover, the allure of the "technological sublime"-the excitement and prestige associated with building the biggest, fastest, or most advanced facilities-continues to motivate decision-makers and the public alike. (Flyvbjerg 2014.)

Yet, the very features that make megaprojects attractive also contribute to their complexity and risk of failure. A defining characteristic of megaprojects is their multi-actor nature: they bring together a diverse array of stakeholders: governments, private companies, financiers, regulators, local communities, and NGOs. Each has their own interests, roles, and sources of influence. The relationships among these stakeholders are dynamic, often shifting in response to project developments, external events, and changes in power or priorities. Misalignment or conflict among stakeholders can lead to delays, cost overruns, and even project failure. (Aaltonen & Kujala 2010.)

As such, a better understanding of stakeholders is required from the megaproject managers. Understanding these stakeholder dynamics is essential for improving megaproject outcomes. (Aaltonen & Kujala 2010.)

1.2 Problem setting and structure of the thesis

The objective of this thesis is to form a better understanding of how stakeholders and their positions change throughout a long-term megaproject. This is done by studying the case Olkiluoto 3. This thesis applies stakeholder theory to analyze how stakeholder positions and salience evolve throughout the Olkiluoto 3 project, aiming to generate insights that link to the existing megaproject literature and stakeholder theory. The aim is to study stakeholders at different points in the timeline of the project. By focusing on the Olkiluoto 3 case, this research not only sheds light on the stakeholder dynamics of one of Europe's most significant recent energy projects but also offers lessons that may be applicable to other large-scale infrastructure endeavors. By examining this case and its stakeholders, the study hopefully also provides useful information that can be applied to other similar projects. Future megaprojects and their management could then better prepare for the expected evolution of stakeholders throughout the project.

The main research question of the study is: **How do stakeholders and their positions change throughout an infrastructure megaproject?**

The sub-questions are:

- *How does a megaproject progress?*
- *Who/what are the initial stakeholders in an international infrastructure megaproject?*
- *How do the stakeholder relations differ from the original state?*

By answering these questions, the main objective of the thesis will be met. The sub-questions will help by tackling different parts of the main research problem.

The first sub-question will aid in forming a better understanding of megaprojects in general, so that a framework can be made in which to compare the case Olkiluoto 3 to. Understanding the key characteristics of a megaproject will also help in how the stakeholders are related to such a project, and what might usually be the parties involved and their issues. Answering this question shows how the case project has moved forward, and based on these findings, the division of the case project timeline can be made into reasonable parts that can be studied separately.

The second sub-question establishes the "starting point" for the megaproject. To answer the main question and figure out how the stakeholder relations evolve the initial stakeholders must first be identified. Not only are the initial stakeholders identified, but their initial relation and position on the project should also be made clear. Stakeholder theory will provide the framework with which the initial stakeholders are categorized.

The third and final sub-question will examine the stakeholder relations in later parts of the project. Of course, to first answer this question, the time windows in which the project

is examined must first be identified. To aid this, a timeline of the megaproject Olkiluoto 3 will be made when answering the first sub-question. The project is then inspected again from the divided timeline, to see what new stakeholders are found in addition to the initial ones. The initial stakeholders found earlier are also examined again, to see whether their positions in the project have changed. Some of their relations may have changed, some may have exited completely. In addition, the new stakeholders discovered are categorized with the stakeholder model, just like the initial stakeholders.

Next chapter is a literature review of the previous megaproject literature. The most important characteristics, challenges and trends of megaprojects are presented. After that, the stakeholder theory is presented. This includes the traditional stakeholder theory and how it applies in the project context, as well as the concept of stakeholder salience. Then, the methodology chapter is presented. The chapter shows how the research questions will be answered through collection and analysis of the data. This leads to the findings chapter that goes over what was found in the data set. After that, conclusions are drawn from these findings and linked to the theoretical framework.

2 MEGAPROJECTS

In order to answer the research question, we must examine the central term in it: megaprojects. First, we examine why megaprojects are built, and therefore why they are an interesting phenomenon to study. Then the existing literature and theories are presented to try and define what exactly are megaprojects, and what sort of characteristics be linked to them. The next sub-chapter will take a look at infrastructure investments in the energy sector, to understand what kind of issues and investment need these megaprojects are required to answer. Next chapter explores what kind of issues megaprojects have, and then some common challenges in megaprojects are presented, that lead to these issues. This creates a framework to which we can place the studied case, and to which we can compare it.

2.1 Why megaprojects?

Despite the massive costs and the disappointing outcomes of many megaprojects, they keep being built. In addition to the individual megaprojects growing ever larger, the number of them built is also growing (Söderlund et al. 2017, 5). But what drives this acceleration in the construction of megaprojects?

One of the main factors is the afore-mentioned need for large investments in infrastructure. McKinsey Global Institute (2016, 1) estimates that through 2030, the world needs to invest an average of 3.3 trillion USD a year in economic infrastructure just to keep up with the projected growth. Out of this 3.3 trillion USD, about 1 trillion USD would need to be invested into power infrastructure. McKinsey Global Institute (2017, 2) further estimated the required investments into the energy sector for 2017-2035. $3.7 trillion would need to be invested annually in that timeframe to meet projected growth. This number would have to be up to $1 trillion higher to meet the United Nations sustainable development goals. A total of 20.2 trillion USD would need to be spent on power infrastructure from 2017 to 2035.

For decision makers, making these infrastructure investments in the form of megaprojects is appealing. If the investment is done right and the project succeeds, there are multiple concrete benefits.

Megaprojects both create and sustain jobs. A new megaproject may sustain local jobs, for example in construction, and when completed they may create new jobs, for example in a finished factory. (Flyvbjerg 2014, 9.)

Another point is that megaprojects often contain a lot of domestic inputs relative to imports. As already mentioned, this may be in the form of workforce, but also by sourcing local materials (Nyarirangwe & Babatunde 2019). In the case of emerging economies, the

required knowledge and technologies might not be locally available, so the megaproject brings benefits in the form of knowledge and technology transfer as well (Mann & Banerjee 2011).

Megaprojects, for example production facilities, may lower production costs, improving competitiveness and productivity. New infrastructure built with megaprojects can also benefit consumers by offering higher quality services. New technologies and infrastructure build also have an impact on the environment, as for example old power plants are replaced by new power plant megaprojects. (Flyvbjerg 2014, 9.)

In addition to answering the investment needs, and the above-listed benefits, there are other reasons why megaprojects appear especially appealing to decision makers. Flyvbjerg (2014, 8) list "four sublimes" of megaproject management that attract decision makers: Technological, Political, Economic and Aesthetic sublimes. These sublimes play a major role in why the challenges outlined in the previous sub-chapter keep being overlooked by decision-makers.

The technological sublime, as first introduced by Frick (2008), refers to the excitement gotten from building technological advancements, for example the fastest train, tallest building, or biggest power plant. Another form would be the construction of something that is the first of its kind. In addition to appealing to the engineers and other designers and developers of such projects, the technological sublime also appeals to decision makers, politicians and the public. This is due to these colossally sized projects serving them repeated experiences of awe and wonder. These factors not only encourage building such projects but also influence how these projects are then designed and carried out. Technological sublime can influence public opinion. It can also drive up what the decision makers are willing to invest, as it is more attractive to build the largest power plant, instead of it falling only a bit short and being the second largest. (Frick 2008.)

Next is the political sublime, which Flyvbjerg (2014, 8) describes as the rapture that politicians get from building these megaprojects for themselves and their causes. Historically significant buildings and monuments are appealing to politicians and garner a lot of media attention. Positive public exposure from the opening ceremonies of significant projects is likely to aid these decision makers in getting re-elected or at least remembered.

Third is the "economic sublime". As the name suggests, this is the appeal of the economic benefits of building a megaproject. Flyvbjerg (2014, 9) describes it as "the delight businesspeople and trade unions get from making lots of money and jobs from megaprojects". As discussed before, the financial scale of megaprojects is massive, so there are usually plenty of economic gains to be had for multiple stakeholders. These include the gains of banks from the massive loans, investors who invest in the projects, contractors who get to work on them, and the list goes on.

The final sublime as introduced by Flyvbjerg (2017, 9) is the aesthetic sublime. This is the pleasure of looking at a unique, large, beautiful product of the megaproject. Flyvbjerg (2017, 9) mentions the Sydney Opera house as an example. The building is known worldwide. This sublime is of course felt by designers and architects but also affects the public, who get to enjoy these icons in the landscape.

2.2 Definitions and scale of megaprojects

Project Management Institute (2021, 4) defines a project as "A temporary endeavor undertaken to create a unique product, service or result." The temporality here indicates that there is a beginning and an end to the project, or different phases of the project work. A project can be a standalone endeavor, or a part of a series of projects, for example in the form of a program or portfolio. (Project Management Institute 2021.)

There are multiple ways to define a megaproject. The term megaproject is used in this thesis, but it is worth noting that other terms have also be used to describe the same phenomena. These include for example complex project, giant project and large project (Ruuska et al. 2011, 648).

Although it may seem like a megaproject is a normal, smaller project but magnified, it is not as simple as that. Megaprojects have their own level of complexity, impact, aspiration, lead times, and crucially for this thesis, stakeholder involvement. (Flyvbjerg 2017, 3.)

Flyvbjerg (2017, 2) defines megaprojects as "large-scale, complex ventures that typically cost a billion dollars or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people."

The financial scale of megaprojects is massive. Megaprojects are not only large in scale, but they are also constantly growing larger. Within the past century, the value of megaprojects has grown by 1.5 to 2.5 percent annually. This means that the size of the projects would double two to three times a century. (Flyvbjerg 2017, 4.)

The name "megaproject" can also be considered rather outdated. The word mega in scientific terms means specifically "one million". Before, this would've been a fitting term, as the cost of the largest projects was measured in millions of dollars up until about the Second World War. In the present day, however, costs have increased, and the largest projects cost billions, or even trillions of dollars (Flyvbjerg 2014, 7). Flyvbjerg (2017) illustrates this massive scale of costs by comparing megaprojects to one of the largest financial figures in public economics, the US debt to China. Being just over a trillion dollars, it is considered large enough to destabilize the world economy. And even then, it only takes two of the largest megaprojects, the Joint Strike Fighter aircraft program, and

China's high-speed rail project to cover more than half of that figure. The sums that megaprojects deal with are on their own level, enough to surpass many other investment figures. In dollar terms, the largest ones can be as big as the GDP of many nations (Flyvbjerg 2017, 3).

2.3 Infrastructure projects in the energy sector

Infrastructure projects and their increasing size and intensity account for a huge chunk of global economic growth. They are essential to meet the requirements of a progressing society. Trends by Global Infrastructure Hub (2017) forecast that overall infrastructure investments will reach 94 trillion USD by the year 2040. A big part of these infrastructure investments is in the energy sector.

This urgent need for large investments in energy infrastructure is explained by multiple factors. The main issues they address are growing energy, especially electricity, demands, replacing aging infrastructure, energy security and the transition to more sustainable and clean energy. Large investments have therefore been made, and will have to be made, into new power plants. As the numbers show, more and more of these will be clean energy power plants, among them nuclear power plants. (Brookes & Locatelli 2015.)

The energy sector is now entering a new era of electricity demand. Not only are the conventional usage areas such as lighting or air conditioning on the rise, but there is a whole array of new challenges that ramp up the global demand for electricity. One challenge is the rising popularity of electric vehicles. Another challenge is data centers, the number and size of which has increased due to accelerating digitalization, and especially the boom in AI. For now, the global impact of these data centers on the increase of energy consumption is low compared to, for example electric vehicles and air conditioners. As of 2023, the electricity consumption of these data centers accounted for only around 1% of electricity demand. However, the local impacts can be much more severe, as for example in Ireland they account for 20% of the national electricity consumption. (IEA 2025, 8–37.)

To meet the ever-increasing global energy demands, the energy sector is in need of substantial investments. In the coming years, new infrastructure is required to keep up with the energy demand (Brookes & Locatelli 2015, 57). Global Infrastructure Hub (2017) forecasts that continuing with current trends, 26 trillion USD will be invested in energy sector infrastructure by the year 2040. International Energy Agency (2024, 238) predicts that the overall annual energy sector investment in 2024 will surpass 3 trillion USD for the first time. In 2023, this number was already 2.9 trillion USD. Majority of these investments are into clean energy, including nuclear energy, with clean energy investments overweighing fossil energy investments by a ratio of 2 to 1. The trend in

transitioning from fossil fuels to clean energy is evident also in the investments made. Investments in fossil fuels have declined by over 30 % since 2015, while in the same timeframe investments on clean energy increased by almost 70 % (IEA 2024, 238). The same trend is predicted to continue. In 2035, clean energy is predicted to account for more than 75 % of total energy investments. In a scenario where Net Zero Emissions goal is met, these investments would have to account for more than 95 % of the investments, for a total of 5.2 trillion USD in 2035. (IEA 2024, 239.)

In the context of nuclear energy, perhaps the most interesting figure is how the investments into clean energy infrastructure and technology have rocketed. In the last few years, since 2020, this number has grown by 60 % (IEA 2024, 61). Nuclear energy, and the construction of new power plants, seems like a good answer for the energy sector challenges. Its strengths are in its reliable and stable large energy creation, low emissions, and smaller dependance on imports (Saunders & Townsend 2019, 144). In the three years forward from 2020, annual investment in nuclear energy has increased by almost 50% (IEA 2025, 8).

A major weakness, however, is the large fixed costs. New nuclear power plants are often carried out in megaprojects that require massive investment and involve multiple parties both inside and outside the project (Saunders & Townsend 2019, 145).

2.4 Challenges of megaprojects

Partly due to the increase in size and complexity, megaprojects are often challenging to manage, and don't move forward as planned. Megaprojects are often met with cost overruns, longer completion schedules and operability problems. The stretching budgets and timelines mean that many of the megaprojects end up being disappointing for the shareholders, destroying their wealth. Shareholders aren't the only stakeholders affected by a disastrous megaproject, as the local population and environment may also suffer the consequences. The delays in the project also often times mean that the expected benefits from the megaproject do not become reality. (Merrow 2011, 12.)

Cost overruns in megaprojects are a norm, as studies show that nine out of ten megaprojects have cost overruns. The overruns can be quite large as well, as overruns over 50 % are not uncommon. As an example, the Sydney Opera House went 1400 % over budget. Another example is the Channel Tunnel between the UK and France, that went 80 % over budget. This is a great example of another megaproject characteristic: the project may well be a technological success, but a financial disaster at the same time. Due to the huge cost overruns and the resulting effect of taking loans on top of loans, the rate of return of the English Channel Tunnel is negative, at -14,5 %. This seemingly successful

and useful piece of infrastructure therefore is a net loss on the British economy, of about 17.8 billion USD. (Flyvbjerg 2014, 10.)

In addition to going over budget, megaprojects also tend to go over time. These stretching timelines can delay or diminish the benefits gained from the project. They also lead to cost overruns, as delays and extensions correlate directly with the costs. This doesn't mean that one should rush through a project, especially planning. Adequate time and resources should be spent on the planning phase, to see if the megaproject is even viable to begin with. The opposite is unfortunately more common in practice. The planning phase is rushed, and even projects that are sure to fail are greenlit. Problems then arise during the project and delays push the benefits far into the future. In the debt-financed projects this creates extra problems, as now the cost overruns get out of hand when the debt grows, and there is no revenue to pay for it as the project is not finished. (Flyvbjerg 2014, 10.)

What characteristics and decisions in megaprojects then lead to these stretching budgets and timelines? Challenges arise in megaprojects because certain aspects are overlooked. Often these important issues are not paid attention to. Flyvbjerg (2014, 9) lists ten characteristics typical for megaprojects that lead to these issues. This list is used as a basis to give a good overview of the most common megaproject challenges.

Firstly, megaprojects have a long planning horizon and complex interfaces, which inherently make them risky. In addition, the management is often inexperienced in megaproject management. In the long timeframe that these projects have, the management also often changes during the project. This weakens the leadership even more. (Flyvbjerg 2014, 9.)

Furthermore, management and planning of the project is usually a process that involves multiple stakeholders all with their own interests. These stakeholders are from different backgrounds, both public and private. It is difficult for the project managers to manage and govern these stakeholders from different cultures. (Aaltonen & Kujala, 2010.)

The fourth issue outlined by Flyvbjerg (2014, 9) is "uniqueness bias". It means that the management of megaprojects often see their projects as unique and singular, preventing them from learning from other megaprojects. Study by Budzier and Flyvbjerg (2013) even shows that the managers who see their project as unique perform significantly worse than their peers. This sort of thinking stems from the fact that in megaprojects technology and design are non-standard, making it easy to think that the project cannot be compared to others.

In megaprojects, there is often overcommitment to certain concept or idea of the project, that results in "lock-in". This leads to management not seeking alternatives or analyzing the chosen ideas properly. Once the idea is locked in, it is then tougher to change later on, only strengthening the commitment. (Flyvbjerg 2014, 9.)

The financial scale of megaprojects combined with their complex set of stakeholders leads to many challenges as well. Principal-agent problems and optimism bias are common due to the large sums of money involved in the projects (Flyvbjerg 2014, 9). Principal-agent problem refers to a situation often present in megaprojects, where an entity or person (agent), acts on behalf of another entity (principal). Problems arise when the interests and goals of the principal and agent conflict, or when there is insufficient information flowing between the two (Eisenhardt 1989, 58). Optimism bias means that the project managers make decisions based on delusional optimism. They dismiss rational probabilities and comparisons and also fail to recognize potential hazards and risks in the project. This leads to the underestimation of costs and time, and the management pursuing project choices that have no real chance of succeeding. (Flyvbjerg et al. 2009, 172.)

Flyvbjerg (2014, 9) notes that in addition to probable changes in management throughout a project's lifecycle, the very scope of the project might change as well. Decision makers may become more ambitious, making the already challenging project even more so.

High risk in the delivery of megaprojects also stems from their overexposure to so-called "Black Swans". The term stems from the old belief that there are no black colored swans, since there were no sightings of such and therefore no empirical evidence of their existence. Of course, there are black swans, which were discovered once Australia was discovered. This means that one finding can suddenly change that which was based on millennia of evidence. (Taleb 2010, 15.) Taleb (2010, 16) describes Black Swans as events with three attributes: rarity, extreme impact and retrospective predictability. The events are outliers, since the past evidence doesn't suggest that an event like this could happen. After an event like this, explanations for its occurrence are made, meaning that the event is explainable and predictable, but only after it has already happened. Managers typically treat megaprojects as straightforward and deterministic, where the laws of cause-and-effect rule and they have control over the outcomes, meaning they don't account for these "Black Swans" (Flyvbjerg 2014, 9).

Moreover, as statistical evidence shows, even smaller unexpected events and extra complexity in megaprojects are not prepared for. This means that the original budget of both time and money is insufficient to answer these sudden changes. This leads to the final challenging characteristic of megaprojects outlined by Flyvbjerg (2014, 9), misinformation throughout the megaproject. Both in the development of the project and the decision-making process, there is misinformation about the costs, schedules, benefits and risks of the project. This is the norm, rather than an exception. (Flyvbjerg 2014, 9.)

2.5 Synthesis of megaprojects

Megaprojects are being built in ever-increasing numbers, despite their multiple challenges. They aim to answer the increasing demands of growing economies. Especially in the energy sector, megaprojects play an important role. Electricity demand is rising globally. In addition, the climate goals demand more clean energy, and a shift from fossil fuels to other energy sources. Nuclear energy plays a big role in moving to cleaner energy. This is why nuclear megaprojects are so important and are getting built more and more.

Megaprojects are chosen also for simpler reasons that appeal to different decision makers and planners, as well as the general public. Megaprojects are favored by decision makers due to their political impact. Locals and architects favor them due to their uniqueness and aesthetics. The technological uniqueness excites planners to strive for first of their kind technologies and designs, or just to build superlatives, like the “biggest monument”. The economic scale appeals to financiers, as well as contractors and suppliers.

Megaprojects are large-scale, complex projects. They are not to be thought of as a normal project that is just larger. With their increased size comes characteristics that require their own considerations, and different kind of management. Most importantly for the justification of this thesis, megaprojects are multi-actor processes. They include multiple stakeholders from different backgrounds, that can change throughout the project.

Megaprojects are inherently risky due to their large costs and long planning horizons. Not only are the costs large, but they are often misjudged at the planning stage, with many megaprojects going over budget. The same applies for the time aspect, as it is common for megaprojects to be delayed as well. Management could just be overconfident or ignorant about the costs and timeframe, or it could be other common megaproject challenges that cause these issues to emerge. These challenges include unexpected events, challenges from uniqueness, shifting scope and misinformation.

Based on the frequency and scale of megaprojects and their failures, and the importance of their success, one would think that project management would be alert to their potential challenges and do everything to enable their success. As the previous literature shows, this is often not the case and both more capable management and more studies into megaprojects are required.

3 STAKEHOLDER THEORY

This chapter will introduce the main theoretical framework, the stakeholder theory. Stakeholder theory will be used to define what classifies as a stakeholder in this study. First, the most common groups of stakeholders will be presented. These are derived from the previous literature of stakeholder theory, and the ones relevant to this study are included. In addition to these concrete groups, a more theoretical categorizing of the stakeholders is presented. This is based on the model of stakeholder salience by Mitchell, Agle and Wood (1997). This grouping will give a better idea of where the stakeholders stand compared to the project, for example how important the project is for them, and how important the stakeholders are for the project. At the end of this chapter, the concept of stakeholders is then joined with the concept of projects and megaprojects. Previous literature on stakeholders and their actions in projects is examined to create a synthesis of the theoretical framework of this thesis.

3.1 Defining stakeholders

With so many different approaches to stakeholder theory, and equally as many different definitions of stakeholder, stakeholder theory as a whole can be quite a vague and broad concept and is often criticized. Part of this stems from the recurring practice of using to the term "stakeholders" in research, without referring to any particular stakeholder theory. Researchers may also incorporate parts of their concept of stakeholders from multiple different theories without mentioning it clearly. It is also common for a study to use the term "stakeholder", to only refer to a very specific set of stakeholders but failing to properly present and justify that set. These reasons make it important to present the different definitions of stakeholders and aspects of stakeholder theory that will be used in this thesis. (Friedman & Miles 2006, 4.)

As mentioned, there are many ways to define stakeholders. There are multiple answers to the question "what is a stakeholder?". One of the commonly used earliest answer is by Freeman (1984, 46), who defines stakeholders as "*any group or individual who can affect or is affected by the achievement of the organization's objectives"*. This broad definition includes a wide range of stakeholders outside the organization, but inside as well, as it suggests that organizations themselves are groupings of stakeholders. In this model, the management of stakeholders is the responsibility of a particular group of stakeholders, the top-level managers. Evan and Freeman (1993) expand upon this definition with two principles: *Principle of corporate legitimacy*, and *the stakeholder fiduciary principle*. This means that the corporation must be managed for the benefit of its stakeholders, and the management is trusted to act as an agent in the interests of the stakeholders.

There are multiple more definitions on stakeholders, and the definitions have evolved over time. Freeman (2004, 58) himself later proposes a narrower definition where the stakeholders are "*those groups who are vital to the survival and success of the corporation"*. The aforementioned two principles are also adjusted and re-worded as *the stakeholder-enabling principle* and *the principle of director responsibility*. More interestingly for this thesis, Freeman also proposes a third principle. The third principle reflected an idea, that was rather new at the time, of thinking of stakeholder theory from the perspective of the stakeholder. It is *the principle of stakeholder recourse*, which means that "stakeholders may bring an action against the directors for failure to perform the required duty of care". (Freeman 2004, 64.)

These two descriptions by Freeman belong to the *normative* aspect of stakeholder theory. These types of theories are concerned with how managers, and sometimes other stakeholders, should act. Management should see the purpose of the organization and act on it based on some ethical principle. Other approaches to stakeholder theories exist as well. These are more concerned with how the managers and other stakeholders actually act, and how they themselves see their actions and roles. These are called *descriptive* stakeholder theories. The third approach is called *instrumental* stakeholder theory. It is focused on how the managers should act in order to maximize, for example, profits or stockholder value. Out of these three aspects, that are also shown below in Figure 1, the descriptive ones are the most crucial for this thesis, as the focus is indeed on describing the stakeholders and their actions. (Donaldson & Preston 1995.)

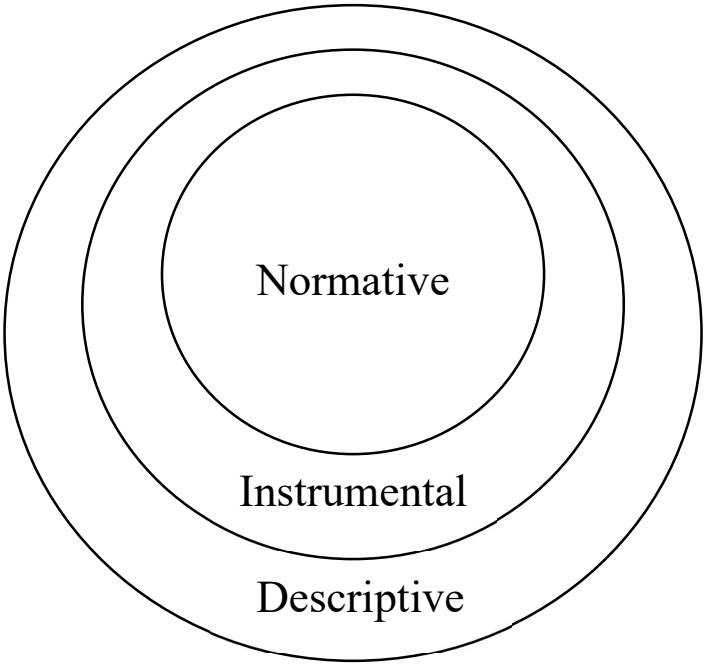

Figure 1 The three aspects of stakeholder theory (Donaldson & Preston 1995)

But as seen in Figure 1, Donaldson and Preston (1995, 74) show, all three aspects are linked and present in stakeholder theory. The aspects are nested within each other. On the outermost layer is the descriptive aspect, presenting the observed stakeholders and their relations. The next layer of instrumental approach then identifies connections between stakeholders and their actions to organizations' results and goals. Donaldson and Preston (1995, 74) describe this predictive value of instrumental stakeholder theory as "*If* certain practices are carried out, *then* certain results will be obtained." At the core of stakeholder theory, are the normative aspects. The descriptive and instrumental aspects assume true the core normative idea of the managers acting with all stakeholder interests in mind. This morality gives stakeholder theory its normative base. (Donaldson & Preston 1995, 74.)

This thesis uses a normative theory in defining and identifying the stakeholders, by following the earlier mentioned definition by Freeman (1984, 46). More specifically, the wider approach is used. The key is the phrase "can affect or is affected by" rather than the narrow "on which the organizations is dependent for its survival". The phrase in the wider definition allows for the idea for stakeholders that are "outside" the organization. This includes parties that the organization might not even consider as stakeholders but are nevertheless crucial for this study. This definition is later used in analyzing the data to find the initial and largest list of potential stakeholders. In addition to the phrase allowing for more stakeholders, the choice of verb in the definition also broadens the definition. The word "affect" is rather passive and all encompassing. This is suitable for a study such as this one, where we are not limiting the stakeholder discovery based on how exactly they are affected by, or they affect the project. Other definitions use more descriptive verbs such as "benefit", "harm" or "support". Rather than limit a study where a comprehensive list of different types of stakeholders is wanted by choosing only one of these verbs, the wide approach is used, which includes the aforementioned types of verbs, but is not limited to them. (Friedman & Miles 2006.)

Once we have a good definition for a stakeholder, the next step is to classify the stakeholders. Friedman and Miles (2006) present in their book a list of the most common groups of stakeholders:

- Shareholders
- Customers
- Suppliers and distributors
- Employees
- Local communities

These groups are not the only ones that can be considered stakeholders, and the list can be expanded or shortened depending on what kind of a definition you want to apply to stakeholders. On one end of this spectrum is the narrowest definitions. These may include only the five groups mentioned above, or even fewer. On the other end of the spectrum, the widest definitions include more than just these five groups or expand the

existing five. In the widest definition, we can consider every entity a stakeholder if the firm's actions affect them directly or indirectly. Even larger groups are gotten by including those groups that an alternative firm decision, that was not even enacted, could have influenced. For this study, a rather wide approach is suitable. Especially the starting point of the data analysis can be quite wide to gather a comprehensive view of the stakeholder network.

The five most common stakeholders mentioned earlier should be included in the framework of this study, as they are indeed so common, they are very likely to be found in this case project as well. The five groups are also part of the narrow definitions of stakeholders. In a wider definition, almost everyone and everything can be considered stakeholders, as they can be affected at least in some way by what the organization does. Out of these almost unlimited entities, Friedman and Miles (2006) present some relevant and common extensions to the previous list of stakeholders:

- Stakeholder representatives such as trade unions or trade associations of suppliers or of distributors
- NGOs or 'activists' that have been considered individually or as stakeholder representatives
- Competitors
- Government(s), regulators, and other policymakers
- Financiers other than stockholders (creditors, bondholders, debt providers)
- The media
- The public in general
- Non-human aspects of the Earth, the natural environment
- Business partners
- Academics
- Future generations
- Past generations
- Archetypes

This list includes stakeholders, that would be excluded by the narrow definition of stakeholders. For example, some NGOs may not be crucial to the organization's success, but the organization and their choices may affect the NGO, and vice-versa. This list does not include managers or the management itself in any other form. However, as discussed earlier, in the wider definitions of stakeholders, the organization itself can be seen as a group of stakeholders. The managers therefore are one of the stakeholders in this wide approach. They of course have a very different kind of power and stake in the organization. The wider approach dividing the stakeholders into more and more groups is advantageous in that it likely finds more homogenous groupings of things and people. However, this finer categorization has a limitation in that the overlap between the interests of these fine groups is more likely. (Friedman & Miles 2006, 14.)

The original five groups of stakeholders, plus the longer list, found with the wide approach, later form the basis for the stakeholder identification process of this thesis.

3.2 Stakeholder salience

In addition to the normative aspect of stakeholder theory in identifying the stakeholders, the descriptive theory of stakeholder salience is used in identifying the different stakeholders' positions in relation to the organization. The stakeholder salience model, proposed in the article by Mitchell, Agle and Wood (1997), can be used to group stakeholders into classes depending on how the stakeholder is able to command salience and influence on the organization. Salience refers to "the degree to which managers give priority to competing stakeholder claims" (Mitchell et al. 1997, 854). According to the stakeholder salience theory, this depends on how the stakeholder is perceived to possess the three attributes of *power, legitimacy* and *urgency.*

This classification will enable the study to evaluate the discovered stakeholders and their interests in relation to the case project. Studying these three dimensions of power, legitimacy and urgency, will give an idea to how important the stakeholder and its interests are to the case, and vice versa. For example, a stakeholder might have an urgent interest in the project, and demand something from it. However, they may lack the power to get what they demand, so therefore the stakeholder's interest may not be critical for the project's success or have an effect on it. (Mitchell et al. 1997.)

Based on what combination of these attributes the stakeholder is perceived to possess, seven classes of stakeholders can be identified, plus the group of non-stakeholders. A good way to present the salience model is via a Venn diagram, as shown in Figure 2 derived from Mitchell, Agle and Wood's article (1997, 874). This diagram shows into which classes a stakeholder belongs depending on whether they possess power, legitimacy, and urgency.

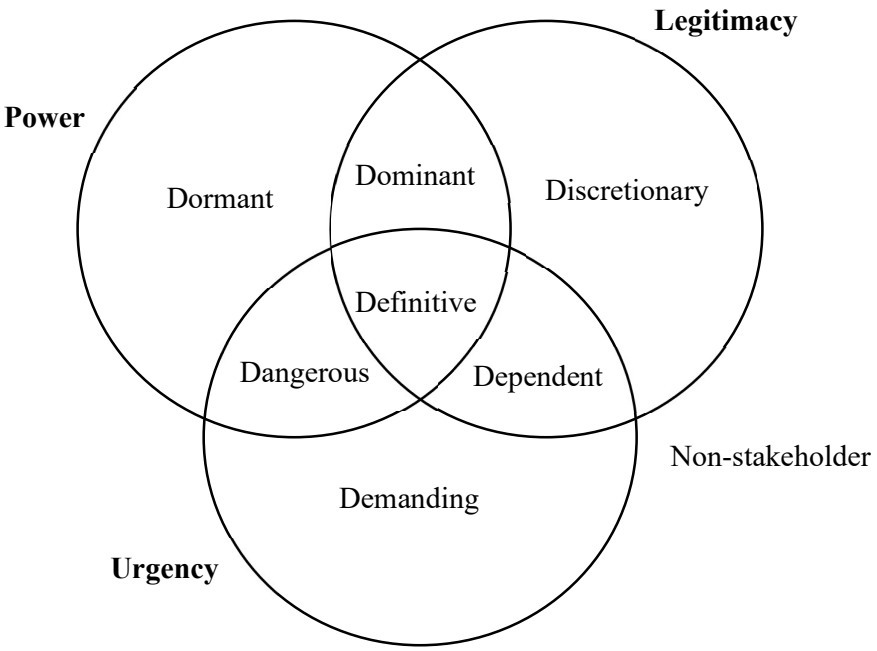

Figure 2 Qualitative classes of stakeholders (Mitchell et al. 1997, 874)

The different combinations of the three form the eight classes, that are divided into three groups depending on their salience. The group with low salience is also called latent stakeholders. These include dormant, discretionary, and demanding stakeholders. The latent stakeholders only hold one of the three attributes. Moderately salient classes, also called expectant stakeholders, have two of the attributes. The group consists of dominant, dangerous, and dependent stakeholders. The last group, highly salient stakeholders, include definitive stakeholders, which have all the attributes. Parties that possess none of the three attributes, and are outside of the diagram, are non-stakeholders. The following paragraphs further explain these groups, and what kind of stakeholders could be part of each class. (Mitchell et al. 1997, 872–879.)

Latent stakeholders, those who the organization perceive as possessing only one of the three attributes, are low in salience, and therefore the management might ignore them entirely, or not even spend any time identifying them. The same goes for the latent stakeholders themselves, as they might also ignore the organization. (Mitchell et al. 1997, 874.)

Dormant stakeholders are those who possess power but lack other attributes. Power remains unused, since there is no legitimacy or urgency. A dormant stakeholder could be, for example, a party with ample funds to spend, but no interest in the organization or possible way to do so yet. As mentioned, organizations might ignore and fail to recognize these types of latent stakeholders, but it is important that managers at least try to remain aware of this group. This is because the dormant stakeholder may be able to acquire one of the two remaining attributes and then become salient. (Mitchell et al. 1997, 874.)

The second class of latent stakeholders, discretionary stakeholders, are different, as there is no pressure for the management to engage actively with them. They lack power and urgent demands so any active relationship with them is purely the manager's choice. Discretionary stakeholders are therefore recipients of "corporate philanthropy". It must be specified that not all such recipients belong in the discretionary class, only those who have no power or urgent claims. (Mitchell et al. 1997, 875.)

The third latent stakeholder class is demanding stakeholders. Mitchell, Agle and Wood (1997, 875) describe them as "the mosquitoes buzzing in the ears of managers". They are the stakeholders that demand something, and can be irritating to management, but not dangerous or necessarily warrant any attention from the organization. These stakeholders are unable to acquire the power or legitimacy to get what they want. (Mitchell et al. 1997, 875.)

The group that possesses two of the three attributes, the expectant stakeholders, has a very different relationship with the organization and the managers than the previously discussed group that has a latent relationship. Mitchell, Agle and Wood (1997, 876) notice, that in situations where a stakeholder possesses two of the attributes, the relationship is more active, and the stakeholders are seen as "expecting something". With the stakeholder more active, the responsiveness from the managers is likely also higher, leading this class to be moderately salient.

The first expectant class is dominant stakeholders. They are both powerful and legitimate and therefore have the position to influence the organization but may not ever choose to do so. These stakeholders are taken into consideration, and many organizations have some formal structure that accomplishes this, such as a human resource department for employees or an investor relations office for shareholders. In some studies, this is the class of stakeholders that are considered the only ones and receive the most attention from managers. Stockholders are an example of dominant stakeholders. (Mitchell et al. 1997, 877.)

The class with urgent legitimate claims but no power is called dependent stakeholders. Mitchell, Agle and Wood (1997, 877) explain this naming is due to these stakeholders depending on other stakeholders' power to fulfill their claims. An example could be locals or the natural environment in case of an organization harming the environment. They would need the help of a dominant stakeholder, such as a government official, to enforce their claims. These sorts of relationships give a good idea of how these expectant stakeholders are more dynamic, as in this example a dependent stakeholder moves to the most salient class, by being backed by a dominant stakeholder.

The third class in the expectant stakeholder group are the dangerous stakeholders. They possess urgency and power without legitimacy. Their danger stems from their possibility to coerce and even act violently. Mitchell, Agle and Wood (1997, 877) especially suggest the word "coercion" to describe these stakeholders as they often act

with illegitimate status. Examples of acts typical of dangerous stakeholders are unlawful protests and strikes, sabotage, and even terrorism. Dangerous stakeholders can therefore be dangerous not only to the organization and its managers, but other stakeholders as well. Identifying these groups may be unpleasant but failing to recognize them could prove even worse.

Definitive stakeholders, in a group of their own, are those who the managers perceive to possess all of the three attributes. They exhibit high salience to managers. As such, the claims by these stakeholders must be acknowledged and given priority to by the organization. A common occurrence is that a stakeholder that is dominant, and therefore already exhibits power and legitimacy, makes a new urgent claim. They then become a definitive stakeholder. As shown earlier, any other expectant stakeholder missing one of the three attributes may acquire it to become a definitive stakeholder. This may be through cooperation with another stakeholders, with internal changes of the stakeholder, or for example be provided by the managers. (Mitchell et al. 1997, 878.)

3.3 Stakeholders in the project context

The management of project stakeholders is essential for the success of a project. An essential component of this is to take into account the position of the stakeholders and assess their needs and claims on the project. A lot of the studies on the subject are on how to manage the stakeholders. What is more important in context of this thesis, and what requires some more research, is the "stakeholder side". That is why this chapter not only presented the model of categorizing the stakeholders, but also the model of stakeholder salience. (Aaltonen & Kujala 2010.)

Project stakeholder management in megaprojects can be a challenging task. As already mentioned in chapter 2, megaprojects involve multiple stakeholders from different backgrounds in their planning and management (Flyvbjerg 2014, 9). Megaproject managers often face challenges in identifying different stakeholders and assessing their needs. As the size of the project increases, so do these challenges. The accuracy of project managers' assessments usually decreases as the project grows larger and more complex. Maintaining the stakeholder relationships and balancing the stakeholders' claims is also harder in megaprojects due to the size and complexity. (Mok et al. 2015, 447.)

So far in this chapter the stakeholder theory has been discussed in relation to the vague term "organization". In this thesis, the theory of stakeholders and stakeholder salience is applied to projects, which are temporary organizations (Project Management Institute 2021, 4). They can therefore be examined like any other organization, and the stakeholder theory and its ideas can be applied to the context of a project as well (Aaltonen & Kujala 2010, 382). There are multiple definitions by scholars specifically on project

stakeholders, but also in general they all derive from the original definition by Freeman (1984). The broad definition in the project context by Project Management Institute (2021, 8) is “an individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.” This definition allows us to find the stakeholder groups and classes from stakeholder theory also in projects. The inclusion of the term “perceive itself to be affected” means we can apply the model of stakeholder salience and include for example the stakeholders without power or a legitimate claim (Mitchell et al. 1997). The same range of definitions from this very broad one to some very narrow ones exist also in project context, similar to those discussed earlier in the general context of organizations (Aaltonen & Kujala 2010, 382).

In examining project stakeholders, it is common in the analysis to make a division between internal and external stakeholders (Aaltonen 2011, 166). The stakeholder field in a project is a very diverse group, so this sort of categorizing can help. The group of stakeholders that have a contractual relationship with the client of the project are called *internal stakeholders*. They may also have a subcontract with another internal stakeholder. Since these internal stakeholders are often willingly part of the project coalition, they start out with a positive view of the project. They usually have power and legitimacy, as their claims are enforceable through contracts. (Winch 2004, 323.)

The other group is defined as *external stakeholders*. They can have either a positive or a negative attitude towards the projects. They don’t usually have legitimate claims on the project. Drawing from the salience model, this means these stakeholders often rely on others to enforce their claims. Below in Table 1 some possible project stakeholders are presented and categorized. (Winch 2004, 323.)

Table 1 Division of project stakeholders (Winch 2004, 323)

Internal stakeholders		***External stakeholders***	
Demand side	*Supply side*	*Private*	*Public*
Client	Consultants	Local residents	Regulatory agencies
Sponsor	Contractors	Local landowners	Local government
Financiers	Material suppliers	Environmentalists	National government
Client's employees	Employees of the above	Conservationists	
Client's customers		Archaeologists	
Client's tenants			
Client's suppliers			

As can be seen in Table 1, Winch (2004) further divides both internal and external stakeholders into two groups. Internal stakeholders are divided into those on the *demand side* and those on the *supply side*. On the demand side are the stakeholders most closely clustered around the client of the projects. Many different interests are present between these stakeholders. There is, for example, conflict between the client and its employees, and differing interests between the client, sponsors and the financiers.

The stakeholders on the demand side also have conflicting interests between the supply side stakeholders. On the supply side, the stakeholders satisfy their claim through the income received from the project, as well as the learning acquired through the project. The stakeholders therefore compete over the income stream from the project. (Winch, 2004, 324.)

In the group of external stakeholders, there is even more diversity. As mentioned above, the internal stakeholders usually support the project by default. External stakeholders, however, can have a multitude of attitudes towards the project. They may support the project, be against it, or be indifferent about it. On the private side of external stakeholders, for example locals can oppose a project such as a power plant due to its impact on their neighborhood. The opposite could also be true, for example they could support the construction of new services near them. On the public side, stakeholders such as governments could often be considered indifferent towards projects, as they are not particularly in favor of or against a certain project, as long as it follows their guidelines. This is not the case if the government wishes to encourage certain types of development, for example promoting clean energy. Then they could oppose a project to build fossil fuel infrastructure and support the construction of renewables. More active interests from

public external stakeholders also arise when they act as the project sponsor. There could be a conflict of interest when the party acts as the sponsor and a regulator at the same time. (Winch 2004, 324.)

The need to pay attention to external stakeholders is greater in context of large projects. Typical project research has focused mostly on economically impactful stakeholders. Projects should also consider their environmental and social responsibility. These issues are emphasized especially on large projects, as they often involve a diverse set of stakeholders from different backgrounds across cultures. (Aaltonen & Kujala 2010, 382.)

In addition to identifying the project stakeholders and categorizing them based on the internal – external -division, it is important in stakeholder management to examine the stakeholder claims, and their ability to enforce that claim. (Winch 2004, 325.) This relates back to the concept of stakeholder salience, which can also be used in mapping project stakeholders. The salience of a stakeholder depends on the three attributes of power, legitimacy and urgency (Mitchell et al. 1997). This is interesting in projects, since throughout this temporal organization, these three attributes can change. Stakeholders' positions in relation to the client in the project can change throughout the project. In addition to their position, the network and structure of the project also affect stakeholder salience. Stakeholders themselves can also engage in different types of ways to try and change their salience in order to influence the project. (Aaltonen & Kujala 2010, 381.) This change can then be examined to study stakeholders' salience during different points in the project timeline. (Aaltonen et al. 2015.)

For example, the stakeholders' chance to influence the project, and therefore their power, can change depending on whether the project is in the investment preparation stage, or is already being built. Aaltonen and Kujala (2010, 384) mention that especially secondary stakeholders usually have the most power at the beginning of a project. This is due to often having to evaluate different environmental and social impacts of the project when acquiring funding, as there are often regulations in place.

The perceived legitimacy of a stakeholder throughout the project lifecycle is often defined by accepted project management practices. It defines which stakeholders are legitimate at which points in a project. Legitimacy can change throughout the project through the action of the stakeholders as well. Especially in large global projects it is typical for external stakeholders, or institutions to which these stakeholders belong to, to evaluate the legitimacy of the project at different points in the project timeline. If some rules or even laws were not followed in the beginning phases of the project, external stakeholders could have been left out of the decision-making process because they were thought of having no legitimacy. If a case like this is found, it increases the legitimacy of these stakeholders at the later phases of the project. (Aaltonen & Kujala 2010, 384.)

In a project, the perceived urgency of a stakeholder's claim is also time sensitive. Firstly, those claims that are aligned with the current direction of the project are more

easily seen as urgent and implemented. Also, if a claim is presented right after an irreversible choice in the project has been made, it is likely not seen as urgent or dismissed entirely. This could for example be a claim for investment, which is made after the budget is already approved. On the other hand, a claim requiring major investment that is made before the finalization of the budget becomes more and more urgent as the final date for the budget approaches. (Aaltonen & Kujala 2010, 384.)

3.4 Synthesis of the theoretical framework

This chapter wraps up the theoretical framework of this thesis based on the two previous chapters, the literature review on megaprojects, and the stakeholder theories. Based on these a framework can be made to be applied to this case study about a megaproject and its stakeholders.

Megaprojects are large projects with huge costs and complexity. They cannot be managed simply as normal projects but bigger, as the added size brings more complex issues. The financial scale, long lead times, and crucially for this thesis, the involved multiple stakeholders make them a challenge to manage. (Flyvbjerg 2017.)

Megaprojects therefore face many challenges. The timelines and budgets often stretch far beyond the planned. Flyvbjerg (2014, 8) lists then characteristics that lead to these challenges: long planning horizons, inexperienced management, multiple stakeholders making decisions, uniqueness bias, overcommitment to an early idea, optimism bias and rent-seeking behavior, changing scope, “black swan” -events, unprepared budgets and misinformation about costs, schedules, benefits and risks.

Megaprojects still keep getting built. In fact, they are being built more and more, with increasing size and intensity (Söderlund et al. 2017, 5). With energy and especially electricity consumption increasing, these megaprojects are important in the energy sector. They are built to answer the increasing demands, and to replace aging energy infrastructure, as well as to answer climate goals by replacing fossil fuel -based energy generation with nuclear and renewables. (Brookes & Locatelli 2015.)

Megaprojects are also attractive to decision makers thanks to four sublimes, explained by Flyvbjerg (2014, 8). These are the technological, political, economic and aesthetic sublimes. Megaprojects often include new technologies, maybe even something that’s first of its kind. Building a one-off impressive structure is also appealing to politicians, since they garner so much media attention. The economic sublime refers to the economic benefits of megaprojects, that multiple stakeholders get to enjoy. Finally, the aesthetic sublime is felt by architects, designers, as well as normal people when they look at a unique product of a megaproject.

The challenges with the megaprojects being multi-actor processes with stakeholders from all backgrounds is where stakeholder theory comes in. With stakeholder theory, the multiple actors influencing and influenced by the megaproject can be identified and categorized. First the term "stakeholders" must be defined. One of the earliest and most used definitions is by Freeman (1984, 46). According to him a stakeholder is "*any group or individual who can affect or is affected by the achievement of the organization's objectives"*. There are many definitions that range from very broad to very narrow. This broader view is part of this thesis' theoretical framework, in order to most comprehensively identify all the stakeholders involved.

Stakeholder theory has three aspects, *normative, descriptive* and *instrumental*. Normative aspect refers to the study of how stakeholders should act. Descriptive focuses on studying how the stakeholders and managers act in reality, and how they see themselves. Instrumental stakeholder theory focuses on how the management can manage the stakeholders in order to maximize profits and stockholder value. The descriptive aspects of stakeholder theory are relevant to the theoretical framework of this thesis, once we investigate how the stakeholders are positioned throughout the project.

The normative stakeholder theory is used to identify and categorize the project stakeholders. Based on a list of common stakeholders by Friedman and Miles (2006), the first list of stakeholders searched for in this thesis is made. This is then later expanded based on the parties that appear in articles about the case project. The stakeholders discovered are categorized according to the project stakeholder categories by Winch (2004). Stakeholders are divided into internal and external stakeholders. They are then further divided into demand and supply side internal stakeholders, and private and public external stakeholders. This is done over the course of the case megaproject, examining how these stakeholders change when the project progresses.

Back to the descriptive stakeholder theory, the categorized stakeholders are then analyzed based on salience. The idea of stakeholder salience by Mitchell, Agle and Wood (1997) studies the stakeholders' claims and their ability to enforce them. Salience is the sum of three aspects: *power, legitimacy* and *urgency*. The stakeholders are placed into categories depending on which of these three attributes they possess. These can change at any time, for example a stakeholder can receive legitimacy, moving to another category of salience. This leads to the final part of the theoretical framework, in which the stakeholder salience is examined over the course of the project.

The following chapter explains how the case study is carried out, how the data is collected, and then analyzed. The framework presented in this chapter can then be used to further analyze the findings, comparing how the case project follows the megaproject literature, and how the discovered stakeholders match the stakeholder theory and what their salience is like.

4 METHODOLOGY

This chapter presents the research methodology chosen for this study. The research process is cyclical and iterative. Therefore, the methods chosen are not set in stone at the beginning of the research process, but rather the process itself affects the choices made. By its very nature, this follows an inductive research philosophy, aiming to find new themes and theories from the project studied. The following methodology is therefore chosen to fit both the aim of the study, as well as the data of the study.

First, the qualitative research approach and more specifically the case study design are presented and justified. The case studied is also briefly presented. Then the methods with which the research material is collected are presented. The source publications of the studied articles are also described to better understand the data collection. After collection, the articles are categorized and analyzed to answer the research questions. Methods used in this analysis are presented. Last is a brief yet important sub-chapter on evaluating the trustworthiness of this study and discussing the possible limitations of the methodology.

4.1 Research approach

Since the research question of this thesis is "*How do stakeholders and their positions change throughout an infrastructure megaproject?*", and the aim of this study is to understand a very complex issue involving many moving parts, I've chosen to conduct a qualitative study, rather than a quantitative one. As the word *qualitative* implies, this form of research focuses on those qualities and processes that are not measured or examined in simple quantitative ways (Denzin & Lincoln 2011, 8). These are present especially when trying to understand reality and its complex socially constructed variables. Qualitative research deals with interpretation and understanding, rather than testing hypotheses and statistical analysis. (Eriksson & Kovalainen 2016, 4.)

As mentioned, this study focuses on stakeholder relations. I would argue that something that complex, involving multiple parties with their own interests and opinions, would be tough to make sense of with numbers and a quantitative study. Denzin and Lincoln (2011, 8) also point out that quantitative research focuses mostly on variables, not processes. In this study, the processes are what I'm interested in.

There are many ways of conducting qualitative research. Each different research strategy has its own strengths and weaknesses. The advantages and disadvantages of these different methods complement each other. I've chosen to conduct an intensive case study. An intensive case study focuses on studying a single case intensively; other forms of case studies can, for example, compare two cases to each other. The following chapter explores

the case study as a method, and presents the case chosen for this intensive case study. (Yin 2014, 4.)

4.2 The Case Study

Yin (2014, 9) mentions three criteria on which to base the selection of the research method. One criterion on which to base the selection of the research method is the form of the research question. Case study is best suited for "how" and "why" -questions. As a contrast, a survey would be better for "who", "what" and "where" questions. My research question supports the use of case study, but this alone does not immediately warrant the choice of case study as my method. Another criterion mentioned by Yin, the focus on contemporary events, weighed even more in my selection of the method. This thesis focuses on a very contemporary event. So, in summary, case study is chosen as the preferred method, because this thesis is trying to answer a "How"-question, and is focused on contemporary events, of which a researcher has no control over.

The chosen case for this thesis is the project Olkiluoto 3. This is the project to construct a third nuclear power plant unit to Olkiluoto, an island in Eurajoki, Finland. Two nuclear power plant units, Olkiluoto 1 & 2, are already located in Olkiluoto and are owned by Teollisuuden Voima Oyj, often abbreviated as TVO. It is a Finnish company, owned by other Finnish companies, for example industrial companies, to whom it provides electricity. The investment decision was made in 2003, and construction started in 2004. After many delays, Olkiluoto 3 began producing electricity commercially in April 2023. It is meant to stay in operation for at least the next 60 years. (TVO 2024.)

The Olkiluoto 3 reactor is of new type, EPR (European Pressure Reactor), and was meant to be the first of its type. Due to delays, a Chinese EPR type reactor was finished first. The net power of the new reactor is 1600 MW. It is the third most powerful nuclear power unit in the world.

Olkiluoto 3 was ordered from a consortium of suppliers. The project is carried out as a turnkey project, meaning that this consortium, the turnkey contractor, is responsible for the project construction and delivers it to the client, TVO, when finished. They include French AREVA and German Siemens. This means that Olkiluoto 3 was also internationally significant, and the project included workers from over 80 nationalities. At its peak, the project employed about 4500 workers simultaneously. (TVO 2024.)

The project included contemporary themes such as climate and energy security. The project decreased the part of non-renewable energy in Finland and also decreased the amount of imported electricity. All three units in Olkiluoto together produce 30 % of the energy consumed in Finland. (TVO 2024.)

All these factors make Olkiluoto 3 a truly unique and interesting case to study. The scope of the project makes it a true megaproject, being one of the most expensive projects of all time. The international aspect is also present, as is contemporary themes of climate change, and dependency on foreign energy imports. Such a project is sure to include multiple different interesting stakeholders with different interests and motives. (TVO 2024.)

As Flyvbjerg (2011, 301) notes, a case study is rather hard to define, and many commonly used definitions are misleading or outright problematic. Many common definitions specify that a case study is a way to study a single example of a phenomena, as an individual unit. This suggests that a case study only serves as an "introduction" to a larger inquiry. These types of definitions argue that a larger sample is required to study the broader phenomena. Theres also the problem of defining a case study as an investigation into some sort of a separate entity. It is true that the researcher draws the boundary on what is defined as the case, but what is left outside the boundary becomes the context of the case, and case studies specifically focus on the relationship between the case and its environment.

Hartley (2004, 323) describes case study as consisting of "a detailed investigation, often with data collected over a period, of phenomena, within their context". This is already a much better definition, also in the context of this thesis. It highlights some important features of a case study: Its relation to the context, as well as the importance of studying the case's evolution over time. Yin (2014, 16) gives a twofold definition of case study:

1. A case study is an empirical inquiry that
    - investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when
    - the boundaries between phenomenon and context may not be clearly evident
2. A case study inquiry
    - copes with the technically distinctive situation in which there will be many more variables of interest than data points
    - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion
    - benefits from the prior development of theoretical propositions to guide data collection and analysis

This list is essentially the core of this case study and covers the main themes of this research. The environment and context of the case is in the core of the study, and the prior

literature directs the methodological choices, and then later ties the findings to existing theory.

4.3 Data collection

In social sciences, there are multiple different ways of collecting data. As this is a qualitative study, the data collected for this study is so called soft data. Soft data consists of words, impressions, sentences, photos and so forth, as opposed to hard data which is in numerical form. (Neuman 2003) Collected data can be one of two types: primary or secondary. Primary data is collected for the specific research question, using methods that best fit the research problem. Secondary data, however, is data that has been collected previously for some other use and is now used in the research. (Hox & Boeije 2005, 593.)

This thesis relies on secondary data. Tuomi and Sarajärvi (2018, 96) further divide this data to two types: private documents and documents that are part of mass communication. This thesis uses the latter. Using such available data can lead into insight of the relations and opinions of the studied subjects, rather than a "diagnosis" or the objective truth. The data is in the form of media texts, more specifically articles in online newspapers. Yin (2014, 105) also lists documentation as one of the most commonly used sources of case study evidence. According to him, there are multiple strengths to using documentation as case evidence. It is stable and can be reviewed multiple times. It is also unobtrusive, meaning that since it is created for other purposes before the study, retrieving and reviewing it does not impact the studied case itself. It is also both specific and very broad. Documentation like news includes exact names, times, and other detailed references. But it is also broad in that it can cover a long timeframe, and many events from many perspectives.

According to Hox & Boeije (2005, 593), one of the main reasons for using secondary data is to ask new questions to an existing data set. The online articles and news that this thesis relies on have been originally published for different reasons, but they include a lot of insight into the studied case, as well as its stakeholders. There's also of course a large practical benefit to using secondary sources in a study like this. Instead of having to interview or survey many parties involved in the project again, it is efficient to use the already existing interviews. It would be very unlikely that the already interviewed parties would give any new information to the researcher interviewing them again anyway.

As Yin (2014, 17) mentions, in case study multiple sources of evidence are used. Eriksson and Kovalainen (2016, 138) agree that "case studies are considered more accurate, convincing, diverse and rich", if instead of only one source of data, they rely on multiple sources. This allows for data triangulation. Cross-checking multiple sources with one another allows for a more objective view of the case. This thesis tries to comply with

this belief and therefore uses three separate sources for online articles. The chosen sources are the online news sites of Yle, Kauppalehti and Helsingin Sanomat.

Yle, short for Yleisradio and translated to English as "Finnish Broadcasting Company", is a Finnish state-owned public broadcasting company. Yle broadcasts three television channels, and eight radio channels. In addition, they have their own online news site yle.fi. Yle News, a department part of Yle's News and Current Affairs, reports Finland's national and international affairs. News is broadcast on their television- and radio channels, and written articles are published on their web page. The web page has a good search function, which was used to find the articles studied. Themes that Yle News reports include politics, finance, culture, current affairs, as well as everyday life topics. A separate department, Yle Regions, reports regional news and current affairs, and these articles can also be found from Yle's site. I chose Yle as the first source to get articles from, as it has a good volume of articles that cover a wide range of topics. I also consider Yle to be quite neutral, being the state media. Starting with Yle also meant that the two other publications could then expand on what was already found in Yle, because the other two media are not as general and neutral. (Yle 2024.)

Kauppalehti is a multichannel news outlet owned by the Finnish media company Alma Media. It markets itself by stating: "Finnish decision-makers read Kauppalehti". It publishes online- and mobile news, as well as the Kauppalehti newspaper. It is the leading financial news media in Finland. Kauppalehti was chosen as a source due to its focus on business, economics and finance. It would hopefully expand on what was found from Yle articles, by providing more insight into the finances of the project, as well as its economic impacts. It would possibly also include some stakeholders not yet found in the Yle articles.

Helsingin Sanomat is an independent newspaper, and the largest subscription newspaper in Nordic countries. It is owned by Sanoma. It is published daily in physical form and also has an online version. Due to being a politically independent newspaper, historically significant, and having such large circulation, one could consider Helsingin Sanomat to be a Finnish newspaper of record. This significance is part of the reason for choosing it as a source. It also compliments Yle and Kauppalehti. Helsingin Sanomat includes many opinion pieces and letters to the editor, that are not present in Yle articles. These provide direct looks into the opinions and positions of stakeholders on the project.

The articles were gathered by using the search -function each site provided. Search term used is "Olkiluoto 3" for all publications. AND -operator is used to remove as many off-topic results as possible. Meaning that older articles, that mentioned for example only the earlier power plant Olkiluoto 2, or simply the geographical area of Olkiluoto with no relation to this new project, would be left out. However, this search term is still extremely vague and large. This could be seen as an oversight and a hinderance to this thesis. I however argue that the use of such vague search term is beneficial, and even necessary

considering the research question. All articles related to Olkiluoto 3 could potentially include interesting stakeholders. To find as many of them as possible, we need a vague search term.

When performing the search with the chosen term, the total number of articles showing up was noted to be later used in the analysis. The articles that were downloaded and then analyzed in depth were then chosen from these results, based on whether they included interesting views or new topics not discussed in other already downloaded articles. To help follow the research question, and what exactly this study is interested in, the operationalization table, shown below in Table 2, is a useful tool. Articles that included or referenced to the themes for analysis were included, and those that missed the themes and the sub-questions of the study were dismissed. This table also later aids in analysis, in choosing codes and categories for these codes to sort the found data into.

Table 2 Operationalization table

RESEARCH QUESTION	SUB-QUESTIONS	FRAMEWORK	THEMES FOR ANALYSIS
How do stakeholders and their positions change throughout an infrastructure megaproject?	How does a megaproject progress?	Literature review	Infrastructure projects
			Megaprojects
			Challenges
		Timeline	Delays
			Deals
			Advancements
			Outside events
	Who / What are the initial stakeholders in a megaproject?	Stakeholder theory	Companies involved
			Political decision-makers
			Third party
	How do the stakeholder relations differ from the original state?	Stakeholder theory / stakeholder salience	New stakeholders
			Stakeholders exit
			Changing position of stakeholders

A common problem when collecting data for a study is to know how large amount of data to collect. It is important to have a large enough sample size for the study to be scientific and so that generalizations can be drawn from it. This same problem applies both to quantitative as well as qualitative studies. However, often the correct amount of data is harder to define clearly in the case of qualitative study. In a qualitative study such as this thesis, the choice of sources of data is not random, but carefully considered. The number of sources can be quite small, but the sources selected are ones that can provide the most and the best insight into the studied case. These principles have been followed in this thesis. Only three sources are selected, but they have been carefully considered to be able to provide clear and abundant data. (Tuomi & Sarajärvi 2018, 97–99.)

When choosing how many articles to pick for analysis from each source, the principle of saturation was followed. In studies, saturation means the point at which the studied material begins to repeat itself. The idea is that there is a certain amount of data that, when studied, shows all the possible basic information there is to get from the case studied. Generalizations can be drawn even from a small sample size, when the research material starts to repeat itself. This principle does not fit every study. The researcher has to decide whether they are searching for repetitiveness and generalizations, or outliers and differences. This thesis aims to find the timeline of the project, as well as repeat themes and form generalizations. Therefore, saturation is a good indicator for the right amount of research material for this thesis. This study has themes selected for analysis based on the literature review and the theoretical framework. When the preset themes are all found in the research material, one can argue that saturation has been reached. When going through the search results, many articles were left out of the analysis, because they included the same exact news, or themes, that was already found and analyzed from another source. (Tuomi & Sarajärvi 2018, 99.)

I then went through the search results from the earliest to the latest. The data collection was done in two phases: First articles were collected from the online site of Yle, and the collection of articles from two other online newspapers, Kauppalehti and Helsingin Sanomat was only done after that. The method for searching for all the relevant articles from each site was identical, but the choice of articles for analysis from the two publications from the second phase was influenced by the articles already chosen from Yle. As mentioned above, if the exact same news was found in an Yle article, I wasn't going to download and analyze the same thing again found in a Kauppalehti or Helsingin Sanomat -article. There were still plenty of articles from these latter two sources to analyze, thanks to them both having an emphasis on their own kind of interests, whereas Yle is more general.

Considering the timeframe from which the articles are collected is also crucial. As mentioned, I went through the articles from old to newest. Rather than set a start date for

the search, I decided to search when the first articles found with the term are published. This provides some interesting information of the timeline of the case. As for the end date of the timeline studied, and what would be the last articles studied, I chose the end of June 2023. This is again one of the products of the cyclical study process. The “end date” of the project is hard to define, but the starting of the power plant and the beginning of the commercial use is a pretty good date. However, when analyzing the articles, it became clear that some very interesting ones with good insight were published right after the project’s completion. This is why I chose to extend the analyzed timeframe a bit, a few months after the completion. No doubt even more articles would be written about Olkiluoto 3 even after June 2023, but the end date has to be set somewhere.

4.4 Data analysis

Even though data collection and data analysis are usually, and also in this thesis, mentioned as two separate processes, in reality these two are rather hard to separate from each other. Especially in case studies, analysis begins very early into the research process. For example, some analysis already happens when collecting the data. In this case when going through the search and skimming through the articles picking ones for the analysis, some analysis is already happening. The more in-depth analysis was done after the research material was collected. The methods of data analysis vary greatly depending on study aims. The methods for this analysis are chosen based on the research problem, and what questions this thesis wants to answer. Also important in choosing the methods is the type of data collected, and in what form it is in. (Eriksson & Kovalainen 2016, 132–140.)

The overall method of analysis used in this thesis can be categorized as qualitative content analysis. Content analysis is one of the most common analysis methods usable in almost every type of qualitative research (Tuomi & Sarajärvi 2018, 103). Qualitative content analysis, as the name suggests, focuses on the content of the data. In other words, what is said and done in the data, and being qualitative analysis, also how it is said and done, and why. Content analysis can also refer to a type of analysis where qualitative data is transformed into variables and then analyzed with quantitative methods. This thesis uses specifically the qualitative content analysis, which is not to be confused to the aforementioned traditional content analysis, even though this thesis may refer to the used method only as content analysis (Eriksson & Kovalainen 2016, 119).

This type of qualitative content analysis can be done to varying forms of data. It is suitable for analysis of text, audio and visual data. Like this thesis, the aim of qualitative content analysis is to produce a detailed description of the studied phenomenon as well as its context. This study benefits from such an approach to analysis, as the big picture of

the case and its relations are at the core of the research problem. (Eriksson & Kovalainen 2016, 120.)

According to Eriksson and Kovalainen (2016, 122) there are two ways of doing qualitative content analysis, categorization and interpretation. The chosen method for this thesis is categorization. The first step is to form the coding units. This thesis uses both key words to find the shareholders and events, and themes to find the specific issues that come up in the articles. These coding units are then categorized. Categorized coded data is then analyzed by comparing, summarizing and searching for trends.

The first step, choosing the codes, is influenced by many factors. Yin (2014, 136) offers four general strategies for qualitative analysis that influence how the codes are chosen. The first two strategies that contrast with each other are either to rely on theory, or to work from data to theory. In other words, this choice of strategy influences whether the analysis units, and codes, stem from theory, or whether they are formed only after examining the data. This thesis uses the theoretical framework of categorizing stakeholders in forming the codes, but new codes are also found from the research material, and the final codes are chosen to specifically fit it. Therefore, this thesis' analysis strategy is a mix of these two propositions by Yin.

Tuomi and Sarajärvi (2018, 109) give list three forms of qualitative analysis, two of which resemble ones suggested by Yin, as they are also inductive and deductive in regard to forming the analysis units. However, they also suggest a third method of analysis, where the final codes are derived from the empirical data, but their choice is directed by theory, and they are compared to the theoretical framework. The aim is not to test the previous knowledge and theory with the codes but rather find something new. This is the analysis strategy this thesis follows.

The coding was done in two phases. First, the material was coded with the first preliminary codes that were derived from theory. During this process, new codes and themes kept coming up in the analyzed articles. The codes were then added, and some changed, and a new coding pass was made.

The final codes chosen for the coding process are based in the theoretical framework and then influenced by findings from the articles themselves and formed in such a way that they accommodate the found themes and stakeholders. The theoretical framework discussed earlier aids in picking fitting codes for the stakeholder groups, and in categorizing them. After categorizing, the codes are represented in a tree-like hierarchy, shown below in Figure 3.

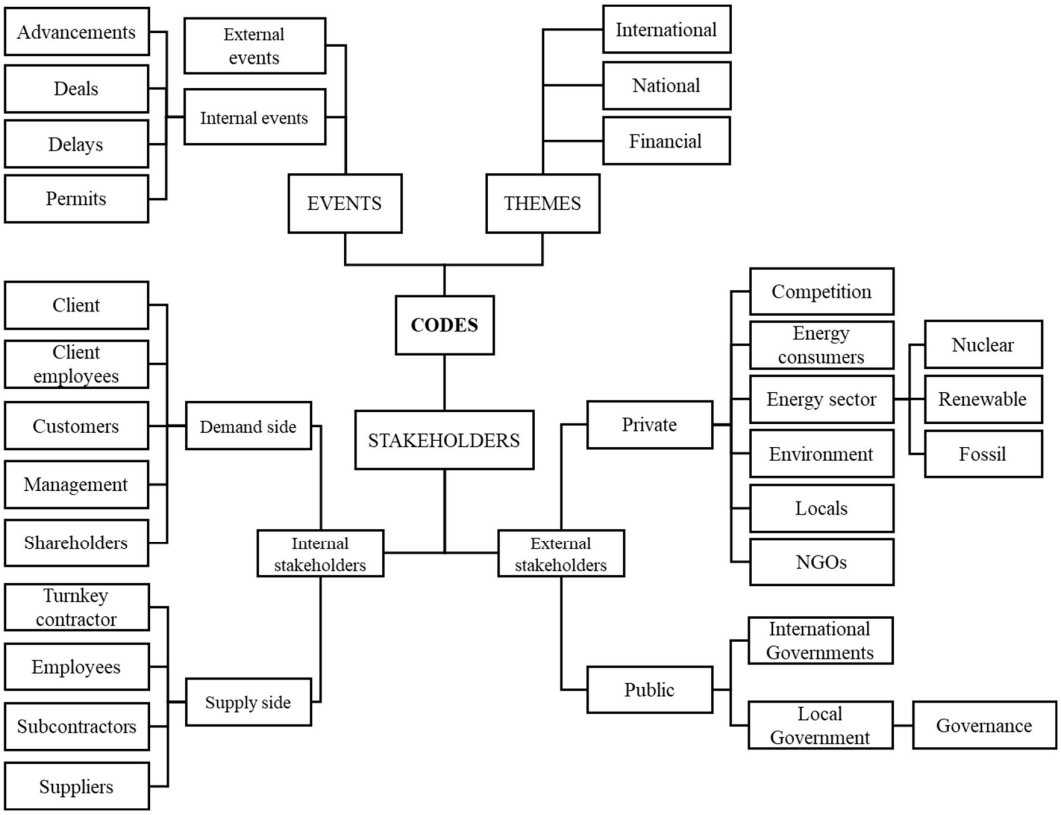

Figure 3 Used codes in their hierarchy

The main categories of codes are EVENTS and STAKEHOLDERS. These two then include multiple more specific codes. For events, internal and external ones are separated. Internal events include more easily specified events such as delays and advancements, and outside events include events not directly related to the project, but that had an impact on it or vice-versa.

The EVENTS -codes are used in the very first part of the analysis, that is forming a timeline of the project. This timeline is formed based on the found most critical events. This timeline is then used to form different timeframes using temporal bracketing. Since time is such an important factor in the research questions, this must be done first in order to be able to place different stakeholders and their interests on specific points in time. Such analysis of changing themes and variables over time is especially suitable for case studies, and even better for intensive case studies specifically. (Eriksson & Kovalainen 2016, 125.)

For the stakeholders -category, the names of codes are derived from stakeholder theory, but what stakeholders fit into each category is slightly tuned based on the case in question, and the found stakeholders. If a stakeholder or theme didn't exactly fit one code, it was coded to the nearest one. For example, the "competition" -code includes articles which reference other similar megaprojects, to which the case project is compared to. The

energy sector is separated from them with its own code. This is further divided into fossil, renewable and nuclear. The customers were harder to code than in a normal company. On the demand side, the customers are the direct customers of the client. On the external side, the code Energy consumers is used for the end customers of the electricity produced by the project.

Additional codes are included to further categorize the articles. Codes CHANGE, ENTRY and EXIT are used to code articles that include new stakeholders entering, and existing ones changing position or exiting the project. A code for themes of stakeholder salience was also used, to later better find articles that included themes that might affect stakeholder salience. Codes “international” and “national” defines which type of issues the article is discussing, in order to aid in further analysis. While going through the first round of coding, a reoccurring theme or finance -related articles was found. A code for these articles was added to later be able to find and analyze them easier. These also aid in analyzing the articles for different kinds of events. For example, financial events such as funding rounds, or whether the event is international or something happening in Finland.

4.5 Evaluation of the Study

When choosing the methodology and conducting a study, it is important to consider the trustworthiness of these methods, and the data and results provided in the study. This sort of evaluating should be done continuously throughout the research process, rather than at the end just “looking back” at the work done. Adopting set criteria for evaluation leads to more transparent and higher quality research. (Eriksson & Kovalainen 2016, 303)

Evaluating trustworthiness can be especially difficult in qualitative studies. The quantitative criteria do not apply. For example, there is no clear numerical indicator to how many data points are needed in qualitative study. Evaluating qualitative research is not entirely different though, as the used criteria are adapted from quantitative ones. (Eriksson & Kovalainen 2016, 304.)

According to Eriksson and Kovalainen (2016, 305), a classic framework for evaluating qualitative studies includes three concepts: reliability, validity and generalizability. These are basic concepts used in business research evaluation. Lincoln and Guba (1985) further expanded upon this idea dividing the evaluation into four criteria: *credibility*, *transferability*, *dependability* and *confirmability*. These aspects together make the concept of *trustworthiness*. In this thesis I’ve chosen to use this framework in evaluating the trustworthiness of the study.

The first criterion, *credibility,* relates to how confident the reader can be in the truth value of the findings. Has the researcher truly familiarized themselves with the research area from multiple viewpoints? This relates to objectiveness, and whether another

researcher could come to the same conclusions using the original researchers' materials. This research includes multiple sources and takes into analysis articles with viewpoints from multiple different stakeholders and outside observers. This increases objectiveness. The chosen sources can also be considered rather objective, as they report news without specific agenda, and don't have stake in the project themselves. (Lincoln & Guba 1985.)

There are some aspects of the study that could have been done differently to improve credibility. Even though triangulation was used, and the data was collected from multiple sources, all sources were of the same type, online newspaper articles. Eriksson and Kovalainen (2016, 139) mention that specifically in case studies it is often beneficial to mix different types of data sources. For example, conducting interviews could have been beneficial to this case study. One counterpoint is though, that many involved in the project have already been interviewed, and these interviews are found in the articles studied. It is unlikely that, for example, a spokesperson for the project company would've given any new info that they haven't already given to the newspapers.

Another limitation is the reliance on purely Finnish media. This could hurt the objectiveness of the study. For example, French publications could've included more viewpoints by the French stakeholders. This issue is thankfully somewhat mitigated by the chosen Finnish publications being objective, and such that they report also international news.

Transferability of the study means that the study and its findings can be related to other research and previous concepts. The case studied is a monumental project in the field of nuclear energy. Transferability of the findings from this project is increased by the fact that this project uses technology that is used in many following projects in the same field. Being the most expensive and one of the largest construction projects of its time means that it is also relatable to other megaprojects. The findings themselves are also linked to previous theory, where the field itself is not relevant. The stakeholder categories weren't remade for this study, only adapted, and therefore the findings are applicable to many other types of megaprojects. (Lincoln & Guba 1985.)

An argument could be made that the *transferability* and even the *credibility* of these findings is hindered by the fact that only one case was studied. Siggelkow (2007, 20) provides a counterargument that is also fitting to this thesis. Imagine you come upon a talking pig. When you researched this unique sample, would reviewers of the study then say: "well that's just one pig, show me a couple more and this research is significant"? That would be rather silly, and I believe in Olkiluoto 3 we have a similar truly unique case that is worth studying.

The research is *dependable*, if the research process has been logical and responsible so that the same results could be replicated by another researcher. The data is collected from sources that anyone can access, but at later points these online articles could become inaccessible. Still, the facts represented in the articles, and the interviews and statements

given by the stakeholders would not change and would possibly still be accessible through other means. The data is collected systematically and analyzed through very clear, quite common processes, so I believe the criterion of dependability is fulfilled. This research design chapter shows how systematic the research process has been. (Lincoln & Guba 1985.)

This systematic and clearly documented research project helps in proving the final criterion of *confirmability* is met. It means that the data and findings are understandably linked without there being influence from the researchers' own bias. Even though I as the researcher am in some way a stakeholder of the project being a Finnish citizen and a customer of the Finnish electricity grid, I have no stake at the outcome of this study itself. Some bias also exists due to the researcher being subject to the many news, articles and opinions in the media about the project over the years. In other words, the researcher already had a certain perception of the case project beforehand, due to being interested in the field and this specific project for a long time. This did not influence the analysis, as the articles were collected in a systematic way, and the analysis was done as objectively as possible, abandoning prejudice. (Lincoln & Guba 1985.)

In addition to trustworthiness, it is also important to evaluate that the research is ethically acceptable and reliable. This requires following the Finnish Code of Conduct for Research Integrity by TENK (2023). The basic principles of research integrity are derived from The European Code of Conduct for Research Integrity by ALLEA (2023). These principles include reliability, honesty, respect, and accountability. Good research practices must be followed to meet these principles and to conduct ethically acceptable research.

This study has followed the guidelines for Research Integrity set by TENK (2023). The study has been carried out carefully and thoughtfully from the beginning to publication. Since the data used in the study is from secondary sources, many of the toughest ethical considerations concerning possible interviewees and permits were not present as no personal data was handled in this study. All the data used was openly accessible. The process of choosing the sources and the studied articles is discussed openly. The processes in categorizing and analyzing this data are also described in detail. The articles downloaded are not modified and are stored and analyzed as they appear in the publications.

5 FINDINGS

This chapter presents the findings of the study. The aim is to first give an overview of the data set that has been collected by the methods explained in chapter 4. This data set will then be used to seek answers for the research sub-questions. The themes of the chapters below reflect that and are chosen so each answers a specific sub-question.

5.1 Overview of the data set

As previously mentioned, the data set was collected from secondary sources. Three Finnish online publications were used. These were Yle, Kauppalehti and Helsingin Sanomat. In the upcoming text and some tables and figures, these will be abbreviated to Yle, KL and HS respectively.

The original data set was collected by searching with the keywords “Olkiluoto 3”. Below in Figure 4 we can see how many articles in total were found by this method from each source, by publication year.

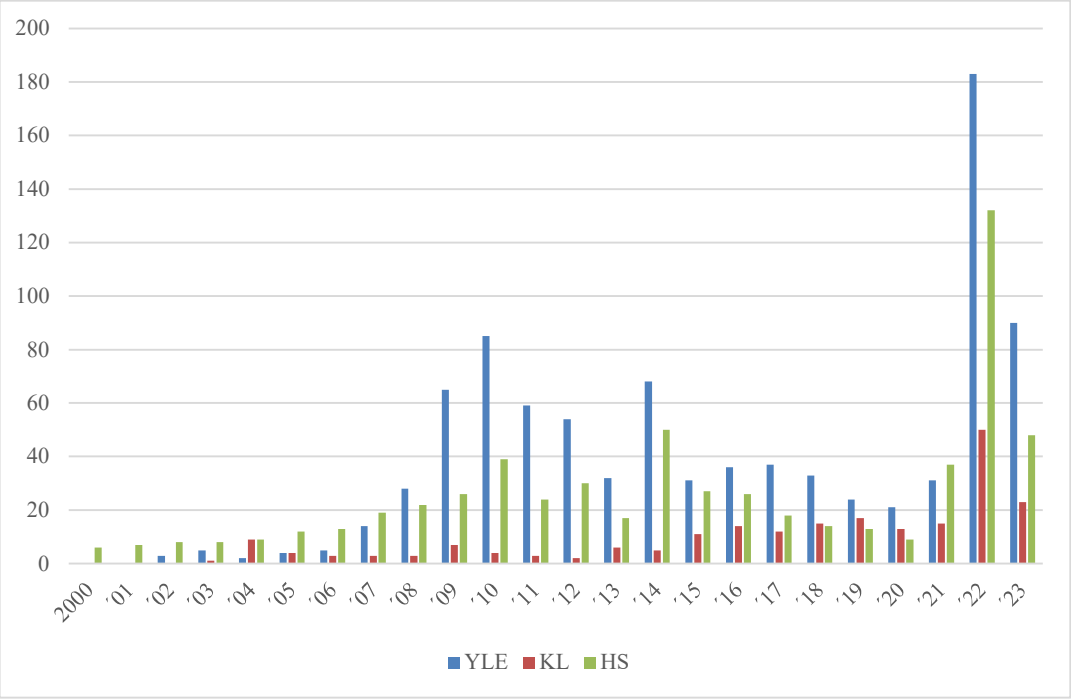

Figure 4 Total number of articles found by publication

As we can see, the first articles found by the search are from the year 2000. For the first years, only a few articles are found, but the number of articles increases after that.

After the initial increase in the volume of articles around the year 2007, the amount does not seem to follow any linear or exponential increase.

What is more notable is the difference between the publications. It is clear that Yle had the highest volume of articles at 910 total articles found. Kauppalehti had the fewest with 220, and Helsingin Sanomat was in the middle with 614 articles total. These findings support my initial idea of using Yle as a high-volume source of articles, to find the larger trends. After that the other two publications can be used to find deeper insight into the issues identified from Yle articles.

The total number of articles found with the search term “Olkiluoto 3” was really high at 1744 articles found from all three publications. The number of articles had to be filtered down to something more manageable. Duplicate articles were the first ones to be discarded. Many times, for example Yle would report on a topic, and that article would then be reported on Kauppalehti or Helsingin Sanomat with a reference to Yle. There were also some articles that made no sense to come up with the search term but still did. These articles that had no relevance towards the case and didn’t even mention it were also discarded.

Articles were then divided to those that were “off topic” and “on topic”. Even though the search was done by searching for “Olkiluoto 3” exactly, many articles still had nothing to do with the research topic. This does not mean that any articles that didn’t directly and only talk about Olkiluoto 3 project were discarded. Already at this stage of structuring the data, a lot of thought was placed on the research question and sub question. “Is the article relevant to any of the research questions” is one of the ways to describe this selection process. For example, there were articles that focused on other similar nuclear projects, such as Olkiluoto 4, or the other already existing Olkiluoto reactors. For example, many of the off topic 2020 articles were about the issues of Olkiluoto 2 reactor, and Olkiluoto 3 wasn’t even mentioned. But some of the articles about the license for Olkiluoto 4 in 2014 were deemed on topic, since they offered interesting views into projects similar to the one studied, and even directly mentioned, how Olkiluoto 3 effects the license for future projects like Olkiluoto 4.

Table 3 On topic articles by publication

Year	YLE	KL	HS
2000	0	0	1
2001	0	0	0
2002	2	0	1
2003	4	1	3
2004	1	9	6
2005	2	4	6
2006	5	3	5
2007	8	3	6
2008	24	3	9
2009	37	7	7
2010	39	4	10
2011	30	3	8
2012	26	2	14
2013	18	6	12
2014	27	5	22
2015	13	11	7
2016	25	11	21
2017	22	11	11
2018	16	11	6
2019	8	16	7
2020	7	8	4
2021	13	12	12
2022	60	33	41
2023	36	18	26
TOTAL	423	181	245

In Table 3, the number of articles after the initial filtering is shown. When compared to the total number of articles, Helsingin Sanomat has the most off topic articles. Only about half of the Yle articles were on topic. In contrast, Kauppalehti has the highest amount of articles on topic when compared to the total amount of articles. Of the Kauppalehti articles 181 were on topic, which amounts to 82,3 % of the total articles. For Yle and Helsingin Sanomat, these percentages were 46,5 % and 39,9 % respectively.

This number of articles was still too high at 849 on topic articles total. For the scope of this thesis, it was not reasonable or even necessary to code and analyze all these articles. In addition, many of these articles were still discussing the same topic, and there was a lot of overlap between articles of different publications.

Table 4 Number of articles coded and analyzed

Year	YLE	KL	HS
2000	0	0	1
2001	0	0	0
2002	2	0	1
2003	4	1	3
2004	1	7	5
2005	2	4	6
2006	5	3	6
2007	3	3	6
2008	4	2	6
2009	5	5	5
2010	5	3	4
2011	4	3	4
2012	5	2	3
2013	5	6	3
2014	5	4	4
2015	5	6	2
2016	4	5	3
2017	5	6	3
2018	4	6	2
2019	5	5	2
2020	4	5	2
2021	6	5	7
2022	8	5	7
2023	11	5	7
TOTAL	102	91	92

In Table 4, the final number of downloaded, coded and analyzed articles can be seen. The aim was to get about five articles per publication per year that are interesting and relevant to the research question. Some years there were fewer articles available, and then some other years there were more than five articles that were so relevant they shouldn't have been discarded. Therefore, the total coded and analyzed data set comes to 285 articles. This is 16,3 % of the original 1744 articles that came up with the search term.

5.2 Evolution of the case over time

This chapter includes findings relevant to answer the sub-question: "*How does a megaproject progress?"*. To answer this, a timeline with the critical events of the case Olkiluoto 3 is created. This is a natural first step in understanding the case and how it has

evolved. This is of course useful in answering the other sub-questions as well, as they too involve a time component. The timeline will aid with understanding what exactly is the "initial state" mentioned in one of the sub-questions. It will also help in identifying the key moments and progress of the project, to help in selecting the time frame that we inspect the changes of the stakeholders and their relations in.

Creating a basic understanding of the timeline of Olkiluoto 3 project was quite easy, as the three publications all included at least one article with a timeline of the project. Long detailed timeline articles were found that summarized the important events. The project spanned such a long timeframe that the later articles that were not primarily about the project events often included some recap and background information of the project in the article, just to help the reader follow what has happened in the project.

The first article downloaded for analysis from Yle, published 21.1.2002, included a timeline of events up until 2002. This includes background information such as how the decision for the new power plant was made, and how the permits were granted. Kauppalehti included four articles with timelines, published in 2017, 2019, 2020 and 2023. Helsingin Sanomat had three, published in 2014, 2018 and 2023. The two timelines from 2023 were written after close before and after the completion of the project. They were used as the basis of the timeline and the other articles then provided more direction in finding some events that were not present in the two largest timeline articles.

The actual events included in the timeline were all discovered and confirmed from the articles on these events themselves, so not only based on the timeline articles. As mentioned, to aid in discovering these events, the articles were coded for them. Under the code events the articles were further coded more specifically to external or internal events. The internal events code was further specified into four codes based on the events that kept appearing the most in the articles based on the first coding run. These four types of events were Advancements, Deals, Delays and Permits. The number of articles coded to each of these Internal events by year can be seen in Figure 5. It shows how certain codes are more frequent at certain times.

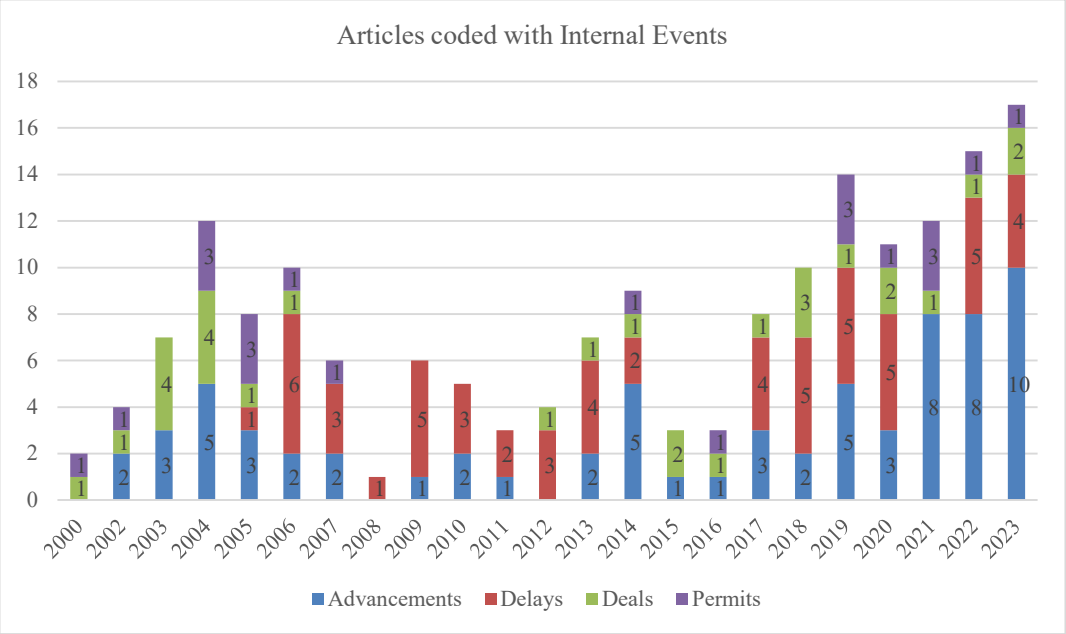

Figure 5 Number of articles coded with the codes under Internal Events

Advancements coded articles mention advancements in the project, for example when part of the project is built, or when the project moves into a new phase. In total 69 articles were coded to include advancements. As can be seen in Figure 5, out of all the events, this was coded to most articles. One explanation of this frequency can be found from the last articles from the time the project was about to be finished. Articles from 2021 to 2023 account for 26 of the coded articles. Out of the Advancement coded articles 33 were from Yle, 20 from Kauppalehti and 16 from Helsingin Sanomat. This is logical, as mentioned the first coding run was done for the Yle articles, and then when an article with the exact same topic was found on KL or HS, it was ignored.

The Delay -code was coded to 58 articles. This means that more articles mention advancements than delays, which knowing the project's public image is quite interesting. The articles analyzed reflect this image, with multiple headlines mentioning delays, and even an article with a compilation of all the delays the project has had. The first delay was reported in a 2005 article, in the same year construction began. The first delay announced by the project managers was in 2006, which was also the first time the completion date was changed. After that, at least one article per year mentioned delays. There's a noticeable spike in 2009 and in 2018 in articles coded with Delays. Both times the project was officially delayed and the completion time changed.

Originally on the first coding run, the Advancements and Delays codes were the only specified Internal events. However, it became clear that Advancements as a term was too broad, and two other types of events were identified to be occurring. Deals -code was created to refer to articles which included topics such as deals with new suppliers or other

business partners. 29 articles included deals. Permits -code is used to refer to the OL3 project applying for and receiving permits for the construction and operation of the power plant. These events include more specific issues than just the broader Advancements. Different stakeholders are also present, such as government officials. 21 articles were coded to include discussion about permits.

Both Deals and Permits follow a very similar trend. Both codes had a lot of references between 2003 and 2006, and then almost none until 2013. After that the references increased slightly, spiking again in 2018. When examining this trend of Deals and Permits and comparing it to the trend of Delays, we can see that during the times of least Deals and Permits, there are the most Delays.

Based on the found events, the timeline of the project is formed, shown in Figure 6. It includes the most important and referenced to Internal Events. As the timeline represents the progress of the project itself, all External Events found are left out of this timeline.

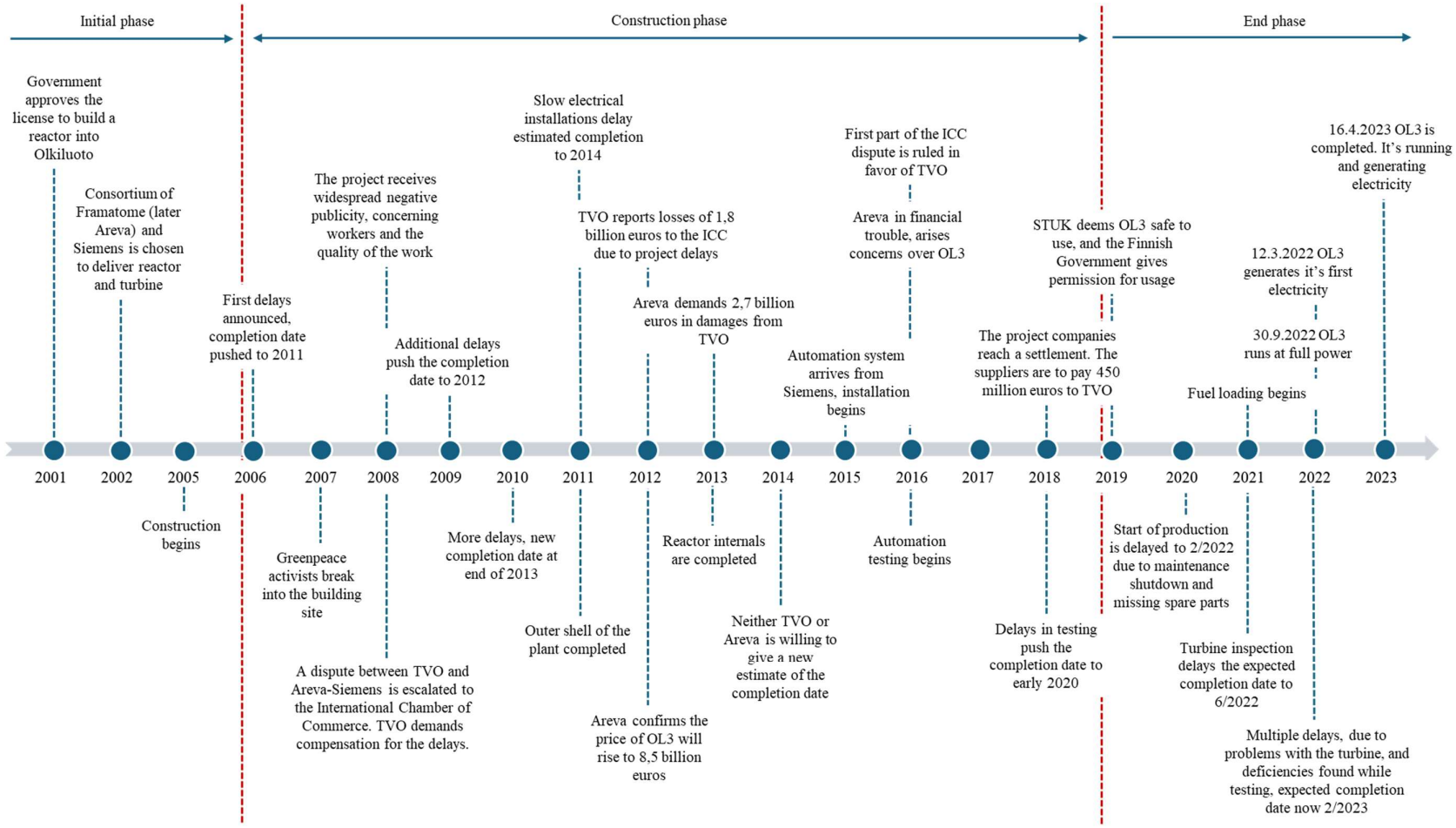

Figure 6 Timeline of the project Olkiluoto

The timeline shows the most notable of these advancements from permits to fuel loading to the reactor running at full capacity. As contrast, the multiple delays are also presented. Even though as previously mentioned, the frequency of articles coded to events changes over time, still the project timeline doesn't have gaps. It is important to realize that how many times events are present in the articles are not necessarily tied to how many events are happening. It is evident when you compare the number of articles coded in Figure 5 to the events presented in the timeline in Figure 6. There is a dip in articles coded to events after the year 2007, but the project timeline is still busy.

From this timeline the division into the three timeframes for analysis is made. The three phases, which are marked with red lines in Figure 6, are the initial phase, construction phase and end phase. We can see that the construction begins in 2005, and the first delays are announced in 2006. Based on this, the first division is set at the end of 2005. You could argue that the initial state should be set before the project construction begins. This would introduce challenges in a study that relies on secondary articles. If the cutoff date were to be set too early, the publications would maybe not have enough time to report on all the stakeholders that are relevant at the very beginning of the project. From 2006, the middle phase, the construction phase begins and lasts until 2019. The project has multiple advances and delays after the initial phase, and the actual construction of the project lasts until the very end. 2019 is set as the division point due to the huge advancement made that year. Olkiluoto 3 gained its final operating permit, and most of the construction was finished by then. After 2019, there were more delays, but originally at the time the project was thought to be at the final stretch. This is therefore a good point to start the end phase. The end phase lasts until the turnkey contractor formally hands over the finished project to the client. And as previously mentioned, the actual cutoff for the articles is set just a bit after that, so we get the most articles about the completion of the project. The end phase therefore runs from 2019 to June 2023.

External events were far less frequently coded than the above-mentioned Internal events. external events were events that showed up in the analyzed articles, that weren't produced by the project and that were not aimed at influencing the project. In total, 31 articles were coded to include external events.

Most external events -coded articles are from the last few years. Part of this is explained by the last articles including a lot of timeline articles that reference external events throughout the project lifetime. Other times when external events -code is found are at the very beginning of the project, and in 2011. From these findings we can find external events that were most mentioned together with the Olkiluoto 3 project.

The earliest external event, that accounts for the first external events coded articles, and also has some references later in articles with timelines, is the 1986 Chernobyl Nuclear Power Plant disaster. The event obviously occurred outside the actual project timeline but is still referenced in the articles. At the beginning phases of the project

Olkiluoto 3, before the construction or even the final decisions of whether the project will be built, this disaster is referenced. It played a role in the process of the government making the decision of building new nuclear power.

The next external event that explains the frequency of the coded articles around 2011 is the Fukushima Daiichi nuclear power plant accident, that occurred in March 2011. Many articles at the time referred to this disaster and compared the Fukushima power plant to the Olkiluoto 3, speculating on its safety. As with the Chernobyl disaster, this event also gained some mentions in the later articles around 2020 – 2023 when the publications looked back at the timeline of Olkiluoto 3.

Looking back at these events does not alone explain the frequency of the external events code in 2020 – 2023. Two more events are responsible. First, the global COVID-19 pandemic was mentioned. COVID-19 was mentioned in 2020 articles but lost its relevance quite quickly and disappeared from the articles.

The rest of the external events -coded articles include a variety of smaller events that were mentioned only once or twice. These include events that were caused or that affected the turnkey contractor and its business partners, or some other actors in the energy sector. Examples include restructuring of the French nuclear sector companies. Although this event includes changes in Areva, the turnkey contractor, they were still coded as External events, as there was no intended direct impact on the Olkiluoto 3 project.

Another example are the events related to other megaprojects, such as the Chinese Taishan nuclear reactors, the Flamanville nuclear power plant in France, and the Watts Bar nuclear power plant in Tennessee, United States. These projects and how they relate to the project are examined further as stakeholders in the next chapter.

A series of events including themes of energy security were also coded, especially influencing the end phase. These arise from the geopolitical landscape in Europe, and issues with Russia. Articles mentioned how much Finland is dependent on Russian energy, and how Olkiluoto 3 could influence this dependency, and energy security. These events culminated in articles mentioning an “energy crisis” in Finland.

5.3 Stakeholders and their role in the case

In this chapter the found stakeholders are presented. First the initial stakeholders are presented. Then some new stakeholders are presented that appear later in the project timeline. In the third subchapter a synthesis of stakeholders throughout the timeline will be presented. The chapter will present how many articles were coded to match each stakeholder category. The chapter presents how many times a stakeholder code is used first in the initial articles, and then in the newer articles. When coding the articles, the whole article was coded to the article. This means that if an article had for example two

different supplier stakeholders, the article would still only be coded once. So, the results shown in this chapter are numbers of articles coded, not number of stakeholders found.

5.3.1 Initial stakeholders

The division into the initial stakeholders is tricky to make, as one has to set a time frame for what exactly are the initial stakeholders. If they are the ones who were there when the project "started", how do you decide when it started? Are they the ones who were there from the very beginning, as in when the first plans for the project were made?

I chose to consider Initial stakeholders as those who appear in the articles before the year 2006. This choice, as explained in the earlier chapter, is due to the actual construction of the project starting in 2005. The cutoff was set to the end of the year 2005 for simplicity. Also, if you set the cutoff date at the date of the start of construction, it is reasonable to assume that not many articles could've been written so quickly, and many initial stakeholders would've been left out. This set of articles, referred to as "initial articles" in the following analysis, includes 37 total articles. 9 articles from Yle, 12 articles from Kauppalehti and 16 articles from Helsingin Sanomat. There is one article from the year 2000, three articles from 2002, 8 from 2003, 13 from 2004 and 12 articles from 2005. There were no articles found from 2001.

All the initial articles were coded to at least one stakeholder code. The 37 articles were coded to stakeholder codes a total of 157 times. This shows that a good number of stakeholders were already present in the very beginning stages of the project. As the first years, 2000 and 2002, only had a couple of articles, the fewest stakeholders were found, with 5 and 17 stakeholders coded in those years. From there on as the number of coded articles increased, so did the number of discovered stakeholders. 46 stakeholder codes in 2003, 47 in 2004 and 43 in 2005. Interestingly however, 2003 only has 8 articles coded, about 50 % less than 2004 and 2005, yet has about the same number of stakeholders coded.

The very first discovered stakeholders were Internal stakeholders. In Table 5 the number of each internal stakeholder code coded in the initial articles is presented. In the initial articles, Internal stakeholders were coded 90 times. And again, 2003 – 2005, where most of the initial articles are from, were coded way more per year. 2003 has the most internal stakeholders with 32 coded. This bump is what causes the abnormal number of stakeholders coded in 2003 that was mentioned above. Out of the initial Internal stakeholders coded, 35 were stakeholders from the demand side, and 55 from the supply side. The demand -side starts as the more coded one, but in 2003 and onwards supply -side stakeholders are coded more.

Table 5 Initial internal stakeholders

	2000	2002	2003	2004	2005	Total
INTERNAL STAKEHOLDERS	**2**	**7**	**32**	**24**	**25**	**90**
Demand side	***2***	***5***	***12***	***8***	***8***	***35***
Client	1	3	6	5	5	20
Client employees	0	0	0	0	0	0
Managers	0	1	1	1	1	4
Shareholder	1	1	5	2	2	11
Supply side	***0***	***2***	***20***	***16***	***17***	***55***
Employees	0	0	6	4	3	13
Subcontractor	0	1	5	6	5	17
Supplier	0	1	3	1	4	9
Turnkey contractor	0	0	6	5	5	16

The demand side of internal stakeholders is mentioned in the very first article of 2000. The article names the project client Teollisuuden Voima, which will further be referred to as TVO. TVO is a Finnish power company, that operates the Olkiluoto Nuclear Power Plant. The company is owned by power companies, industrial companies, and Finnish municipalities. It operates on the cost price principle, meaning that it produces electricity to its shareholders at cost price. (TVO 2025)

The shareholders of the company are also mentioned in the articles. These shareholders at the same time are the customers of TVO, to whom its power plants generate power. When this became evident, that all the same entities would be coded twice as shareholders and then customers, code for client customers was removed and not used.

Two of these shareholders are named, in the very first article: the metal-sector companies Outokumpu and Rautaruukki. Others include the largest Finnish companies in the forestry business, but they are not specifically named. In 2003, the city of Helsinki becomes a shareholder of the Olkiluoto 3 project. It invests in the project in order to be able to reserve a part of the new power plants production for the city's consumption. In 2004, more shareholders are named. Pohjolan Voima, a company owned by Finnish industrial companies is named as the largest single owner of TVO. It is through Pohjolan Voima that the industry companies are the shareholders of TVO and the Olkiluoto 3 project. Small energy companies are also mentioned as shareholders of the project, with a Kauppalehti article having the following quote from the CEO of Pohjolan Voima, Timo Rajala: "TVO's project is a great opportunity for many small electricity companies to survive and receive the benefits of a large-scale company."

The management of TVO and the project is also mentioned, first coded in 2002 and then three more times in later initial articles, one per year. Mentioned managers are CTO Ami Rastas, Chairman of the TVO board of directors Timo Rajala, Manager of the OL3 project Martin Landtman and construction manager of the project Timo Kallio.

The client employees -code is not used in any initial articles. Only mentions of employees are the managers named in articles, but they were not coded again with the employees -code. The client employees -code has not been removed yet even though it wasn't used, as it is reserved for if an article mentions TVO employees and personnel in general in the later articles.

On the supply side of the project, no stakeholders are coded in the first article. The year 2002 only two instances of supply side stakeholders appear. From 2003 to 2005 however, supply side stakeholders are coded in much larger numbers than the demand side stakeholders.

First mentioned are the plausible suppliers and subcontractors of the project. The first articles mention, that about 60 % of the required suppliers and subcontractors are estimated to be Finnish. No specific companies are named yet. In 2004, two large deals are made with Finnish subcontractors, Forssan Betonituote and FINNprima. Later the Finnish company Peikko Group is named as a supplier, supplying steel parts for the project, ordered by for example the turnkey contractor. Subcontractors are tied with Turnkey contractors as the most coded supply side stakeholder, with 16 coding references each. In a 2004 Kauppalehti article, more suppliers are named. The suppliers are from all over the world, and the theme of the article is that some of the required parts and technologies simply don't exist in Finland, so they must be ordered from abroad. Siemens had ordered parts for the turbine from Germany, the United States, the United Kingdom and Sweden.

The turnkey contractor is first mentioned in 2003. Olkiluoto 3 is delivered as a turnkey project, with the French German consortium of Framatome ANP and Siemens AG as the turnkey contractor. They were chosen by TVO through a bidding process. The turnkey contractor is first mentioned in 2003 and confirmed later that same year. The French Framatome will deliver the reactor, and the German Siemens will deliver the turbine. The turnkey contractor then sets up its own bidding process for choosing the subcontractors and suppliers. Since TVO is still responsible for the excavation of the construction site, and Finnish companies are thought to have a strong footing in the bidding process, the domestic percentage of the project workforce is thought to remain high.

The structure of the Turnkey contractor at the beginning is rather cryptic, as the Finnish articles originally talk about a consortium of Framatome and Siemens. The later initial articles shed more light on this consortium. Framatome ANP is a French nuclear reactor company. It was born from the fusion of Framatome and Siemens, when Siemens sold its reactor business to Framatome in 2001. At the time, French government owned company

Areva owned 66 percent of Framatome ANP, and Siemens owned 34 percent. At the beginning of the Olkiluoto 3 project, Framatome ANP was the turnkey contractor from whom Olkiluoto 3 was ordered, of which Siemens owned a part, and Siemens also was to deliver the turbine for OL3.

The employees of the project are coded 13 times from 2003 – 2005. The employees -code on the supply side refers to the employees of all the other supply side stakeholders. This means the employees of Framatome ANP, the subcontractors and suppliers. Many early articles mention the number of employees the project will employ. One of the first numbers is from 2003 Yle article, that mentions the project will require 30000 man-years of domestic labor. The direct effect is estimated in a later article to be 11000 to 13500 man-years. Later in 2004, a Kauppalehti article is more sceptic about the percentage of domestic labor. The article includes a quote from Framatome ANP CEO, who says they are aiming for 40 % of the work being Finnish but cannot guarantee it.

The External stakeholder -side includes a larger variety of codes, but as mentioned, in the initial articles they were used less than the internal stakeholder codes. The number of external stakeholders coded in the initial articles is presented in Table 6.

Table 6 Initial external stakeholders

	2000	2002	2003	2004	2005	Total
External stakeholders	**2**	**10**	**14**	**23**	**18**	**67**
Private	***1***	***7***	***9***	***16***	***13***	***46***
Competition	0	2	1	0	2	5
Energy Consumers	0	1	3	4	0	8
Energy Sector	0	0	2	2	1	5
Fossil	0	0	0	2	0	2
Nuclear	0	1	0	1	3	5
Renewable	0	0	0	0	0	0
Environment	1	1	1	2	1	6
Locals	0	2	2	5	2	11
NGOs	0	0	0	0	4	4
Public	***1***	***3***	***5***	***5***	***5***	***19***
International Government	0	0	1	2	2	5
Local Government	1	3	4	3	1	12
Governance	0	0	0	0	2	2

The same rise in articles coded can be observed in Table 6 as with Internal stakeholders in Table 5, although the increase is not as dramatic. All codes are used, except the code

for the Renewable energy sector. The most coded were Local Government, and Locals. Local Government -code was present each year, whereas some External stakeholders such as NGOs were only coded in the later articles.

19 of the external stakeholder references were public stakeholders. Public stakeholders had an even more steady representation across the initial years. Local government -code is coded to articles that mention governments and government bodies inside Finland. Single politicians are also included. The first stakeholder found with this code is the Finnish Government, more specifically the Finnish Parliament. They are a stakeholder of the project from the very beginning, as they are the ones who gave a permit for the project to be built. In the first article from 2000, Teollisuuden Voima is applying for this permit from the Finnish Ministry of Trade and Industry. The article also specifically mentions the Green Party. Article says that "The Green are ready to whatever it takes to deny the permit." The party leader is "ready to recommend, that the Green Party leaves the Government, if the Parliament approves the new plant." In an article from 2002 that has a timeline until that year, the Parliament is mentioned to have already voted on a fifth nuclear power plant in 1993, deciding to block the permit with votes 107-90.

Under the Local Government code, the code for Governance is also specified. As mentioned already in the methodology, this is due to one stakeholder under Local Government gaining a significant amount of attention in the first round of articles coded. This stakeholder is Säiteilyturvakeskus, or STUK as referred to later in this thesis and in many of the articles. STUK is the Radiation and Nuclear Safety Authority of Finland. Its first appearance in the articles is from 2005, where it is mentioned in two articles. First mention is in HS article from 18.2.2005, where the Finnish parliament has approved the permit for OL3. The article mentions that the Government mainly relied on STUK on its decision to approve the power plant. STUK gave a statement that there are no security concerns that prevent the permit.

The final code falling under public external stakeholders is International Government. This refers to the same kind of stakeholders as Local Government, but outside Finland. This includes any government bodies or politicians outside of Finland. The first article with this code is from 2003, with two more articles both in 2004 and 2005. The first stakeholder discovered is the French government. The French government in 2003 was having discussions about developing their nuclear power plants, and the Finnish Olkiluoto 3 project could prove to be important in steering that debate. The next international government -coded stakeholder is discovered in 2004, when the EU Commission is mentioned. They gave a statement approving the construction of Olkiluoto 3. They were optimistic about the project improving energy source diversity in Europe. TVO had an obligation to report about the Olkiluoto 3 project to the European Commission due to the Euratom -agreement stating all large nuclear investments must be reported. In 2005, OL3 also gained approval from the Swedish nuclear safety officials. The British were also

especially interested in Olkiluoto 3. The British parliament environmental committee met with the Finnish ministry of trade and industry.

The group of stakeholders with the most individual codes, the Private external stakeholders, were coded to 46 articles. The group also includes some codes that had to be tailored to fit this case after the first coding run. The first code, competition, originally referred to other competing energy providers. However, in the coding process this was expanded to include also other competing projects. Many projects that weren't necessarily directly "competing" were still coded to this code. This includes any other megaprojects that the OL3 project is compared against. The first occurrences in the article are from before the final decision on OL3, when TVO and Fortum were competing about which company builds the new reactor unit. The locations in Loviisa and Olkiluoto were also competing on which power plant gets the new reactor project.

When other energy providers and the overall energy industry are mentioned, the article is coded to Energy sector, or if a specific form of energy is mentioned, it is coded to the corresponding code, either Nuclear, Fossil, or Renewable. When the above-mentioned competition code was used, often the Energy sector code was used as well. For example, when in a 2002 article the Loviisa- and Olkiluoto 2 power plants were mentioned, the article was coded to Competition, and Nuclear. Other nuclear sector stakeholders include the French nuclear industry, and the nuclear construction projects that are ongoing in Asia, most in China. The Nuclear and Fossil energy sectors both appear as stakeholders in the initial articles. The articles mentioned how Olkiluoto 3 is a big deal for the whole European energy sector, as it is the first nuclear project initiated since the Chernobyl disaster. Olkiluoto 3 is also mentioned as a good answer to replace fossil energy sources. The renewable energy sector is not mentioned in any of the initial articles and is not an initial stakeholder. Environmental issues, however, were present from the very beginning, as the environment stakeholder code was used for articles from each year.

The locals are mentioned as stakeholders the most out of any single private stakeholder. At the beginning, the mentions in articles were about the locals in Eurajoki and the benefits the new power plant project would bring them. The later initial articles talk about the possible rise in employment and the locals getting new jobs, as well as the local municipality gaining a boost from the project.

Earlier when examining internal stakeholders, the customers were mentioned. The customers refer to those that the Olkiluoto 3 plant provides its electricity. The Energy consumers code in external stakeholders is used for the very end consumers of this electricity, so usually the end customers of the internal customers. In a 2003 article the TVO executives mention that 60 % of the electricity produced goes to the industrial companies and the rest to the public. The importance of Olkiluoto 3 to the energy consumer stakeholders is outlined in the articles with mentions of the increasing energy demand.

The final private external stakeholders are non-governmental organizations, who appear first as stakeholders in 2005. NGOs are first named in 2005 when the Finnish government approves the Olkiluoto 3 project. In the same article it is mentioned that the government got 40 statements from different non-governmental organizations and individuals. None of these NGOs are named. Two important NGOs, however, are mentioned by name in articles about disputes over the taxation of the project employees. The first is Confederation of Finnish Industries, EK. The EK representative in the article is concerned, because the Finnish government has outlined that employees working on the Olkiluoto 3 site do not qualify as temporary work, so they cannot get tax benefits. Another NGO, the union of metal workers agrees that this will likely make the subcontractors turn to foreign labor instead if the Finnish labor becomes too expensive.

5.3.2 Construction phase stakeholders

After the initial stakeholders are found, the newer articles are examined to see how the frequency of the stakeholder codes continues to develop, and whether some entirely new stakeholders are found. This phase spans more years and therefore has significantly more articles analyzed. This is why it is appropriate to compare the average coded articles per year, when comparing code frequencies between phases.

The construction phase had a total of 164 articles coded with a stakeholder code. In these articles, stakeholder codes were used a total of 556 times. Out of these 311 were internal stakeholders and the rest 245 were external stakeholders. The division is consistent with the initial articles, with more internal than external stakeholders. The difference is slightly less drastic with 27 % more internal stakeholders in the construction phase articles, whereas this number was 34 % in the initial phase articles. Table 7 shows the internal stakeholders coded in the construction phase articles.

Table 7 Construction phase internal stakeholders

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Internal stakeholders	**36**	**20**	**15**	**24**	**29**	**18**	**29**	**30**	**21**	**17**	**25**	**30**	**17**	**311**
Demand side	***14***	***9***	***8***	***11***	***9***	***5***	***14***	***14***	***11***	***10***	***10***	***17***	***12***	***144***
Client	9	7	5	7	5	3	8	8	7	5	7	10	9	90
Client employees	0	0	0	0	0	0	0	0	1	2	0	2	0	5
Managers	5	2	3	4	4	1	6	2	2	2	2	4	3	40
Shareholder	0	0	0	0	0	1	0	4	1	1	1	1	0	9
Supply side	***22***	***11***	***7***	***13***	***20***	***13***	***15***	***16***	***10***	***7***	***15***	***13***	***5***	***167***
Employees	5	2	1	3	7	6	3	4	2	0	2	1	0	36
Subcontractor	5	4	1	1	7	4	2	4	1	0	1	0	0	30
Supplier	3	0	0	0	2	0	0	1	0	1	1	1	0	9
Turnkey contractor	9	5	5	9	4	3	10	7	7	6	11	11	5	92

Some trends from the initial articles continue to the construction phase articles. As seen in Table 7, the division between demand and supply side stakeholders remains similar, with a few more supply side stakeholders coded. Inside these groups, however there are more clear differences. Mentions of TVO and the Turnkey contractor dominate the numbers nearly each year, with 90 and 92 coded articles total respectively. In the initial articles, the client was coded more, but now in the construction phase the turnkey contractor has gained more coding references, inching ahead of the client.

The turnkey contractor, formerly Framatome ANP, changed its name at the very beginning of the construction phase in 2006 to Areva NP. Siemens voices concerns of not being heard on the project and wishes to acquire a larger share of the joint venture. This fails, and as a result, in 2009, Siemens decided to sell its part ownership in Areva NP, leaving the whole company to the French Areva group. This doesn't mean that Siemens exit the OL3 project, as the contract remained, and Siemens remained the supplier of the turbine. Areva NP also saw changes later in 2016, when the Areva group was divided. Areva already announced the need for restructuring in 2015, following its financial troubles. The OL3 project and its delays accounted for some of these troubles leading to insolvency. The articles from the time are sceptic, and speculate on what happens to OL3, if Areva sells its nuclear reactor business. This then happened in 2016 when Areva sold its reactor business to EDF, another French state-owned power company. Olkiluoto 3 was not abandoned and a new holding company, Areva S.A., was created to continue the project.

Client employees remain rare, only being coded to 5 articles over these 13 years. Managers were coded over thrice as often as in the beginning. Articles didn't mention any management actions, or have opinions or events relating to them, the frequency of the code is explained by the managers giving statements in many of the articles. A lot of the time, the articles also have quotes from TVO executives like press releases and other public statements. On the demand side, one stakeholder did significantly drop while others rose, and that is shareholders. They were coded on average to 0,69 articles per year during the construction phase, while in the initial phase this number was 2,2 articles per year.

On the supply side codes, employees and subcontractors are still coded about as frequently as in the initial articles. As mentioned above, turnkey contractor was coded way more, over twice as often. Suppliers are coded much less often. The suppliers seem to have been selected and mentioned in the initial phase and haven't received much attention since.

Breakdown of external stakeholders coded in the construction phase articles can be seen below in Table 8. Private stakeholders are coded on average just as much per year, but the public side sees a change with more articles coded in the construction phase.

Table 8 Construction phase external stakeholders

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
External stakeholders	**11**	**19**	**26**	**23**	**16**	**19**	**10**	**13**	**26**	**20**	**22**	**22**	**14**	**241**
Private	***6***	***14***	***17***	***11***	***10***	***12***	***5***	***8***	***15***	***11***	***12***	***14***	***7***	***142***
Competition	1	1	1	3	0	1	1	1	3	1	2	4	2	21
Energy Consumers	0	1	0	0	2	1	0	2	3	0	1	2	1	13
Energy Sector	0	1	2	0	0	0	0	0	2	1	0	1	1	8
Fossil	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	1	2	1	5	0	2	2	3	3	6	5	5	2	37
Renewable	0	1	2	0	0	0	0	0	0	0	0	0	0	3
Environment	2	3	6	1	1	1	0	0	1	1	0	1	0	17
Locals	1	0	0	0	1	0	0	1	1	0	2	0	1	7
NGOs	1	5	5	2	6	7	2	1	2	2	2	1	0	36
Public	***5***	***6***	***9***	***12***	***6***	***7***	***5***	***5***	***12***	***9***	***10***	***9***	***8***	***103***
Energy Security	0	1	0	0	0	0	0	0	1	0	0	1	1	4
International Government	1	3	4	4	0	0	3	0	4	6	6	5	3	39
Local Government	2	2	1	2	1	2	0	2	3	1	1	0	1	18
Governance	2	0	4	6	5	5	2	3	4	2	3	3	3	42

The main finding from construction phase external stakeholders is the frequency of the code “governance”. It is consistently present in the articles each year. The stakeholder responsible is STUK. It is present in multiple articles that deal with safety, permits, and some found deficits of the plant.

The Finnish government and other local government are not mentioned as many times, but international government is coded to many articles, especially in 2014 – 2017. A new stakeholder is discovered, the International Chamber of Commerce, more specifically its International Court of Arbitration. TVO and Areva sued each other over the delays over the project, blaming each other for it. These disputes were settled in 2018, in favor of TVO. The French government was also mentioned frequently and coded international government. This is due to the OL3 project relating to their nuclear energy policies, and the restructuring of their energy sector mentioned earlier.

On the private side, the main outlier is NGOs, tripling in articles coded per year. Alongside unions and other NGOs relating to employees, environmental agencies enter as stakeholders. Greenpeace especially gains mentions as they organize protests and voice their opinion in the media. Many articles with NGO code therefore also had the environment code.

The “normal civilians” outside the project seemed to gain less mentions in the construction phase. Both locals and energy consumers were coded less than in the initial articles. The energy sector was also coded a little less, with fossils being coded zero times, renewable just three times and nuclear 37 times. This together with the bump in competition code suggests that the project was compared more to other nuclear projects. Two new stakeholders are discovered belonging to the competing nuclear projects: the Chinese Taishan plant, and the French Flamanville plant. Both use the same EPR technology as Olkiluoto 3, and this is why OL3 is being used as an example for the other two projects that were started later.

5.3.3 End phase stakeholders

The project end phase begins 2019 from the STUK permit for Olkiluoto 3 operation, when most of the construction was finished. A total of 82 articles were coded to at least one stakeholder, and in these articles, a total of 230 stakeholder codes were used. Again, more internal than external stakeholders are coded, at 126 versus 104. This gap is again a bit narrower than in the construction phase, which was narrower than in the initial phase. As in previous chapters, next both internal and external stakeholders are broken down by code. Below in Table 9 the internal stakeholder codes are presented. Exactly twice as many demand side codes are used as supply side codes. This is a definite deviation from

the earlier two phases, which both had more supply- than demand side stakeholders coded.

Table 9 End phase internal stakeholders

	2019	2020	2021	2022	2023	Total
Internal stakeholders	**16**	**27**	**24**	**21**	**38**	**126**
Demand side	***10***	***15***	***16***	***18***	***25***	***84***
Client	8	10	11	9	16	54
Client employees	0	0	1	0	3	4
Managers	2	3	4	5	5	19
Shareholder	0	2	0	4	1	7
Supply side	***6***	***12***	***8***	***3***	***13***	***42***
Employees	0	3	0	1	4	8
Subcontractor	0	0	0	0	2	2
Supplier	0	1	2	1	1	5
Turnkey contractor	6	8	6	1	6	27

The demand side stakeholders' increase in articles coded are mostly due to the increase in times the client is coded. Other stakeholder codes remain on the same level from the construction phase, with shareholders gaining a couple more mentions, still less than in the initial phase articles.

Most supply side codes drop in average articles coded per year from construction phase and fall below the initial phase as well. Suppliers are the only code increasing from the construction phase, but only slightly, still falling short of the initial phase frequency. Turnkey contractor is the only one coded more than in the initial phase. The numbers make sense intuitively. The end phase, as mentioned, is supposed to be after most of the construction is finished, and therefore the subcontractors and the employees are not as relevant stakeholders.

The division of external stakeholders into private and public is still similar, with more private stakeholders. Private stakeholders outnumber the public stakeholders more than in the construction phase, but not quite as heavily as in the initial phase. The division is presented in Table 10.

Table 10 End phase external stakeholders

	2019	2020	2021	2022	2023	Total
External stakeholders	**20**	**14**	**27**	**32**	**25**	**104**
Private	***11***	***6***	***13***	***19***	***17***	***66***
Competition	2	2	4	5	1	14
Energy Consumers	1	1	8	17	17	44
Energy Sector	0	2	2	7	5	16
Fossil	0	0	0	1	0	1
Nuclear	3	1	5	3	2	14
Renewable	0	0	0	1	2	3
Environment	3	1	4	0	5	13
Locals	0	1	2	2	3	8
NGO	2	2	1	4	7	16
Public	***8***	***7***	***11***	***7***	***5***	***38***
International Government	1	4	1	3	2	11
Local Government	1	0	2	3	1	7
Governance	6	3	8	1	2	20

Private stakeholders like energy consumers, the energy sector and competition saw a significant increase in articles coded. This relates back to the external events of an energy crisis and energy security issues mentioned in the end phase articles. Olkiluoto 3 therefore became more and more important for Finland, energy sector. Locals were present in articles that interviewed them now that the project is about to be finished.

On the public side, it's more business as usual, with a slight increase in governance coded articles, and a slight drop in international government mentions. Governance is relevant as Olkiluoto 3 gains its final set of permits. International government is not as relevant anymore with the disputes and Areva issues settled.

5.3.4 Overview of the stakeholder development in the case

This chapter will summarize the findings from chapter 5.3. From the findings of the previous sub-chapters, a comprehensive set of stakeholders can be constructed. The initial and new stakeholders found can be compared and put into the categories outlined in the theoretical framework. We can also look at the most apparent trends found in how the stakeholder codes appear over the years.

In Table 11, the internal and external stakeholders discovered are presented in a table derived from the work of Winch (2004, 323). Most of the important stakeholders that will be present throughout the project are already identified. Some of these get more mentions than others, for example STUK is discovered only in one article from the very end of the initial phase and is only mentioned quickly in relation to the Finnish government.

Table 11 Initial discovered project stakeholders

Internal stakeholders		***External stakeholders***	
Demand side	*Supply side*	*Private*	*Public*
TVO	Framatome Siemens	Local residents	Finnish government Green party
Finnish industrial companies	Finnish contractors French contractors	Finnish workforce	European Union
Finnish power companies	International suppliers	Environmentalists	French Government
TVO Managers	Project employees		Eurajoki Loviisa Helsinki

The initial phase articles are filled with discussions about the application for the new power plant, where to build it, and who gets to build it. The overall most important stakeholders of the initial phase are the client itself, its owners, the turnkey contractor, subcontractors and suppliers, and the government.

Moving onto the construction phase, the trend in discussed stakeholders shifts. As the construction moves forwards the focus is on the turnkey contractor and employees, rather than the client and its shareholders. The employees discussed in the initial articles were local Finnish employees, with speculation on how big piece of the contracts they would get. Now the focus has shifted clearly onto foreign labor. The locals that were heard in the initial articles are also missing, replaced with NGOs voicing their concerns. The delays also become part of the main storyline of the media, and the relationship between the client and the turnkey contractor is present in a lot of the articles. The international government therefore is also much more present than in the initial phase.

Whereas the TVO shareholders financing the project aren't mentioned anymore, other financial stakeholders are, for example how the EU supports nuclear power via its financial instruments, and how the French taxpayers are funding the Areva project, meaning the OL3 delays cost French taxpayers money.

Some new stakeholders are also discovered. The first NGO, and the most coded one, is Greenpeace. Greenpeace appears in the articles voicing their opinion against OL3. They also organized protests at Olkiluoto, that were reported in the articles. Other environmental NGOs briefly appear in the construction phase articles, as well as green political parties across Europe. Unions and other NGOs related to the workers are also

present, as the articles voice issues with foreign labor and its treatment. One Bulgarian contractor exits the project due to unpaid salaries and possible mafia connections. Multiple Polish contractors exit as the project gets delayed.

Other interesting new stakeholders are the comparable megaprojects. The Flamanville reactor that was planned in the initial phase begins construction with OL3 as its example. China also builds EPR reactors into Taishan. Construction began in 2009 and finished in 2018. OL3 is also compared to Watts Bar in the USA, and non-power plant related projects such as the Finnish Länsimetro. Talks about an application for a new powerplant arise, with Olkiluoto 4 in the talks being compared to OL3. TVO ultimately decides to withdraw the application in 2015, partly due to OL3 problems.

Existing stakeholders also see changes. The turnkey contractor is restructured. Siemens exits as a shareholder but remains a supplier. Areva, and the whole French nuclear business is restructured. Existing stakeholder STUK, that was briefly mentioned in the initial phase, becomes a major stakeholder in the construction phase, overseeing the progress and intervening when necessary.

The end phase of the project, as mentioned earlier, sees a shift in discussed stakeholders and issues, however, there are few new stakeholders discovered. TVO and its customers, as well as the end customers and the general energy markets are in focus. Suppliers and contractors get few mentions. Only important new stakeholder is the mention of Fingrid, the Finnish electricity grid operator. It usually represents energy consumers in the article, with themes of energy shortage and energy security. Below in Table 12 all the parties are presented, that are or were at some point important project stakeholders. Smaller individual stakeholders are grouped, such as the multiple different subcontractors. The table gives a good summary of the stakeholder field of project Olkiluoto 3. It shows how the demand side stakeholders have been quite stable, and more development has happened on the external, particularly private, side of stakeholders.

Table 12 All discovered project stakeholders at the end phase

Internal stakeholders		***External stakeholders***	
Demand side	*Supply side*	*Private*	*Public*
TVO	Areva (Framatome)	Local residents	Finnish government
Pohjolan voima	Siemens	Energy consumers	STUK
Finnish industrial companies	other international suppliers	Greenpeace	European Union
Finnish power companies	Finnish subcontractors	other environmentalists & activists	Eurajoki Loviisa Helsinki
TVO managers	international subcontractors	Unions	French Government
	project employees	the environment	Green Parties
		nuclear projects	
		other megaprojects	
		energy industry	

5.4 Stakeholder salience

This chapter includes findings from the article that relate to stakeholder salience. Once the stakeholders themselves have now been discovered and categorized, they can be analyzed for how they appear to possess the three attributes of power, legitimacy and urgency. Rather than go through all the stakeholders in all the three phases of the project, this chapter presents the initial stakeholders and the later important stakeholders and what attributes of salience they possess. Then, findings of these attributes changing throughout the project are presented. The earlier finding of stakeholders based on the codes was straightforward, as when the stakeholder was mentioned, it was coded. Salience is not as straightforward to spot from the articles. During the coding process, notes were made of whether an article seemed to include a stakeholder showing one of the attributes of salience. Those articles were then read thoroughly, and the findings are presented here.

5.4.1 Initial stakeholder salience

The stakeholder salience model presented in the theoretical framework of the thesis categorizes stakeholders into eight categories based on their perceived power, legitimacy and urgency. These eight categories are then divided into three groups, plus non-stakeholders. The initial discovered project stakeholders that are presented in Table 11 can be divided into salience categories by following the theory by Mitchell, Agle and Wood (1997). As the salience model is dynamic, the presented division is only a snapshot of these stakeholders, and they can move categories at any time, this is just the division that is most apparent from the initial articles. This snapshot of initial stakeholders can be seen in Figure 7. In addition to being dynamic, the stakeholder salience model is based on *perceived* salience. Therefore, this figure is not only subject to change over time but also based on the articles analyzed in this thesis and could look different if a different data set was analyzed.

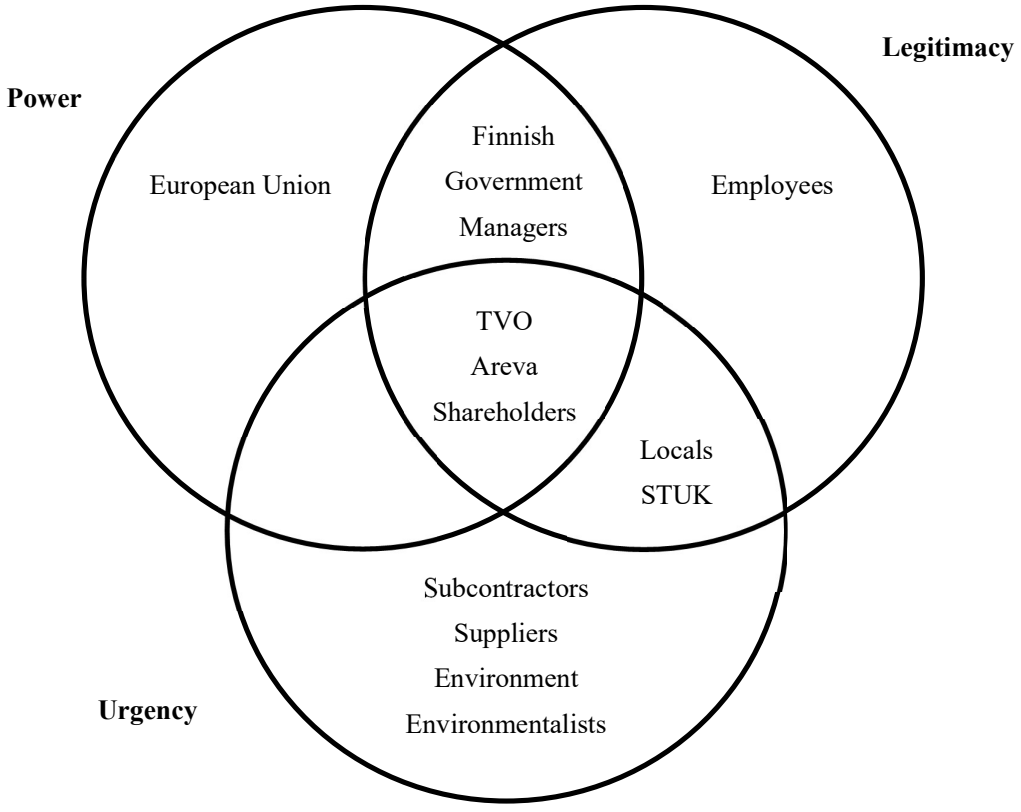

Figure 7 Initial stakeholder salience

Definitive stakeholders are those at the center of the project, who possess all three attributes. The project client TVO is a definitive stakeholder, arguably the most important one. Throughout the project they exhibit urgency, legitimacy and power. The same could

be said for the Turnkey contractor Framatome and Siemens, later Areva. In the early articles, however, they do not exhibit as much urgency as TVO. This is just one project for them, whereas for TVO it is the most important one. The turnkey contractor therefore could be considered a dominant stakeholder instead. TVO and its shareholders in the very first articles seem to also lack power. Before they can build the project, they need a permit from the government. This gives them power and lifts them to definitive stakeholder status.

The Finnish government, based on the early articles, mostly acts as a dominant stakeholder. They possess power and have legitimate claims on the project, as in the beginning they decide that Finland needs the new power plant project. Then at the time of the decision and voting on permits, they move closer to a definitive stakeholder. Another dominant stakeholder is the managers. They possess power and legitimacy, but in the initial articles show no signs of urgency and are not present in most articles.

Other expectant stakeholders with two attributes are the dependent stakeholders, locals and STUK. Locals, referring here both to the individuals and the municipalities of Eurajoki and Loviisa, have urgent legitimate claims at the beginning of the project. They are dependent on the project, wanting it to be built in their locale, but have no power to influence that decision. STUK also has urgent legitimate claims. Being the safety authority, they evaluate the propositions of TVO and the different plans for Olkiluoto 3. However, in the initial articles the impression is that STUK themselves don't have direct power over the case project.

Most common latent stakeholders, possessing only one attribute of salience, are the demanding stakeholders. In the beginning of the project there are many of these as the potential subcontractors and suppliers all have urgent claims on the project, wishing to be picked up by the project client and turnkey contractor. They, however, have no power or legitimacy on the project itself, just urgency, as they have a lot of potential gains from the project case. Other demanding stakeholders are the environment and the environmentalist NGOs. The environment is present in the early articles mostly as something the project could influence. The environmentalists are also briefly mentioned as opposing the project, having urgent claims without power or legitimacy.

Final latent stakeholders are the dormant EU and the discretionary employees. Both are groups that show no urgent claims on the project at the beginning, acting mostly as observers. Employees have legitimacy on the project, being a part of it. The European Union bodies have comments on the project but make no actual claims.

5.4.2 Changes in stakeholder salience

Once the initial state of the stakeholders' salience is clear, the changes in their salience throughout the project can be observed. This is arguably more interesting, as it gives a better understanding of the potential each stakeholder possesses to influence the project, and how important the project is to them.

Possessing the three attributes isn't a simple yes/no -question, as the stakeholder can possess the attributes to a varying degree. Therefore, even the definitive stakeholders who already can be seen possessing all three attributes can exhibit changes in salience, for example using their power at certain points of the project. The definitive stakeholders TVO and Areva are a good example. They show varying degrees of power and urgency over the course of the project. TVO especially seems to fall into the dominant stakeholder category, or in some articles it is even suggested that they lack power, which would make them demanding or discretionary. This stems from the project being delivered as a turnkey project, with TVO having less say in the practicalities of the project than Areva. An article in Helsingin Sanomat argues that TVO is "on the passenger seat, with Areva taking the wheel". Over the course of the construction phase, the client and turnkey contractor dispute, whose fault the delays are. Often times, the French blame the Finnish for having too strict governance and the approvals taking too much time. An article in Helsingin Sanomat 25.9.2016 has a great quote that summarizes this:

> *"The French say that this [governance] is why so much time is wasted on the project. And the Finns answer, that you should've done it properly the first time. Both are right in a way."*

This quote is by a family member of an Areva employee working in Finland, who brought their family with them. This highlights how the two cultures clashing in the project can cause issues.

TVO – Areva -relations are complicated further, when the two enter into a legal dispute. Both parties seek power from the until then dormant stakeholder, the International Chamber of Commerce's International Court of Arbitration. The rather poor relationship between TVO and Areva lasts throughout the construction phase, until they reach a settlement in 2018 in favor of TVO.

In addition to TVO and Areva, Shareholders were also mentioned as definitive stakeholders in the initial phase. After the initial phase when the construction begins, the shareholders show less urgency, moving into dominant stakeholder positions. As mentioned, the articles and project manager comments within them move focus away from the shareholders and onto the project subcontractors and employees during the construction phase. Then again at the end phase the shareholders' urgency rises. When

the articles discuss the potential energy crisis and the rising electricity prices, the shareholders, being also the customers, would benefit from the project's swift completion. At the same time the end customers, the energy consumers, show urgent claims on the project. They, however, lack power and legitimacy.

At the initial phase, STUK was mentioned as a dependent stakeholder, as it seemingly had no power of its own, but a clear interest, in the project. As the project moves forward, it could be argued that STUK does show power towards the project. Multiple articles with events such as delays and permits mention STUK as the one either granting permits or causing delays with their demands. Many times, STUK found deficiencies in the construction and demanded them to be fixed before the project can move forward. Even though the Finnish government is the source of STUK power, the issues don't have to be escalated to the government before the project companies acknowledge them, meaning that STUK itself has power over the project.

As mentioned, the employees played a larger role during the construction phase of the project. The employees were a topic in many articles, and they showed urgency in addition to their legitimate claims. Articles from 2010 all the way to 2020 include discussion about employee rights and disputes. Employees gain the missing component of salience and power, from a new stakeholder, NGOs such as unions. The unions are therefore dormant stakeholders that move in salience and show urgency when the employees need them.

Suppliers and subcontractors, who had urgent claims in the beginning, make no such claims once the project starts moving forward and the subcontractors and suppliers are chosen. Together with the locals, they move more towards the discretionary stakeholder group.

The other demanding stakeholders, environment and environmentalists, clearly become more salient during the construction phase. Greenpeace in particular shows urgency and in the form of protests also shows power. It is up to interpretation whether they have legitimate claims as well, making them either dangerous or definitive stakeholders at the times of these protests. Greenpeace acts on behalf of the environment, lobbying for renewables instead of nuclear power. The environment as a stakeholder then in turn gains power from these environmentalists. What makes Greenpeace's legitimacy questionable, is the fact that later they changed their views on nuclear energy. In addition to protests, Greenpeace and other environmentalists also gain power from the European Union. They made a complaint over the project funding to the EU commission, which was investigated. Investigation found nothing illegitimate about the funding.

The final group of new stakeholders that appeared after the initial phase are the other projects that OL3 is compared against. These don't really fit the salience model in a traditional way, but their position against OL3 can be compared through salience. The other EPR projects in Flamanville and Taishan are dependent on OL3, with articles noting

how OL3 sets an example. Similarly, when the other projects move forward, OL3 seems to be somewhat influenced by them as well. When Taishan reactor has some issues, STUK immediately requires OL3 to be inspected for similar issues as well. In this case, the Taishan power plant and its actions have some form of power over OL3. Most of the project lifecycles, the comparable megaprojects are discretionary stakeholders, or non-stakeholders, just observing the progress of OL3, and vice versa, the case project observing the others. In moments, the projects move in salience and influence each other, like OL3 affecting the decision to not seek a permit for another reactor.

6 CONCLUSIONS

This chapter looks at the findings of the previous chapter, and studies what conclusions can be drawn from them when combined with the literature of megaprojects, and the stakeholder theory. The conclusions are presented roughly in the order of the sub-questions. First, the challenges found in the project timeline are presented. Then the stakeholders and how they categorize, and change is examined. Third, the stakeholder salience is compared between the findings and the literature.

6.1 Progression of the project

The first sub-question *"How does a megaproject progress?"*, is largely answered by the timeline in earlier shown Figure 6 and the events it shows. Some interesting links can however be drawn from this timeline into the megaproject literature.

As the findings and the formed timeline show, the project progress was anything but smooth. The project faced multiple delays. Flyvbjerg's (2014, 11) "Iron law of megaprojects" was present, as the project did indeed go over budget, and over time. The project faced many of the challenges that were warned about in the previous megaproject literature. The Olkiluoto 3 project did eventually get completed in 2023, 14 years late, and about 5 billion euros over budget.

The project timeline is quite eventful as well, including both internal and external events. Based on the public image and the overall headlines in the articles, you could assume that delays were the most present internal events. That was not the case, however, as more advancements were coded than delays. This is, however, explained by how these articles are divided into the project timeline. The initial and end phase articles included mostly advancements and permits, as the project moved from planning to construction. Once the construction began, so did the problems, and delays. This relates to the challenges outlined in the megaproject literature. It is typical for megaprojects to start optimistic and not take into account all the possible later issues. Olkiluoto 3, based on the studied articles, seems to follow suit and start smoothly, running into challenges later. Project management was not ready for what complexities the project actually included. (Flyvbjerg 2014, 9.)

In a project that stretched over such a long time, there was plenty of time for multiple external events to occur. These events influenced the project, and the project had importance to some of the events. The COVID-19 pandemic was a relevant external event that influenced the end part of the project. The event could be described as what Taleb (2010, 16) calls a "black swan", a rare and unexpected event with extreme impact. There was surely nothing in the planning phase that could have shown that an event like this

would happen. The pandemic caused delays in construction and some repairs, but they remained rather mild compared to the already existing delays of multiple years. What caused concern was the overall economic impact of COVID-19. During the pandemic many economies faced challenges with companies struggling. Discussion was therefore made on whether the turnkey contractor, which was linked to the French government, would allocate the necessary funds to complete the Olkiluoto 3 project, or whether the money would go to aid the French economy through the pandemic. There were real signs of danger, and this "black swan" -event could have proven more dangerous had the French drawn an even stricter line on their COVID-19 financial policies.

More challenges outlined in the previous megaproject theory by Flyvbjerg (2014) were present in the case project. The capabilities of the turnkey contractor were brought up in an Yle article from 2014. Areva and Siemens were maybe too optimistic about their capabilities to carry out the project. Head editor of the French finance newspaper *Les Echos*, Pascal Pogam describes the situation:

> *"Areva was prepared to do anything to win the Olkiluoto 3 contract, also to belittle its deficiencies in project management. Areva had delivered and installed nuclear reactors before, but it had never carried out projects from the start to the end, as in France the head contractor had always been the EDF-group."*

Many articles included opinions on how the source of the challenges was lackluster planning. Optimism bias mentioned by Flyvbjerg (2014, 9) is present. The following quote from Helsingin Sanomat in 2007 sums up the view many had of why the project is facing delays:

> *"The schedule was unrealistic from the very beginning maybe because the decisions were made by financiers; the finance plans seemed better the faster the project is started. It would be a different story if the plant was just a copy of an old one, but the one made in Olkiluoto is a prototype."*

The quotation above from Helsingin Sanomat highlights another megaproject challenge. The challenge of "uniqueness bias", as described by Flyvbjerg (2014, 9) was present during the project. As the early articles mentioned, the Olkiluoto 3 reactor was the first of its kind. Later articles mentioned delays occurring due to new technologies causing unexpected challenges. The uniqueness was also an important factor in how the project compared to other projects in the future throughout the timeline. In the beginning, based on the articles, Olkiluoto 3 was seen very much as a unique project, with not many comparisons drawn to other projects. Later Olkiluoto 3 started to appear in the articles

not only as a nuclear project, but also as an example of a megaproject, and usually a very cautious tale of a delayed and problematic one. To combat the challenges Flyvbjerg (2014, 9) mentions, the project could have benefited from comparisons to other megaprojects earlier. Although the reactor technology is new, as these results show the project was a typical megaproject with its usual challenges, so comparisons to megaprojects rather than just nuclear projects would have been useful. Indeed Olkiluoto 3 did become an example for other projects that were built later with the same technology. The other projects, especially Taishan in China, also influenced Olkiluoto 3. When a problem was spotted with Taishan, Olkiluoto 3 was immediately inspected in case of similar problems. Comparisons were also drawn as Taishan was completed much faster than Olkiluoto 3, although it too was delayed, just less dramatically.

The largest challenge for the progress of the case project, however, was the complex network of multiple actors. This issue is investigated further in the next chapters, aiming to answer the two remaining sub-questions.

6.2 Stakeholder complexity

6.2.1 The unique stakeholder field of a turnkey project

The usual picture of a company in the center, and the stakeholders around them, doesn't really describe this case well due to the turnkey project aspect. The division, suggested by Winch (2004, 323), into internal and external, and then further division of these groups, gives a better picture of what the project stakeholders look like at different times. Looking back and comparing Table 11 and Table 12 of found stakeholders with Table 1 by Winch (2004, 323), the found stakeholders match the theory quite well.

The case project starts out with the focus on the internal stakeholders. At the core of the stakeholder field are the client, TVO and the turnkey contractor Areva. This arrangement already somewhat complicates the project stakeholder relations. TVO handed out responsibilities of the construction of the reactor and turbine to Areva. The two are therefore responsible for different aspects of the project and have direct relationships with different stakeholders. TVO and its shareholders are one group discussed in the articles, and Areva with its subcontractors and suppliers is another point of view. These two groups, the demand and supply side stakeholders, have conflicting interests. This relates back to stakeholder theory by Winch (2004, 324), who suggests that managing the relationship of these two groups of stakeholders is the core of project governance. These issues relate to stakeholder salience and the relationship of the client and turnkey contractor is discussed later.

The five most common stakeholders listed by Friedman and Miles (2006) are all found in this case project. However, they look a bit different than in the context of a typical organization. The first two, shareholders and customers, are practically made of the same parties. Pohjolan Voima is the largest shareholder of TVO, through which the Finnish industry and electricity companies own the project. They are also the customers of the project, as the electricity generated by Olkiluoto 3 is for them. These two stakeholders in the division by Winch (2004, 323) are called "Client's customers" and "Sponsors". In the analysis this group is simply referred to as "shareholders" so as not to double code each one of them unnecessarily. In order to get to analyze the very end-users as customers, the code "energy consumers" was added. They are "customers of the customer" of the project. They are of course local residents, who are already identified in Winch's framework. In terms of identifying the stakeholders the new code wouldn't have been needed, but in terms of analysis it is interesting to separate whether these individuals and groups act as locals or as customers. In terms of the stakeholder groups presented by Friedman and Miles (2006), the locals -code refers then to "local communities" and "the general public", and the energy consumers -code refers to "customers" in the traditional sense. This division seems to be one that megaproject managers should make based on the project, as this division may aid in understanding the different claims the locals have on the project.

In addition to the different parties involved on the demand side of the project, and the different structures of the customers, the supply side with the contractors looks different as well. The main contractor here is the Turnkey contractor Areva. The rest are coded and considered as subcontractors, and suppliers. The employees -group is also positioned here on the supply side internal stakeholders. The framework by Winch (2004) also includes the client employees on the demand side. They were not discussed in the articles and weren't coded. It seems according to these findings that at least in this case project the client employees are not relevant as stakeholders. Through the turnkey relationship, Areva has a direct relationship with the subcontractors and their employees. These employees, who were present at the construction site and planning, were instead very crucial for the project.

A noteworthy issue is how at the beginning the project is thought to have a massive impact on Finnish labor, with most of the contracts going to Finnish companies. An article from Yle in 2003 writes about this:

> *"The degree of domestic labor may rise above 50 %. Construction industry and the Finnish subcontractors are trying to get as many contracts as possible. TVO has encouraged Finnish companies to bravely take part in the bidding."*

But Areva is in charge of picking these contractors, and as the project moves forwards the biggest gigs go to France, and more and more foreign companies and employees are introduced to the project. An Yle article from 2010 includes the following quote from the CEO of the Confederation of Finnish Construction Industries RT, the joint interest organization of construction industry contractors:

> *"At Olkiluoto 3 the degree of domesticity has been lower than expected. It is probably because there was not enough planning time."*

This shows how the contracts did not go to the Finnish companies, as there wasn't enough time for planning. Instead, foreign companies were chosen. This brought in a considerable amount of foreign labor, which caused its own issues.

The contractors, being foreign, bring a lot of foreign labor to the building site and to work around all the aspects of the project. This results in different cultures and backgrounds complicating the supply side stakeholder relationships. This complexity brought by multiple cultures is a part of the challenges that arise from the fact noted by Flyvbjerg (2014, 9), that megaprojects are multi-actor processes. Articles such as the one in Helsingin Sanomat in 2010 highlight how issues like language barriers hinder project performance. The article includes the following quotation from a STUK representative:

> *"It's clearly challenging to confirm, that the messages are delivered to the employees, and from employees to the management. It came up, that some employees, due to the language barrier, are not able to bring up safety concerns directly to their supervisors."*

Olkiluoto 3 is a good representation of why the different divisions of stakeholder groups in projects are needed. The theory by Winch (2004) is much more fitting, where the traditional stakeholder groups by Friedman and Miles (2006) are not sufficient to explain the stakeholder field.

6.2.2 The many external stakeholders

With the findings from the coding process, it is quite apparent just how many stakeholders this megaproject included, and how important they were to the project, as they gain so many mentions in the articles. Stakeholders are not only limited to the client, the turnkey contractor, and their direct business partners in the last chapter. Approaching the case with the wide stakeholder definition by Freeman (1984, 46) meant that a lot of different parties were identified as stakeholders. The stakeholders that were coded the most during

different phases of the project give directions to how the stakeholder focus shifted throughout the case project.

From the very beginning, external stakeholders were present in the project. Throughout the project timeline, external stakeholders gained more mentions in the articles than internal stakeholders. The external stakeholders in the beginning of the case project were quite obvious and easy to identify, for example the Finnish government, or the locals. However, as Winch (2004, 324) mentions, these external stakeholders may have different interests and sentiments on the project from the very start which aren't as easily identified. They do not have a positive outlook on the project by default, like the previously mentioned internal stakeholders. This calls for the management to not only identify the stakeholders but consider their positions. Stakeholders such as Greenpeace did indeed have a negative outlook on the project at the initial phase. Aaltonen and Kujala (2010, 382) also remind that in megaprojects these types of external stakeholders need to be managed, in contrast to typical projects only focusing on economically impactful stakeholders, like internal stakeholders. Judging by the articles, the project managers could have considered these environmentally and socially concerned stakeholders more through including them in statements and plans, as in the initial articles the project company representatives did not mention these external stakeholders.

And as the construction begins and moves forward, the theory from megaproject literature is proven even more to be in effect as the stakeholder field widens considerably, increasing in complexity. The stakeholders mentioned shifts even more towards the external stakeholders. The internal stakeholders are still coded throughout the project; the external ones are just coded even more. Within internal stakeholders some movement occurs as well, which is related to salience and discussed in later chapters. This increased presence of external stakeholders in the construction phase is in line with theory by Aaltonen and Kujala (2010). They theorize that the external stakeholders usually don't influence the project in the early stages, but rather seek impact on the project on later stages.

More and more different parties keep getting identified as stakeholders as the project moves forward. Some of these remain more insignificant to the project success, but some of the most important external stakeholders become vocal here, in the construction phase. This is most evident in the case of STUK. It gains only one mention in the initial articles during planning and permitting but becomes one of the most impactful stakeholders as the project moves forward and faces challenges. This highlights just how hard it is in megaprojects to identify and manage the external stakeholders as such an important player can enter only after the project has begun.

The external stakeholders and their amount and complex interests align with previous megaproject literature, as well as stakeholder theory in relation to project management. In addition to these findings, some other interesting findings from external stakeholders

was the comparisons to other megaprojects, and how they appeared as stakeholders. Flyvbjerg (2014, 9) talks about the uniqueness bias of megaprojects, and how often times they are not compared to other projects, when management sees them as so unique. The articles however compare the Olkiluoto 3 project to many others, ranging from unrelated projects like Länsimetro to other nuclear power plants like Taishan or Watts Bar. So other comparable projects do exist then, but managers ignore them. During the project, however, some comparisons were drawn even by the managers, as there was a need to compare Olkiluoto 3 to the other reactors being built with the same technology, in order to make sure the problems of the other reactors are accounted for. This is at least somewhat proactive, but as Budzier and Flyvbjerg (2013) suggest, megaprojects should learn more actively from other projects even if they include unique components, as those who only see their project as unique fail more often.

6.2.3 The Four Sublimes

Many internal and external parties had a stake in the project with varying levels of interest, but why did this project appeal to so many? One explanation to megaproject interest is the theory of four sublimes by Flyvbjerg (2014, 8). The technological, political, economic and aesthetic sublime attract different parties to megaprojects. In the studied articles many stakeholders can be identified to be driven by one or multiple of these sublimes.

The technological sublime refers to how the megaprojects are appealing due to their technological advancements (Frick 2008). Many stakeholders of Olkiluoto 3 were interested due to the fact it is the first EPR reactor. The turnkey contractor Areva obviously has a huge economic stake on the project, but another reason they took part in the OL3 project is to get to pilot their new reactor type. Other stakeholders were also excited about this technological novelty, such as the other nuclear projects. Another aspect of the technological sublime is the appeal to build superlatives. Olkiluoto 3 is a great example, as it is the largest, most powerful reactor in Europe, and the third most powerful in the world. This motivates the companies involved, as well as the locals. (Frick 2008.)

The political sublime was only present in a couple of mentions from the very beginning of the project. Some Finnish politicians gained media attention as they approved of the project.

The third sublime, the economic sublime, was more present. In the beginning, articles mentioned how attractive the project would be for the Finnish government, as it would bring huge employment effects. This economic sublime was even more significant for the municipality of Eurajoki and its residents, as they were positive the project would bring

economic benefits. This sublime also affected the owners of TVO to decide on building and financing this huge project. The industry and power companies were motivated by the huge economic gains of the finished project.

The final aesthetic sublime by Flyvbjerg (2017, 9) was not mentioned in any of the articles to be a motivation for any of the stakeholders. The aesthetics of the reactor were quite irrelevant. This is highlighted by there being no sketches or renders of the reactor in the early articles, whereas in the case of some other megaprojects there are often illustrations on what the finished project would look like. The only pictures of the project were from when the outer shell was already mostly finished.

The findings together with comparisons to stakeholder and megaproject literature give a good view of just how typical of a megaproject the studied Olkiluoto 3 case is. It has a complex stakeholder field that shifts throughout the project and was no doubt part of the reason for the project's challenges. In addition to the stakeholder parties being complex, their salience and changes in it further challenge the project management. Next chapter dives into what we can discover from the stakeholders' salience shown in the findings.

6.3 Shifting salience of megaproject stakeholders

This chapter gets to the very core of the thesis, as it examines how the stakeholders' salience that were shown in the finding's links to the theory, and how the salience and its changes can be explained. These changes come from changes within the project, as well as external factors. As Flyvbjerg (2014) argues, the changing stakeholder relations, and in this case salience, then further affects the megaproject. The project stakeholders' salience is presented and examined via examples and trends that came up in the articles the most, as some stakeholders and their salience were definitely more crucial than others to the progression of the project.

6.3.1 The power struggle of internal stakeholders

From the findings it is evident that the most coded and most discussed stakeholders are the client and the turnkey contractor. Their relationship therefore gets a lot of attention in the articles. As discussed in chapter 5.4.1 and can be seen in Figure 7, they are both definitive stakeholders. They possess all three attributes of salience. Still, even these two core stakeholders exhibit some changes in their salience, and how they are perceived to possess each attribute.

The power attribute both these parties possess is interesting. The initial setup is that TVO possesses the most power over the project, but then gives power to Areva, who will

thereon have the power over choosing and managing the subcontractors and the employees.

The relationship between TVO and Areva starts to get more serious as the construction moves forward and delays start appearing. Both parties start blaming each other for the delays. TVO blames Areva for the lack of planning and subpar construction. Areva blames TVO for not helping in getting the required permits and dealing with the government officials of Finland. Due to the turnkey contract, both parties have urgent claims on the project, that are originally legitimate. However, some of the parties' demands lack legitimacy. More importantly, neither party possesses the power to rule over one another.

As the salience theory by Mitchell, Agle and Wood (1997) shows, stakeholders can gain power from other stakeholders. The dispute between the client and the turkey contractor is escalated to the International Chamber of Commerce's (ICC) International Court of Arbitration. This dispute is ongoing for most of the construction phase. The situation significantly worsened communication within the project. Pascal Pogam, the head editor of the French newspaper *Les Echos*, interviewed in Yle article from 2014, says the following about the situation:

> *"It's hard to blame only Areva, who is now engaging in dialogue of the deaf with TVO and STUK. The parties can no longer communicate with each other. The future of the project is open, since the dispute hasn't been resolved. Areva and TVO discuss mostly through lawyers. It doesn't help things, and no one can really say, when the project will be finished and what it's final price will be."*

Thankfully, the dispute was finally settled in 2018. The ICC ruled the decisions in favor of TVO. This whole ordeal represents the complexities that can arise in megaprojects that are multicultural and carried out over long periods of time. The challenges of TVO and Areva match what the megaproject literature suggested. As Flyvbjerg (2014, 9) theorized, the long timeframe of a megaproject can prove challenging to inexperienced project managers. As the quotation from Pascal Pogam suggested, this might have been the case with Olkiluoto 3. In the same article, he also mentions that some blame Areva's problems on previous management, who made the initial decision on Olkiluoto 3 too loosely and optimistically. Flyvbjerg (2014) mentions that the change of management during a megaproject is not unusual but often results in more challenges in management. The restructuring of Areva did indeed cause concern during the project and changed how the salience of the turnkey contractor was perceived. The other problems of Areva could be seen to move Areva's urgent claims away from Olkiluoto 3. It was also uncertain for a while which company would take the responsibilities of the turnkey

contractor of Olkiluoto 3. All this uncertainty and movement shows how salience is dynamic like Mitchell, Agle and Wood (1997) suggested, and it even applies to the biggest parties of the project.

6.3.2 External power – the role of governance

In addition to the client and turnkey contractor exhibiting different levels of power, external stakeholders did so as well. One of them was already mentioned, the International Chamber of Commerce. Another external stakeholders that were perceived to possess power on the project included the European Union, and more frequently and more importantly, Säteilyturvakeskus, abbreviated as STUK. The latter became a big part of the discussions in the articles and was one of the most important stakeholders in terms of the power attribute.

Initially, STUK was absent from the articles. STUK was categorized as a dependent stakeholder possessing legitimacy and urgency. It evaluated the plans for Olkiluoto 3 and gave suggestions to the Finnish government on whether the project could be approved. It therefore possessed no direct power. As the project moved forward, STUK became the governing stakeholder that overseed the project. After the initial phase, STUK could be seen to have direct power, as when it found deficiencies for example in welds, the project companies would fix them on STUKs command, without having to consult the government for extra power. STUK could therefore be categorized as a dormant stakeholder, that moves in salience as it makes urgent and legitimate claims based on inspections made and deficiencies found, or when Olkiluoto 3 applies for different permits.

STUK could be seen as possessing more direct power over the turnkey contractor and other supply side stakeholders than TVO, which is an interesting dynamic. Based on the findings Areva seems to perceive this power, as it blames many of the delays on governance and on STUK. A theme that exists throughout the project is the challenges that arise from this relationship between the contractor and governance. The strict governance of STUK seems to “come as a surprise” to Areva, who struggle to meet the guidelines in time. This highlights the need for the turnkey contractor to have better stakeholder management that considers dynamic stakeholder salience.

6.3.3 Shift in urgency

The urgency of stakeholder claims is another dynamic attribute that needs to be considered. The findings show how the stakeholders have different levels of urgency in

the different parts of the project. For megaproject management it is important to identify who is perceived as having the most urgency at which times so that the stakeholders can be managed accordingly. STUK discussed above is an example of a stakeholder that at times is absent from the main discussions, but appears with an urgent, and even legitimate, claim that needs to be addressed.

A main trend that was discovered in the findings is the shift in focus from the demand side with the customers and shareholders, to the supply side and external stakeholders such as subcontractors, employees and energy consumers. Between these groups there was a clear shift in who were the most discussed. At the initial phase of the project the shareholders were clearly in focus. During the construction phase, subcontractors and employees were more present. At the end phase, energy consumers gained considerable number of mentions in the article. This confirms how the stakeholders and their importance can shift throughout a project even quite drastically.

This relates to urgency. At the beginning of the project the shareholders had urgent claims to get the project approved and started. They were definitive stakeholders that through their role as a sponsor had power and legitimacy, and by being customers at the same time had even more urgency, than just a normal sponsor would. During the construction phase the shareholders were quite silent, but their urgency came back at the end phase because as a customer, they needed the finished reactor to answer the new issues of energy supply and demand.

This issue of rising electricity prices meant that energy consumers began to have more urgent claims on the project as well. The external events therefore impacted the urgency of the project stakeholders.

Another unexpected external event that played a role was the situation in Ukraine. Russian annexation of Crimea and the following war massively impacted the energy sector and the energy policies of the EU. The indirect effects reached the project as well. The energy consumers mentioned above were not the only stakeholders whose salience changed. Olkiluoto 3 soon became even more important for the Finnish energy security, as imports from Russia diminished. Both the local and international government therefore became more interested.

6.3.4 Shifts in legitimacy

The final of the three attributes of salience, legitimacy, was more stable than the other two, although it too did see some movement. Stakeholder theory by Donaldson and Preston (1995) emphasizes that legitimacy is a stable attribute. For example, although stakeholders face challenges in their power, legitimacy is thought to remain stable over the project: the stakeholders either have it or they don’t. However, other stakeholders and

this case show that this stability can change in the context of a long-term megaproject. This assumption is supported by Aaltonen and Kujala (2010), whose assertion is that legitimacy in megaprojects is contested and renegotiated over time.

An example of this changing legitimacy is the NGOs, and more specifically the anti-nuclear groups such as Greenpeace that were present throughout the project timeline. Greenpeace is seen as having no legitimate claims or power. However, external events that a megaproject such as Olkiluoto 3 are subject to change this. As safety controversies and other issues arise, suddenly groups like Greenpeace can be seen to have legitimacy in their claims. In megaprojects, groups like Greenpeace often only become impactful stakeholders later in the project. Aaltonen and Kujala (2010, 392) have observed this phenomenon. From the project's managements perspective, these external stakeholders are most salient at the planning stage. This is where management gives the most attention to them. However, due to the temporary and rapid nature of project planning, often these external stakeholders don't have a chance to influence the project at that stage, when they would be the most salient.

Possible changes in legitimacy can also be seen in the dispute of TVO and Areva. At points the legitimacy of each partner's claims is under investigation. The turnkey contract and its division of responsibilities are brought into question. For example, when Areva or TVO demands compensation, it is unclear whether these claims are legitimate, and this needs to be dealt with by a third party.

7 SUMMARY

This thesis set out to investigate how stakeholders and their positions evolve over the course of a large-scale infrastructure megaproject, using the Olkiluoto 3 nuclear power plant in Finland as a case study. The research was motivated by the growing number of megaprojects being built and required in the global energy sector, the increasing complexity of these ventures, and the recognition that stakeholder dynamics play a critical role in determining project outcomes. By applying stakeholder theory and analyzing the Olkiluoto 3 project across its lifecycle, the study aimed to generate insights that could inform the management of future megaprojects.

The thesis first formed a theoretical framework through a review of megaproject literature, and the examination of stakeholder theory. Data was then collected and analyzed with an empirical qualitative study that relied on secondary data. The findings were then presented and compared with the previous literature.

A review of the literature established the defining features of megaprojects and outlined the typical challenges they face, including frequent cost overruns, delays, and the "iron law of megaprojects" (Flyvbjerg 2014, 6). The literature also highlighted why, despite these challenges, megaprojects remain attractive. A big reason are the "four sublimes" of megaproject management: Megaprojects promise economic, technological, and social benefits, and appeal to both decision-makers and the public (Flyvbjerg 2014, 8). However, the multi-actor nature of megaprojects introduces significant complexity, making stakeholder management a central concern (Flyvbjerg 2017, 3).

Stakeholder theory provided the conceptual framework for the research. The thesis defined stakeholders broadly with the definition by Freeman (1984, 46). These stakeholders were then categorized by categories inspired by the work of Friedman and Miles (2006). The position and relationship of the stakeholders was studied based on the model by Mitchell, Agle and Wood (1997) to categorize them by their power, legitimacy, and urgency. This concept of stakeholder salience was used to track how the importance and influence of different actors changed throughout the project's lifecycle.

The research method was an intensive case study on Olkiluoto 3 project. The data was gathered from three online publications, Yle, Kauppalehti and Helsingin Sanomat. The articles from these publications that discussed the project were coded to show which parties appear as stakeholders, at which points of the project, and how often they appear and in what context.

With the findings a timeline of the project could be formed. It was then divided into three phases based on the internal events and the theme of discussion in the articles. These phases are the initial, construction and end phase. Many delays were discovered, but also advancements and external events that influenced the project. The conclusion can be made that a nuclear infrastructure project such as Olkiluoto 3 follows the trends of

previous megaproject literature. The project faced delays and cost overruns. They were the result of challenges that were already known in previous literature, such as optimism and uniqueness bias, inexperienced management, and the unpreparedness for the stakeholder dynamics. The explanations for why the project was still built and supported by so many are aligned with the four sublimes of megaprojects.

The findings gathered from coding the articles reveal that the stakeholder landscape of Olkiluoto 3 was highly dynamic. Multiple different stakeholders were identified, both internal and external, with the latter being more frequently present in the articles throughout all the project phases. To categorize the stakeholders, the stakeholder categories should be molded to the project in question. The two-phase process is helpful where the stakeholders are first examined with a wide perspective and then categorized based on what was found first. The stakeholder categorization adapted from Winch (2004) proved useful in dividing turnkey project stakeholders. In the initial phase, core stakeholders included the project client Teollisuuden Voima (TVO), the turnkey contractor Areva, the Finnish government and locals, and the owners and customers of TVO. As the project moved into the construction phase, new stakeholders emerged, including international subcontractors, NGOs and additional regulatory bodies. Discussion as well as urgency moved from the demand side stakeholders towards supply side stakeholders, and external stakeholders.

The salience of the stakeholders was also very dynamic. Even the definitive core stakeholders exhibited different levels of the three attributes of power, legitimacy and urgency. The client and the turnkey contractor fought over the delays and cost overruns, and who was responsible. They made claims with differing legitimacies and looked to a third-party regulator to enforce the claims with their power. An external stakeholder, STUK, acting as a governing body, was perceived to possess a lot of power over the project. It remained in discussion from the construction phase all the way until the completion. The regulatory actions by STUK were a big source of delays and disputes, as the turnkey contractor seemed unprepared for the strict regulations, possibly due to cultural differences or inexperience.

Conclusions show that in future infrastructure megaprojects there is need to take into account the previous trends shown by the megaproject literature. The challenges of megaprojects need to be taken into account, and the megaproject needs to be managed as one, not just as a larger normal project. A critical component is understanding the stakeholder landscape, that can be of much more complexity and can change drastically throughout a project with a long scope. Not only do stakeholders enter and exit the project, but existing ones show different claims with varying legitimacy and urgency throughout the different phases of a project. Surprising parties can exhibit power to change the course of the project. With proper stakeholder analysis and continuous assessment of project stakeholders, megaproject success could be improved.

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APPENDIX

Total number of articles found by publication

Year	YLE	KL	HS
2000	0	0	6
2001	0	0	7
2002	3	0	8
2003	5	1	8
2004	2	9	9
2005	4	4	12
2006	5	3	13
2007	14	3	19
2008	28	3	22
2009	65	7	26
2010	85	4	39
2011	59	3	24
2012	54	2	30
2013	32	6	17
2014	68	5	50
2015	31	11	27
2016	36	14	26
2017	37	12	18
2018	33	15	14
2019	24	17	13
2020	21	13	9
2021	31	15	37
2022	183	50	132
2023	90	23	48
TOTAL	910	220	614